

Exley On Mix

Text by Michael Menduno
Photos by courtesy of Michael Menduno and Ann Krislovich

Prologue: I first spoke with Sheck Exley in the summer of 1991. I had begun publishing *aquaCORPS: The Journal for Technical Diving*, a year earlier and I was working out of the office at Capt. Billy Dean's dive shop in Key West, Florida, the first technical diving training center in the United States. "Technical diving", a term we had just coined to describe this new style of diving, was just in its infancy.

Billy was out running errands and Chris, the store manager, called out for me pick-up the phone in the office: someone was interested in our deep diving program. "Hello, my name is Michael. May I help you?" I said.

"I'm interested in your deep diving program and diving the *USS Wilkes-Barre*," said the caller with a distinct southern drawl.

"Do you have any deep diving experience?" I asked.

"Some," said the caller.

"What's your name," I queried.

"Exley."

"Sheck???"

Later that fall, Sheck and his partner Mary Ellen Eckhoff visited Key West to dive the *Wilkes-Barre*, a 610-foot U.S. Navy Cleveland-class light cruiser sunk in 1971 in 250-foot of water, which served as one of our training sites. We stowed our gear on board the *Key West Diver One* and motored 45 minutes out to the wreck.

Billy stayed on board and I dove the wreck with Mary Ellen. Sheck decided to make the dive by himself shadowed by one of our support divers. We planned a 20-min exposure to 250 followed by approximately an hour of decompression. Mary Ellen and I surfaced, while Sheck was still on the decompression line with a support diver. In the distance, we noticed that there was a large cargo ship bearing down on us

on a collision course. Billy repeatedly tried to raise the ship on the radio warning them that we had divers in the water. To no avail—the freighter never responded. As it drew closer with no signs of changing course, Billy decided that we had to move the boat though we still had divers on the line. We sent a support diver down to Sheck who was decompressing at something like 60-feet, to tell him to hang on, we were moving the boat to avoid a collision. It took Billy about five minutes to maneuver out of the way of the freighter which blew its whistle at us as it went past.

Forty minutes or so later, Sheck sheepishly climbed back on board. The freighter, which had passed us, was still visible in the distance. Sheck asked if this sort of thing happened often. Billy replied it was not uncommon. Sheck, who acknowledged he was not too comfortable on boats, said that he was going to stick to cave diving after that.

Later that fall, I interviewed Sheck for the magazine. Here is a reprint of the original interview, which appeared in *aquaCORPS*

Journal, #3, MIX, published in January 1992. Two years later on 6 April 1994, Sheck drowned during a failed attempt to bottom out the Zacatón cave system in Mexico, which was more than 300 meters deep.

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I glanced over at Sheck. He was again lost in thought, staring blankly into the night. It had been fascinating listening to him discuss the facts and figures of the dive, but what I really wanted to hear about were the things that go on inside his head when he's buried under hundreds of feet of water, inside a rock crevice, on the very edge of life, and still going on.

"How are you going to decide when you have gone deep enough?" I asked.

"Fear," Sheck answered immediately as if he had been patiently waiting for such a question."

—from *The Deepest Dive*
by Ned Deloach



To say that Sheck Exley is not your average 42-year-old high school algebra teacher is a bit more than understatement. By vocation, he is in fact a teacher at Suwannee High School in Live Oak, Florida. By avocation he is an explorer, pioneer, educator and diving legend.

Certified in scuba at the age of 16, Exley became the first person to log a thousand cave dives accomplishing this feat in less than seven years. Over the nearly two and a half decades that followed, Exley explored and surveyed most of the world's known deep water cave systems,

ANN KRISLOVICH



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pioneered many of the methods and techniques of deep air and special mix scuba, and in doing so, has repeatedly redefined the limits of self-contained diving.

His exploits and verve have earned him the reputation of being one of the finest divers in the world, and have shaped the development modern cave diving, which is regarded by many as a model for specialized dive training. A teacher and soft-spoken educator, Exley helped to establish the National Speleological Society's Cave Diving Division (NSS-CDS) in

1973, has published over 100 articles and six books on the subject of his passion, lectures extensively, and currently offers a mixed gas training program for experienced divers.

Perhaps pioneers like Exley will always remain an enigma. An explorer and athlete of the highest magnitude, combining physical ability with the psychological stamina necessary to venture where few will ever go, to others, perhaps, he is seen as a daredevil and risk taker seeking a thrill.

Recently aquaCORPS caught up with Exley hoping to try and explain and reconcile the many stories that have grown up around the man, to understand his motivation, to get inside his head. The results were more than we had anticipated.

MM: When did you start diving Sheck?

SE: I got started in 1965 but I didn't really start keeping a log until February 1966 when I went on my checkout dive with Ken Brock. He taught me how to dive. That first dive we went down and I stuck my head under a coral ledge, what you might call a coral cave, maybe 16 feet deep [chuckles]. Wasn't much of anything, and I really didn't enjoy it. But then Ken took me to Crystal River and I really got turned on. I didn't have a light or anything so I kind of wandered off into the cavern there, my

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eyes adjusted and I swam a little bit further, peering off into the darkness. I guess I've been peering off into that darkness ever since.

MM: You've made some incredible dives in your career; your "Salute the Flag" dive at Diepolder II to 360 feet on air, Wakulla, El Nacimiento de Rio Mante to 870 feet, your 10,939 foot penetration at Cathedral, why do you do what you do?

SE: I'm not sure. My motivation has changed a lot over the years. I grew up diving, and as a teenager I wanted to be important and to be thought of as important. I went through a stage where I wanted to see how deep I could go. Then I went through a stage to see how far I could go. I still enjoy that.

There are places that no one else has been to since the dawn of time. We can't see what's there. We can see what's on the dark side of the moon or what's on Mars, but you can't see what's in the back of a cave unless you go there. There's a special feeling when you know no one else has been there before. And it's an extra special feeling when you know no one has ever been that far. I enjoy that feeling.

MM: Your Nacimiento Mante dive must have been like that?

SE: It was frightening. I'd use the term "physiological roulette" to describe my four Mante dives. The first to 520 feet in 1987 was probably the most frightening. It was really stepping out into no-man's land as far as the western hemisphere was concerned. Jochen Hassenmayer of course had been deeper at Fontaine-de-Vaucluse.

MM: Was Mante your first big mix dive?



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SE: I had done practice dives of course: 130 feet at Cathedral and 260 feet at Holton Springs. Dale Sweet's 360 feet trimix dive at Diepolder back in 1981 was the only dive in the western hemisphere that was close to it. In the eastern hemisphere, there were Jochen's dives. He had been to 660 feet, which gave me a lot of confidence.

MM: You knew it was doable?

SE: I knew it was doable. I had dived with Jochen. He's an extremely impressive diver, as good as any I have dived with. The fact that I had actually met the man and dived with him made me feel a bit more confident. Decompression tables were a problem of course. There was nothing available. I had never heard of Bill Hamilton at the time. Fortunately I was able to get a hold of some commercial tables that Jim Melton got for me as a model.

MM: You used commercial tables?

SE: No, I had to extrapolate them; the tables stopped at 400 feet. I had to take the model and extrapolate beyond that. I did the same thing on the 660 feet dive two months later.

MM: You know a lot of people would say, "Sheck is nuts." Why would he construct his own



decompression tables; isn't that just foolhardy and crazy?

SE: Isn't that basically what everyone does?

MM: Ha! Good point.

SE: I may not be the world's greatest mathematician, but mathematics is my profession and I have a degree in computers; both of them lend themselves quite well to figuring out a decompression schedule. I'm sure Bill Hamilton wouldn't do it quite the way I did. But then I did have a vested interest in doing a good job.

MM: You were the one on the line.

SE: I wouldn't begin to say that I could construct better decompression tables than Bill Hamilton, Angel Soto or Randy Bohrer, all of who later worked with me. I don't

have the information to make that statement. But it was all I had to work with at the time.

MM: There's a myth out there—a subtle one, but it's still there—that decompression tables represent some kind of truth, as opposed to what they are: people's guesses as to what will work based on experience.

SE: That's exactly right. I tell people early on in my mixed gas course that it's important to realize that any decompression table is just a mathematical model based on poorly understood physiological phenomena. The degree that the model is valid for a given exposure is the degree to which you do or you don't get bent. A lot of the early models were very simple, like a kid with building blocks—not much to them. Of course, they've become more sophisticated now, but their



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success still depends on whether or not they work.

MM: Have you ever been bent?

SE: Never. Well, sometimes when I'm wearing a dry suit and woolen underwear, I've surfaced with what may have been skin bends, but I don't know. I've never had

anything other than skin bends. It's a combination of a lot of luck, probably some unique physiology when I was younger, and a lot of conservatism as I get older. Fear.

MM: The decompression times you pulled on your Mante dives are so amazing, ten hours plus for your 780 foot jump and more on your last one to 870 feet.

SE: [Exley pulls out his log] My 520-foot dive required seven hours and 30 minutes of decompression for a 15-minute bottom time. Two months later, the 660-foot dive for 24 minutes took 11 hours and 13 minutes. The following year I made my dive to 780 feet using Bill's tables, which were only 10 hours and 43 minutes for a 24-minute bottom time. Besides the fact I was more confident in the safety factor in his tables, he got me out of the water quicker. My most recent dive to 870 feet for 23 minutes had a decompression of 13 hours and 30 minutes.

MM: How do you prepare for decompression like that? It must have physically and mentally grueling?

SE: From the standpoint of getting my tissues prepared, Bill Hamilton suggested that I make a deep dive, but not too extensive, the day before just to get my tissues limbered up. That worked out real well with my plans

because my profile called for me to stage three bottles of decompression gas at 330 feet. We didn't want to do any mix dives before the big one because of the possibility of getting bent which would mess up the whole expedition, so I did the dive on air and got my tissues ready.

As far as being psychologically ready for the tedium of the thing, I was just coming off a record penetration at Chip's Hole near Tallahassee, Florida, for 10, 444 feet, which was the longest dive I ever made—14 hours in 69 degree water with a wetsuit.

MM: You survived!

SE: What made it worse was that I was in a current the whole time. I got cold. Fortunately the chemical heaters I was using kept me alive. After that, decompression at Mante, in 78-degree water seemed pretty easy as far as time went. As you know, with helium mixes I was making about 50 odd stops all of them relatively short. The time passed very quickly and I had plenty to keep me busy including wondering if all the little twitches were going to be bends, CNS toxicity, or just my old bones getting tired.

MM: You did it in a wetsuit?

SE: No, in a drysuit.

MM: Diapers or a catheter?

SE: No, I just cut it loose. Those are the only dives I use that drysuit for. And I enjoy having the back-up buoyancy compensation the dry suit provides. I sure wouldn't want to be down at 900 feet without buoyancy.

MM: Are you scared or anxious before your big dives?

SE: Up until the time I get in the water, I'm scared. I'm sure I get as scared as any diver there was. In fact, I got so scared the night before my Mante dive—I'm not sure what caused it—I actually became physically ill. I don't know whether it was a short little bug or what. The way I control it is through meditation. I meditate for ten minutes back in the cave before I start down; that clears my head of all that stuff.

MM: When you were in the water did you think about all the things that could go wrong or do you just deal with things as they happen?

SE: I spent roughly nine months in preparation for my last dive at Mante, in addition to my previous dives there. You play "what if " and try to think of every possible thing that could go wrong, and figure out all the little variations. You make plans and redundant plans to handle those things, and rehearse, rehearse, rehearse. And then when you make the dive, it's all business. Your mind is totally occupied with everything that has to happen. A lot of it has to happen very quickly. It's mental conditioning. I wouldn't be alive today if it wasn't for that.

MM: I heard that your watch went dead during one of your deep decompression stops?

SE: It was the 520-foot dive and it didn't stop; I lost my watch on the dive and I wound up counting all my deeper stops from 260 feet in my head. Fortunately, I've known CPR since I was 16, so that second, "one-one-thousand, two-one-thousand, three-one-thou-



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sand..." is ingrained in my memory; but when your talking about a 30-minute stop, you're counting on your fingers. Eventually my safety diver, Mary Ellen Eckoff, who's probably one of the best cave divers in the world, and by far the best female, came to check on me at my 80-foot stop and brought me a watch.

MM: Let me ask you the obvious question; why weren't you wearing a back up?

SE: It was dumb on my part. After that, I carried three watches on each dive, and I had another one waiting for me at 520 feet with an additional depth gauge. Back up, back up, back up!

MM: What about the cave itself?

SE: It's real involved. What helps is having gone there before. I don't think anyone's going to down and add to my line anytime soon, although it's only a matter of time before someone goes out there





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you'd like. That's where you have to hang your decompression tanks. The passages are very narrow; some of them too narrow to go through. If you drop anything it's gone and you have to plan your gas carefully.

I try to design everything around the thirds rule. I overestimate my breathing rate at all levels and provided a third cushion based on the deepest possible dive profile/ diving time combination I thought I'd get. I also design my mixtures to stay within the oxygen toxicity envelope, both CNS and "whole body",

and does it. It would be very difficult however for someone who's never been there before to jump in the water at Mante and go to the bottom. You really have to build up to it. And then there are a lot of intricacies. For example, the cave is not really designed for decompression. You have a strong current blasting upwards and very jagged sharp ledges, but not as many as

raising the oxygen and nitrogen levels as I go up. Generally I try to run my nitrogen levels as high as tolerable, and switch over at 280 feet from air to deep mix on the way down, and from deep mix to air on the way up. I used two deep mixes this last time, 13 mixes in all. And I do a lot of other things as well. I worry about diet before the dive and during the dive.

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MM: How about your support team?

SE: I had lots of help. Jochen shared some information. Dale Sweet shared everything he knew and supported me with equipment. Paul De Loach, my regular diving partner, maybe the best cave diver we have, helped me; Mary Ellen Eckoff, Tom Morris, Paul Smith, Paul Heinerth, Mexico's top two divers, Sergio Zambrano, and Angel Soto, who headed up my support teams, Randy Bohrer, and of course Bill Hamilton, the list just goes on and on.

MM: You know there's an old joke running around. People ask me all the time, "What kind of regulators did Sheck use on his Mante dives?" Answer: Every one he could get his hands on. Obviously rigging 30 some cylinders took a fair bit of equipment, not to mention gas. Did you have any sponsors?

SE: Early in my career, I guess it was around December 1970, I was involved as a safety diver in a record deep air dive attempt down in the Bahamas. There was a lot of those going on at the time—sponsorships, calling in the news media, getting official Bahamian folks to come and witness the thing, all that kind of stuff. It put a lot of pressure on the divers. As a result of the pressure, two divers never came up. That's when I made my famous air dive to 465 feet, which almost cost me my life. I couldn't reach them and nobody else could either. They knew going into the dive that their profile was not ideal. There were safety factors that they had counted on that were compromised at the last minute under the pressure from the sponsorship, the media and this

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whole expedition scenario. They compromised their safety procedures and died as a result.

I never want to be in that situation. That's why I keep my involvement small. I don't want a lot of big sponsors. I don't want a lot of divers around. Those that are involved are close friends and I tell them up front, "We might just be going to Mexico for a long drive, turn around and come back. If I'm sick, or just don't feel right, or if a light goes out at the wrong time, whatever, the dive's over."

MM: I understand you were nervous about getting involved with mix in the beginning.

SE: My best friend back in the early 70's was probably Lewis Holtzendorf. Gosh, he was one of the best we had back in the early and mid-70's. Lewis made a mixed gas dive at Wakulla with Court Smith. They were diving heliox, and using the U.S. Navy helium/oxygen tables, which called for the use of pure O₂ at 50 feet. We know now, that was asinine, but back then they thought the profile was safe, and discussed it with one of the Navy people at the Experimental Dive Unit (EDU). As it turned out, Lewis convulsed and died. His partner almost did, too. That was 1975.

There were other incidents. Hal Watts had tried to do a body recovery in an open sink in Orlando on heliox and got severely bent in the process. After that, Frank Fogarty, Terry Moore and Rodger Miller made a 325-foot run in a Missouri sink, in 1978,

on trimix and got severely hypothermic. We were all looking and thinking, my God, what's going on. You have to understand, the world depth record for cave diving was only 340 feet back in 1977 and it stayed that way until Sweet made his successful trimix dive at Diepolder in 1980. It was Jochen's dives that got me thinking that mixed gas might be done safely.

MM: Sheck, you've done a lot of deep air diving over the course of your career; you've mentioned quite a few deep air dives over the last half hour. What are the practical limits of air?

SE: You have to understand, I've built up a lot of experience and tolerance to nitrogen over the last 25 years, and what works for me might not work for everyone. In the early days air was all we had and we didn't have the knowledge we had today. If I were starting again, I'd probably do things a lot different.

Today, I think you have to look at each individual environment and application and judge it on that basis. There are quite a few people who are teaching deep air technique these days. I know Hal Watts, Tom Mount and I do and there are others. With those techniques, basically anyone can be taught to dive to 200 feet. Beyond that it becomes an individual thing.

Nowadays, the only rational recommendation is to build yourself up to where you can do your air dives to 200 feet; than after 200 do your helium diving. There's no longer any point to build ourselves up to 300-

foot dives on air, because most people can't possibly handle it to that extent; it's just one of those individual things. Trying to build up beyond 200 feet, you're taking chances. Maybe you can handle it, maybe you can't.

MM: Physiological roulette?

SE: Exactly. I was one of the lucky ones, or perhaps, unlucky ones.

MM: Is air technology dead?

SE: I don't think so. I think there will always be a use for air. Hal Watts really got the deeper air stuff started from the viewpoint of trying to acclimate to higher partial pressures of nitrogen, but as we continue to learn more, like some of the amazing stuff Bret Gilliam's doing, it will make it easier for the rest of us to dive to 200 feet, maybe more. Let's face it: we have a lot of experience with air and we're more comfortable with the decompression. I'm not aware of any helium tables that are as reliable as some of the air tables that are available. The decompression is more reasonable and you can decompress closer to the surface. If you can do a dive on air, or an appropriate enriched air mix, and do it safely, you ought to do it.

MM: What about people going deeper?

SE: It's obvious that there's an enormous amount of interest that has been generated, particularly now with the advent of mix gas diving. Back in the 60's and 70's we used to try as instructors to tell everyone there's not much to see beyond 130 feet. Of course it depends on what you're inter-

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ested in seeing. We've all known from the beginning of cave diving in Florida, that the most beautiful and interesting caves are all deeper than 130 feet. It's sad. You know we tell people, "Don't go below 130," and then we turn right around and do it ourselves. All cave diving instructors dive deeper than 130 feet.

I think it's more realistic to try to establish some guidelines for peo-

ple who want to venture deeper, rather than say "Don't" and be seen as hypocrites. Otherwise people will begin to think, "Well, if that rule isn't worth paying attention to, maybe they all aren't."

MM: Deep diving is getting more expensive. Do you think that will limit people?





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SE: Diving is a much more expensive pursuit now than it's ever been. And when the rebreathers start coming out—Bill Stone's probably real close to having a fully redundant closed circuit system now—it's going to be even more expensive. Quite frankly, the people who want to do these dives are going to find the money to do them. I remember when scooters first came out. Shoot, I didn't have any money. But I realized if I wanted to continue to do the type of diving I wanted to do, I had to step up, borrow the money and buy one. I did. Bill Stone once made the observation that he wasn't aware of any explorers that died rich.

MM: *What does it take to be a cave explorer?*

SE: You have to love it. You have to love the diving. Loving recognition is not enough. That wears off. That's why you see such a high instructor dropout rate. The ones that got in it because it's another merit badge and everyone around thought it was a big deal—it wears off. You see it over and over again in diving. When I got started in diving back in the 60's, I wanted to be special. I grew out of that and got to where I just loved diving, and that's what kept me going. If I hadn't I would have quit a long time ago.



MM: *Love. Perhaps that really is the key to it all. What's your advice for people who want to expand their diving capabilities?*

SE: Don't forget the basics. Make sure you have plenty of gas, make sure you know the way back, and make damn sure if you're going into nitrogen land or helium land, you know what you're doing.

MM: *How about you? Who do you look to for inspiration?*

SE: There's a book by Roland Huntford called, *The Last Place On Earth*, which contrasts the exploration styles of Robert Falcon Scott and Roland Amundsen in their drive to reach the South Pole. Scott was the guy with all the money, recognition, power and supplies, which he arrogantly

threw at the problem. Amundsen was poor and didn't have much, but he carefully thought out everything, every little step of the way with infinite preparation. He listened to everyone for advice, even the Eskimos who Scott thought were ignorant savages who couldn't possibly have any ideas. The end result was that Amundsen got to the South Pole first and Scott wound up killing himself and a lot of other people. I think Amundsen provides a tremendous role model for explorers and divers.

MM: *What are your diving plans Sheck?*

SE: I have a cave real close to me here on my property. In fact, it's under my feet as we talk. The last time I went diving there I was over two miles underground and the thing was still 50 feet wide and 20 feet high and going strong. No telling how far it goes. I haven't seen that anywhere else. All these other Florida caves start branching out, getting smaller; this one just keeps on going and going and going. I'd like to see what's back there, but I'm not sure I'll be able to do it with the technology we have right now. A lot of our technology may be obsolete here in a short while.

MM: *I guess you're going to have to borrow some more money and plunk it down on one of Stone's rebreathers.*

SE: And then there's hydrogen. From what I've

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been learned there seems to be some real potential for hydroliox [an oxygen, helium, hydrogen mix] though no one has looked at its use for deep bounce dives. With the kind of compression rates I was dealing with at Mante, you need the heavy nitrogen to avoid HPNS, but I'd rather have the hydrogen.

MM: *What about Mante? Are you planning to dive any deeper?*

SE: I've had opportunities to go deeper, but it looks real unlikely with my advancing age that I'll go back down there. I'd like to see more people go as deep as I've been in Mante before I go too much further. Since Jochen got the bends so bad he had to quit diving, there is no one else who's been beyond 500 feet.

You know it's funny, on my last two Mante dives, my first decompression stops were at 520 feet. Only one other person had ever been that deep and here I was making a decompression stop. How crazy can I be? I'd like to see Jim King and some of the others start diving to 500 feet, then I'd feel better about going a little deeper.

MM: *Five hundred feet, a thousand feet? That's pretty heady stuff. What do you think the ultimate limit will be?*

SE: There is no limit. We'll always find a way to go deeper and deeper. That's been the pattern all along. Ten years from now, 20 years from now, people will be doing things we've never dreamed of. And I see no reason for it to change.



Writer, diver and technologist Michael Menduno has written about science, technology and diving for *Alert Diver*, *DIVER*, *Newsweek*, *Scientific American*, *Outside* and *WIRED* magazines. He was also the founder, and editor-in-chief of *aquaCORPS: The Journal for Technical Diving*

(1990-1996), which helped usher tech diving into the mainstream of sports diving, and coined the term "technical diving." Menduno recently completed his *GUE Fundamentals* and is based in Berkeley, California, USA. He can be reached at: michael@menduno.com. ■





Point & Shoot

Step-By-Step Images With Today's Gear

Text by Larry Cohen. Photos by Larry Cohen and Olga Torrey

In order to create images with point-and-shoot digital cameras that are a step above snap-shots, we have to use the same techniques used with DSLR cameras. By using a few different techniques, one can get outstanding results no matter what size camera is used.

Get close wide-angle

This is the most important rule in underwater photography. When you think you are too close, get closer. Water is denser than air, and even the clearest water has particles floating in it. So, the less water we put between our lens and our subject the better. It is best to never be more than two feet (0.6m) from the subject. The closer one is to the subject the better the images.

So, how does a photographer fit a large underwater scene in the frame? He or she needs to use the widest lens possible. Most point-and-shoot cameras have lenses around 28mm to 24mm. Since everything looks 25 percent larger and closer underwater, this is not wide enough. Photographers need housings that allow them to use accessory lenses.

Many point-and-shoot housings have 67mm or 46mm filter threads on the lens port. So, by using an auxiliary wide-angle lens, photographers can move in close and still photograph a large area. Wide-angle lenses are impractical on some camera



Olga Torrey on *Carbisea* shipwreck in North Carolina with Olympus XZ-1 in Olympus PT-050 housing, Dual Sea & Sea YS-01 strobes, Beneath The Surface tray and arms, Olympus PTWC-01 100 degree wide-angle lens





photo & video



housing rigs due to vignetting. These rigs make use of auxiliary domes. The dome corrects for the size distortion that happens underwater. This way the camera will have the same angle of view underwater as it does on the surface.

In most cases, this equipment will not have an angle of view as wide as a DSLR with a prime wide-angle or fisheye lens. The trick here is that one has to pick subjects to match the lens. If one concentrates on smaller subjects and scenes, one will get better results.

Get close macro

Small subjects are much easier to photograph with a point-and-shoot

camera. All point-and-shoot cameras have a macro mode, so one can move in and document all the tiny creatures on the reef. If the housing allows one to attach accessories, a close-up lens could be helpful with really tiny subjects. It is best to be four to eight inches (10-20cm) away from the subject. This way one has room for lighting and is less likely to frighten the subject.

When working close, depth of field has to be considered. Because point-and-shoot cameras have lenses with very short focal lengths, photographers usually are able to keep the whole subject in focus. If a photographer has aperture control, he or she will want to stop

The author on a small wreck in Dutch Springs. Photo by Olga Torrey. Shot with the Olympus XZ-1, in the PT-050 housing with Sea & Sea YS-01 strobes

the lens down to keep everything sharp. Most of these cameras will only stop down to f/8.

Shoot RAW

RAW files are uncompressed files that capture more color tones. When working with RAW files, photographers will be able to make better corrections including color in post-production. Since these files are larger than compressed jpeg's, many point-and-shoot cameras are slow when shooting RAW. So, photographers have to decide if having more control is worth losing the speed.

Correcting color in available light

As one goes deeper underwater, one loses the warm colors in the spectrum. Warm salt water acts as a blue filter over the lens, while cold and fresh water acts like a green filter. Using the

camera's custom white balance setting along with adding filters can bring back the subject's natural color. This is usually effective in water no deeper than 80 feet (25m).

Many housing manufactures make either screw-on or push-on filters for both blue and green water. Magic filters are gel type filters that are easy to cut. They can be cut to size and placed inside the housing in front of the lens.

When using a filter, it is important to make sure that one is not using any artificial light. So, don't forget to turn off the camera's built-in flash.

Many point-and-shoot cameras have an underwater white balance. This sets

Point & Shoot

up a digital blue water filter. Aquarium mode can be used as a digital green water filter. Not all water has the same colorcast. The color will also change with how deep you are and the time of day. So, these filters and underwater modes will give images a general but not perfect color correction. As a quick easy fix, underwater mode is effective.

All digital cameras have a custom white balance feature. By pointing the camera at a neutral colored object, capturing color data, the camera will correct the colorcast caused by the lighting and environment. This is a more accurate method of correcting color, but takes more skill than adding a filter. It is important to fill the entire frame with the object and not to cast a shadow. Putting neutral colored duct tape on a fin makes for a convenient target. One can also use a large slate. Using a custom white balance and a physical filter together will give us the best available light color.

When photographers use filtering and



Duct tape on a fin makes a good target for doing a custom white balance



cinema of dreams



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photo & video

The author, Larry Cohen, on the *Carbisea* shipwreck in North Carolina. Olga Torrey took this photo with the Olympus XZ-1 in the Olympus PT-050 housing

white balance techniques, they are correcting the background and the subject. So the backgrounds in these images will not have the same vibrant blue or green color one gets when using strobes. The exposure value of the background and the subject will be close. This will flatten out images, and they will have less contrast. These available light techniques are suited to certain subjects, including wreck scenes and are effective in less than stellar visibility.

Using strobes

Another effective way to bring back natural color is to use a color corrected light close to the subject. For still images, strobes (flash) are the best solution. Strobes have other advantages besides color. A photographer can work in very low light, letting subjects be illuminated by just the strobe light, or he or she can balance the available light to get vibrant backgrounds and create

dramatic images.

In the past, SLR housings would fire the strobes with a hard wired sync cord system. On the outside, a sync cord connects the strobe to the housing's bulkhead. On the inside of the housing, there is a connection from the camera's hot shoe to the bulkhead. Most point-and-shoot cameras don't have a hot shoe, but typically they do have a built-in flash.

So, firing the external strobes with a slave sensor is the solution. On some strobes, a slave sensor has to be added to where the sync cord would plug into. Other strobes have built-in slaves. In some systems, the slave sensor is exposed, and a reflector is used to block the light from the built-in flash from hitting the subject and redirecting the light to the slave.

Other strobes have the slave set back, and one needs to connect a



Hot shoe connection inside housing

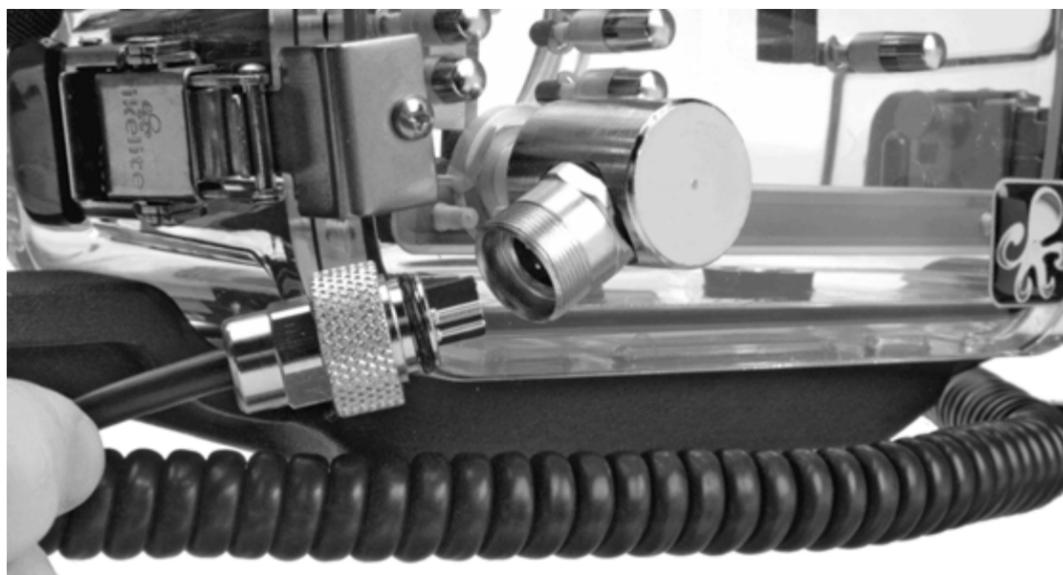
fiber optic cable to move the light from the camera's built-in flash to the slave on the external strobe. Using fiber optic cables has become the preferred method on point-and-shoot camera rigs. There are a few point-and-shoot housings that use a sync cord, but even if the camera has a hot shoe, many housings just use fiber optics. Using fiber optics has proven to be much more reliable than sync cord systems. Today, high-end DSLR housings have fiber optic cable ports if the camera has a built-in flash.

When working with strobes it is best to use the camera in manual exposure mode. When the f-stop is changed, it will affect both the strobe and the available light exposure. So, it is best to pick an f-stop and keep it constant. Changing the shutter speed will have a greater affect on the available light exposure. By controlling the shutter speed one can lighten or darken the background. Changing the power on the strobe will affect the strobe exposure, having an affect only on the subject.

This is why having a strobe with a power dial is best. Use an f-stop that allows you to have the strobe dial in the middle of the dial, when the subject is about one foot (30cm) away. This way if you move closer, the dial gets turned down. If you move farther away, the dial gets turned up.

Pick a shutter speed that has the cameras light meter reading around one and half stops underexposed. This will produce a dark background, but it will still have color. If a lighter background is desired, use a slower shutter speed. For a darker background, use a faster shutter speed. By doing this, one can create images that have contrast and separation between the subject and background.

It is best to start every dive photographing



Sync cord connecting into housings bulkhead

DivePhotoGuide.com

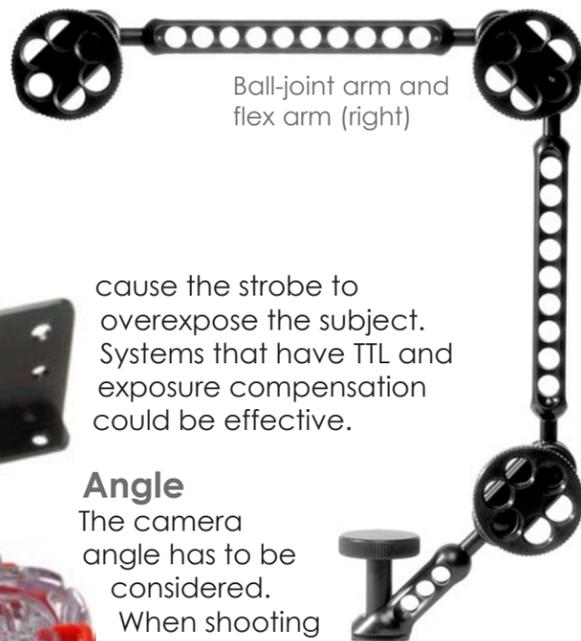
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photo & video



Ball-joint arm and flex arm (right)

cause the strobe to overexpose the subject. Systems that have TTL and exposure compensation could be effective.

Angle

The camera angle has to be considered. When shooting upwards underwater, backgrounds will appear lighter. Subjects will also look bigger and more majestic. Shooting eye level will produce darker backgrounds. If shooting downward, the background will be closer to the subject and will be textured.

Last but not least, one needs to pay attention to the strobe angle. As a starting point the strobe should be out to the side at a 45-degree angle. From this point, the strobe can be moved further to the side to show texture in the subject. For some subjects, top lighting may be more effective.

Since everything looks closer underwater, a common mistake is to aim the strobe where one thinks the subject is, instead of where it really is. When this happens, the strobe will be lighting the water in front of the subject. This lights up all the particles in the water, enhancing backscatter when one is trying to minimize it.

In order to position the strobe where desired, an arm system is used. All point-and-shoot housings have a 1/4"-20 socket on the bottom. One can use this socket to attach a tray to the housing. The tray can be used to attach a number of different kinds of strobe arms. Ball joint



arms allow the most flexibility in postponing strobes. These systems do get expensive and are used primarily with DSLR systems. Flex arms are reasonably priced and are easier to adjust. Most photographers that use point-and-shoot rigs go with a flex arm.

Once you've got your point-and-shoot camera in a housing with strobes attached to an arm system, it's time to get wet. Digital photography allows us to see our images instantly, so experiment and take chances. Look at the image, adjust and shoot again. Photographers are no longer limited to 36 frames on a roll of film. So, go out and shoot and shoot some more. The more photos we take the better we will get. Have fun, and bring back images that tell a story and show non-diving friends why we spend so much time underwater.

Today's gear

The lifespan of today's digital camera is very short, as new models come out daily. Let's talk about camera models, housings and accessories that are available today, which allow photographers to capture images underwater. By no means is this a complete list.

Nikon COOLPIX P7100

The Nikon COOLPIX P7100 has all the features we look for in a camera to use

The author inside the helicopter at Dutch Springs. Photo by Olga Torrey. Shot with the Olympus XZ-1, in the PT-050 housing with Sea & Sea YS-01 strobes

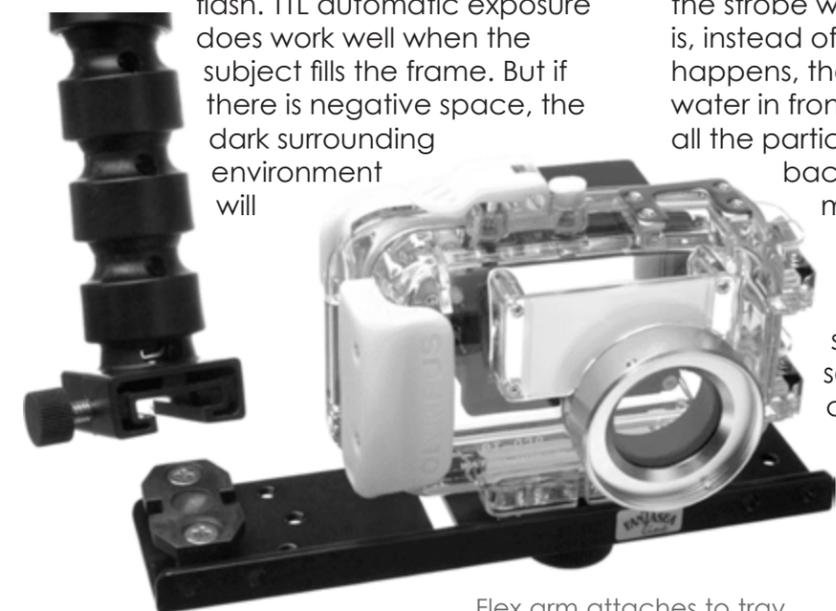


Tray attaches to the bottom of the housing

a stationary subject. This way photographers can get settings for the current conditions.

Some point-and-shoot housings that use a sync cord support TTL (through the lens) automatic exposure control with certain strobes. In recent years, a few fiber optic housing/strobe combinations will support what is being called D-TTL. In this system, the external strobe mimics the auto setting of the camera's built-in

flash. TTL automatic exposure does work well when the subject fills the frame. But if there is negative space, the dark surrounding environment will



Flex arm attaches to tray

underwater. The camera has a 1/1.7 CCD sensor with an effective 10.1 megapixels. Having a sensor larger than most point-and-shoot cameras, and having fewer pixels, means the pixels are larger. So, image quality is better, especially in low light and when using high ISOs. The camera can capture RAW files and has complete manual controls. It also captures 720p HD video, and the manual control and optical zoom does work during video capture. One very cool feature is that when doing a custom white balance, the camera auto-

atically zooms to a 200mm equivalent. So even if the target is a few feet away, it fills the frame.

Fantasea Line FP7100 Housing

This housing for the Nikon COOLPIX P7100 is very compact and allows access to all controls. The controls are marked just like the controls on the camera. It has a double o-ring seal and is rated to 200ft (60m). The housing features dual fiber optic cable ports. The ports are designed for Sea & Sea style cables, and adapters for Inon style cables are included. There is an accessory shoe above the lens port



Nikon COOLPIX P7100



Fantasea Line FP7100 housing for the Nikon COOLPIX P7100

for a focus light. Fantasea has a number of accessories to enhance the images captured with this housing.

Fantasea Line BigEye Wide-Angle Lens

The Fantasea Line BigEye Wide-Angle Lens is not really a wide-angle lens. It is an auxiliary dome. This optic corrects the 25 percent size distortion that happens underwater. So, the P7100's 28mm equivalent lens will have the same angle of view underwater as it does on land. When using dual strobes, flair could be a problem with this dome. It does have a built-in dome shade. It is important to turn the shade to reduce the flair from both the sun and the strobes. At this time Fantasea Line is testing a dome with better anti-flair coatings. This should reduce the problem significantly. Fantasea Line also produces these domes for many Canon, Sony and FujiFilm housings. They also manufacture them with a 67mm and 46mm filter thread.



Fantasea Line BigEye Wide-Angle Lens

Fantasea Line SharpEye M67

The Nikon COOLPIX P7100 does focus down to 0.79 inches (2cm) in macro mode. But, in order to have some room for lighting and to not scare skittish subjects, a macro lens could be handy. Fantasea Line SharpEye M67 UW Macro Lens will allow the photographer to get some distance from the subject but still

have the magnification.

The SharpEye has a 67mm filter thread. Since the port on the FP7100 is not round we need the EyeDaptor FP7000 - F67 in order to add this or any other macro lens with a 67mm thread to the housing.

Fantasea Line RedEye and PinkEye

The best way to bring back natural color underwater is to bring a white light source close to the subject, but in water no deeper than 60ft (18m) a filter could be effective. For blue water, Fantasea has the RedEye Filter; for green water, they have the PinkEye. Fantasea produces these filters for a number of different housings and filter threads. The filters for the FP7100 housing come with a holder that snaps onto the housings lens port. A very nice feature is the filter can be removed from the holder and slipped into a filter pocket on the BigEye dome.

Ikelite's housing for the P7100

Ikelite takes a different approach to manufacturing housings. They have a few different size polycarbonate boxes. They then take the box the camera fits best and creates the controls for that camera model. With this method of manufacturing, Ikelite can produce new



Ikelite housing for the Nikon COOLPIX P7100

housings faster than any other company. All Ikelite housings are rated to 200ft (60m).

The Ikelite housing for the P7100 is slightly larger than the Fantasea Line housing. Instead of using fiber optic cables, Ikelite uses a bulk-head, sync cord system to fire the strobes. On the outside, a sync cord goes from the strobe to the housings bulkhead. On the inside of the housing, there is a connection from the camera's hot shoe to the bulkhead.

When using Ikelite DS strobes, photographers have real TTL automatic exposure control. In order to use dual strobes, a dual (Y shaped) sync cord is employed. The housing includes a single release handle. Purchase a dual release handle if you want to use two strobes.

Ikelite accessories

Due to the camera's optics, Ikelite also uses a



Olympus XZ-1



Ikelite WD-4 wide-angle conversion dome

dome for wide-angle work. The WD-4 wide-angle conversion

dome snaps onto the housings lens port. For macro work, one can use the Ikelite external macro adapter on the housings lens port. Once this is in place, the Fantasea Line SharpEye M67 or any other close-up lens with a 67mm filter thread can be used.

Ikelite produces both blue and green water filters for all their housings.

For the Nikon P7100 housing, a filter #6441.46 is needed for blue water and #6441.86 for use in green water.

Olympus XZ-1

The current advanced point-and-shoot Olympus camera is the XZ-1. This camera has all the features needed for shooting underwater. Complete manual control, captures RAW files and has a large 10 megapixel 1/1.63 inch CCD sensor. The camera also captures 720p HD video and has a fast f /1.8 (W) - 2.5 (T) lens with a zoom range of 28-112 mm 35mm equivalent. There are a number of options for taking this camera underwater.

Olympus PT-050 Underwater Housing for the XZ-1

Olympus does a better job than most



Olympus PT-050 housing for the Olympus XZ-1

camera manufactures in meeting the needs of the underwater photographer. All camera controls are easily accessed from the housing. The controls are marked just like the controls on the camera. The PT-050 housing has a 67mm filter

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Olympus PTWC-01
100 degree wide-angle lens



thread on the lens port, so an auxiliary wide-angle lens, macro lens or filter can be added directly to the port. The housing is rated to 130ft (40m). Olympus includes a single fiber optic cable port in front of the camera's built-in flash. This is one of the housings weak points. Firing dual strobes becomes a challenge. Sea & Sea Strobe Mask Set is a fiber optic cable port and mask set for adding a port to housings that don't have one. Photographers can use two of these Mask sets on the housing's included diffuser.

Accessories for the Olympus PT-050

For wide-angle photography, the Olympus PTWC-01 100 degree wide-angle lens can be attached directly to the housing's lens port. The lens has a magnification of 0.6x. So, the 28mm 35mm equivalent lens of the XZ-1 becomes a 16.5mm lens. This allows one to get really close to large

subjects. For macro work, the Olympus PTMC-01 can be used. This auxiliary lens will double the subject's image size. The XZ-1 does have an underwater white balance setting. For available light photography, this is the same as using a digital blue water filter. If you still want to use a blue or green water filter, Equinox has them available with 67mm threads.

The Olympus UFL-2 underwater Strobe is designed to work with many Olympus cameras, including the XZ-1. In remote mode, photographers can control the strobes power from the camera. This allows for easy and creative lighting. The beam angle of the UFL-2 is on the narrow side, but by adding the optional diffuser, one strobe could cover a scene shot with the PTWC-01 wide-angle lens.

Ikelite Housing for the Olympus XZ-1

The Ikelite housing for the XZ-1 is very close in design to the Ikelite housing



Sea & Sea Strobe mask



Nauticam NA-XZ1 housing for the Olympus XZ-1

for the Nikon P7100. They share the same polycarbonate box and lens port. The WD-4 wide-angle conversion dome, external macro adapter, #6441.46 and #6441.86 filters can all be used with this housing. The housing utilizes the camera's hot shoe, using a bulkhead and sync cord for firing the strobes. When using Ikelite DS strobes, photographers have real TTL automatic exposure control.

Nauticam NA-XZ1 for the Olympus XZ-1

Nauticam NA-XZ1 housing is machined from solid aircraft grade aluminum. Usually this material is reserved for DSLR housings not ones for point-and-shoot cameras. This housing is rated to 300ft (100m). This depth rating and small size makes it perfect for the deep tech diver. Nauticam PowerShot S100 uses fiber optic cable ports to connect strobes and has a 67mm filter thread on the lens port. They also manufacture a similar housing for the Panasonic Lumix DMC-LX5.

Canon PowerShot S100

The Canon S100 is the smallest of

the advanced point-and-shoot cameras, but it is large in features. This camera has a 12 megapixel 1/1.7 inch CMOS sensor, captures RAW files and has complete manual control. The lens has a 35mm equivalent 24-120mm.

Canon WP-DC43 Underwater Housing for the S100

Canon produces a number of underwater housings for their cameras. These are inexpensive plastic housings with very few features. Photographers are able to access the important camera



Canon

controls, and the buttons are marked just like they are on the camera. A diffuser so one can get some decent results with the camera's built-in flash is included, and the housing is rated to 130ft (40m). There is a standard 1/4"-20 socket on the bottom, which can be used to add a light. What is missing is a way to attach lens accessories and to use fiber optic cables.

The WP-DC43 is very popular, and with a little bit of effort, one

Canon WP-DC43 housing for the Canon S100

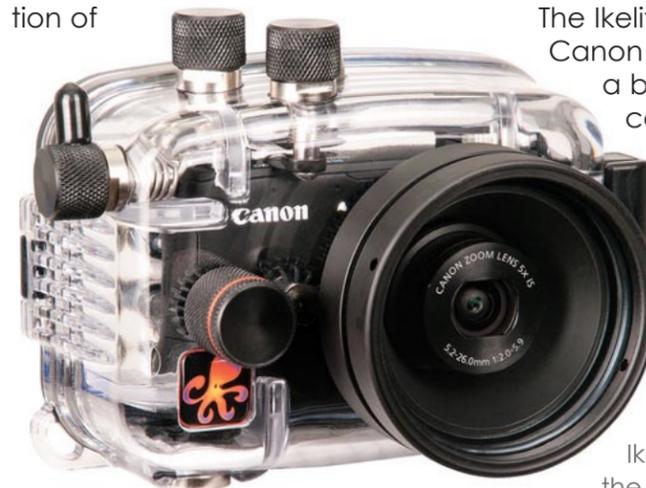


can still add the accessories needed to take professional underwater images. By using the Sea & Sea Strobe mask set, a fiber optic port can be added to the housing. Fantasea Line does have a BigEye dome and an EyeDaptor for this housing. With the EyeDaptor, macro lenses and filters with a 67mm thread can be used.

Ikelite Housing for the Canon S100

This Ikelite housing is very compact and form fitting to the camera. It is rated to 200ft (60m) and allows complete camera control. The lens port has a 67mm thread.

For wide-angle photos, the Ikelite W-20 wide-angle conversion lens can be used. This lens has a magnification of



Ikelite housing for the Canon S100

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0.56X. When used on the S100, you will have a 13.45mm lens equivalent, but you will get vignetting. To avoid this, you have to zoom the lens to a slightly more telephoto setting. This will still give you an angle of view of a 16mm lens. Macro lenses with a 67mm thread can be attached directly to the lens port. For available light work, Ikelite has the push-on #6441.41 filter for blue water and the #6441.81 filter for use in green water.

The Ikelite housing for the Canon S100 does not have a bulkhead or fiber optic cable ports. The housing includes a diffuser and reflector. The diffuser is for trying to get decent results with the camera's built-in flash. The reflector is used to bounce the light from



the camera's flash to a slave sensor. The sensor on the Ikelite AutoFlash AF35 is positioned to fire the strobe with this system. This strobe is designed for Ikelite's compact housings and other manufacture housings. It includes the tray and flex arm with the slave sensor attached. The strobe can be used in auto TTL mode. This works by mimicking the auto exposure of the camera's built-in flash. The strobe has exposure compensation, so the flash exposure can be fine-tuned. The AF35 also features manual control with six power settings.

Fix Housing for Canon S100

The Fix housing for the Canon S100 is manufactured from aluminum alloy and is rated to 230ft (70m). The housing allows for complete camera control including the camera's rear control wheel. All camera functions can be accessed with one hand. The housing has dual fiber optic ports and includes 52mm and 67mm filter adapters. The Fix UWL-28 Fisheye Conversion lens can be used on this housing. This will give you an angle of view of 168 degrees.



Fix housing for the Canon G12



Canon WP-DC34 housing for the Canon G12

Canon PowerShot G12

The Canon G series has been the advanced point and shoot digital camera to get since the year 2000 with the G1. These cameras have always been a favorite to take underwater. The Canon Powershot G12 is the current model. The camera features a 10 megapixel 1/1.7 inch CCD sensor, manual controls, shoots RAW files and has a 28-140mm 35 mm equivalent zoom.

If you want to keep it simple and inexpensive, the Canon WP-DC34 is the way to go. This housing shares all the same traits as the Canon WP-DC43 housing for the Canon S100. To go high-end, the Fix Housing for the Canon G12 has the same specs as the Fix for the Canon S100. There is a version of this housing rated to 300ft (100m). The Ikelite housing for the G12 is very similar with the Ikelite housings for the Nikon P7100 and Olympus XZ-1.



Canon PowerShot G12

Strobes

We discussed the Olympus UFL-2 and the Ikelite AF35. The Ikelite DS-51, DS-160 and the DS-161 strobes should be considered when using Ikelite housings for the Canon G12, Olympus XZ-1, and the Nikon P7100. These strobes are available in a kit with Ikelite arms that are compatible with the quick release handle that is included with these housings. All of the strobes could be attached to the housings bulkhead and will provide TTL exposure control.

The DS-160 is a powerful 160-watt seconds strobe, that has a beam angle of 90-degrees without a diffuser. It recycles in 1.5 seconds at full power, and the strobe is powered by a NiMH battery pack that provides 225 flashes per full charge.

In manual mode, the strobe has nine power settings. There is a 5-watt LED aiming light that turns off when the strobe fires. This way, you won't get a hot spot when shooting with a slow shutter speed. The DS-161 has the same features but has a 15-watt LED video light. The LED



Ikelite AF35 strobe for compact cameras

Ikelite DS-51 strobe



The DS-51 has 50-watt seconds and has a beam angle of 70 degrees without a diffuser. It is powered by four AA batteries and recycles in 3.5 seconds at full power. The strobe does not have an aiming light, but it is compact and affordable.



Ikelite DS-161 strobe

For manual exposure control, there is a dial with ten settings. The YS-01 also has DS-TTL, which mimics the camera's built-in flash; it has a LED aiming light.

Video Lights

Since some point-and-shoot cameras can be used to capture video, many images makers want to add a video light to their rig. The Ikelite Pro-V8 is a compact LED light designed to be used with compact cameras. This light has three 5-watt LED diodes that produce 510

lumens. The light has a 45-degree beam angle and produces 500 lumens of light. This light can also be used as an aiming light and will shut off when the strobe fires.

The Light & Motion 1200 is an excellent to use with a point-shoot camera. This compact, you could next to a strobe with ball clamp. The light wide-angle and spot produces 1200 lumens a built in rechargeable battery. The light has three power settings and has a one-hour run time at full power. ■



Ikelite Pro-V8 LED video light

45-degree beam angle. Sola LED light and-light is so mount it a triple has a setting. It and has



Sea & Sea YS-01 strobe



Light & Motion Sola 1200 LED video light

Seth Casteel



P O R T F O L I O

Edited by Gunild Symes
All images by Seth Casteel

Move over human divers, you're not the only ones who love to dive. Apparently, divers these days are not just of the hominid kind—American photographer, Seth Casteel, has captured the astounding and often humorous side of our canine companions who love to dive underwater. We caught up with the world famous photographer after some of his underwater dog images went viral and asked him about his unique perspective on man's best friend underwater.

Outer Space, Golden Retriever by Seth Casteel
PREVIOUS PAGE: *Sharing is Caring, Nevada the Border Collie & Bardot the Yellow Lab* by Seth Casteel



Seth Casteel



underwater photography. In 2010, I was photographing a Cavalier King Charles Spaniel named Buster in his backyard. The shoot was meant to be 'on-land', but Buster decided it should be 'in the pool' when he began diving in over and over again after his mini tennis ball. I wondered, "What does he look like under there?" If he never jumped into the pool, I doubt I would have pursued this!

X-RAY MAG: Do you freedive or scuba dive or both with your dogs and why?

SC: I freedive so that I have better mobility. It's necessary for me to move fairly fast through the water to achieve some of the photos, so having heavy scuba gear on me would make it quite difficult.



Sunken Treasure, Bardot the Yellow Lab (above) Haunted Surprise, Buster the Cavalier King Charles Spaniel (right). All images by Seth Casteel

X-RAY MAG: How and why did you get into underwater photography?

SC: I've never really been interested in underwater photography—only animals, especially dogs. And dogs are, in fact, the reason why I began to explore

X-RAY MAG: What inspires you about the underwater world, about dogs underwater?

SC: The underwater world is such a mystery. From the depths of the oceans to just below the surface of your neighbor's swimming pool, there is a hidden world of opportunities. Uniting this world with our best friends is just exhilarating! Water is surprisingly natural for most dogs, and it presents them with opportunities to explore their wild instincts and allow their brilliant range of emotions to shine through. It's also unpredictable. You never know what's going to happen. Unpredictable subjects in unpredictable situations result in super unpredictable moments!

Lulu, a Parson Russell terrier, plays underwater fetch in a Phoenix, Arizona, pool. The quintessential shot required a friendly rapport between dog and photographer, around ten dive attempts, agility underwater and perfect timing. Featured in *National Geographic—Visions of Earth* August 2012





X-RAY MAG: Do you work just in the pool or also in open water, ocean, lakes, etc.?

SC: I've worked mostly in the pool, but have started shooting in salt water and fresh water. One of the photos in [my new] book was shot in the Puget Sound. Super excited about that one!

X-RAY MAG: Do you photograph critters other than dogs underwater?

SC: I have, but I'm definitely most interested in dogs. I think Mermaids would be cool to photograph, if we can find some one day. If not, maybe dogs

dressed up as Mermaids.

X-RAY MAG: What's it like to have dogs as models? What did you do to prepare or approach the shots?

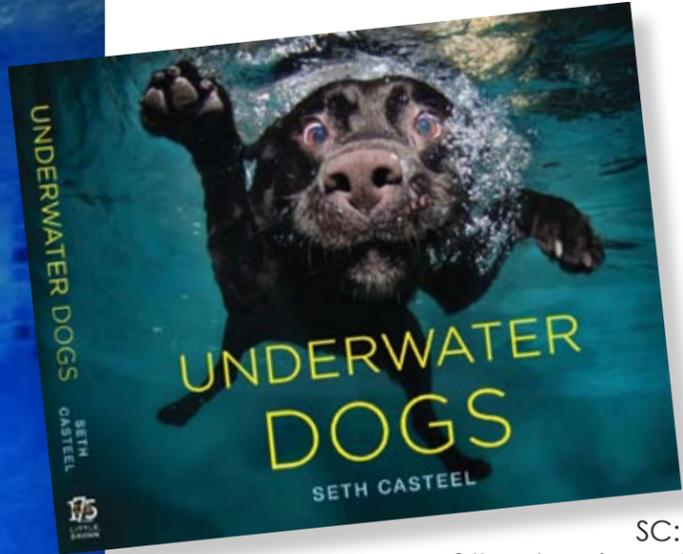
SC: I don't do much to prepare—I like to keep it as spontaneous as possible! Show up. Befriend the dog, earn their trust. Play some games in the pool. Snap some photos. It's really all about the dynamic of the relationship I have with the dog and how interested the dog is in playing games. Some dogs are certainly on-land photo shoot kind-of-dogs, but it's amazing to see how many dogs will dive into the water and

check things out. Many of the dogs I've worked with have never even been swimming before. It's unreal!

X-RAY MAG: Describe your artistic vision or aesthetic approach/philosophy.

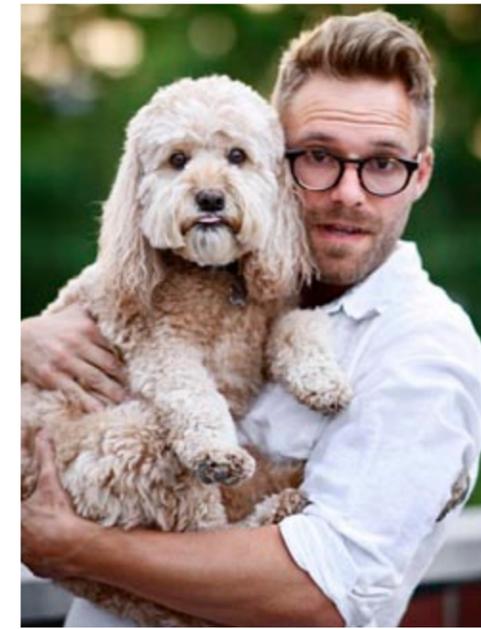
SC: My vision is to showcase the brilliance and complexity of the emotion of dogs. My approach is to embrace the lifestyle of dogs on-location and keep things super positive and fun. I don't shoot in the studio because I personally don't know any dogs that just LOVE to be in a weird, sterile studio environment with strobes flashing off. And I know a lot of dogs.

Paws First, Yellow Labrador Retriever (above); Mr. Beefy, the Olde English Bulldogge (top left). Images by Seth Casteel



Seth Casteel

CLOCKWISE FROM FAR LEFT: *Buster the Cavalier King Charles Spaniel*; Cover of Casteel's new book; Casteel and friend; *Focus, Bardot the Yellow Lab & Nevada the Border Collie* by Seth Casteel



SC: All of the dogs in my book have chosen to go in the water and under the water of their own free will. And they all had fun. The experience has been inspirational for me—to watch a dog that has never been swimming before choose to jump in, retrieve a ball and emerge victorious. Dogs teach us all about life in the strangest of ways. If you just jump in, you might have fun along the way.

For more information, visit Seth Casteel's website and gallery at: www.littlefriendsphoto.com To preorder his new book, *Underwater Dogs*, see: www.amazon.com ■



X-RAY MAG: What underwater equipment and camera gear (any extra staff?) do you use and why?

SC: Canon 7D/fisheye lens with a variety of housings. No extra staff, although I do often collaborate with the dogs' human companions. I love the 7D for the tracking and frame rate. The fisheye lens is [used] to achieve that "Wow, that dog is really close!" effect. Have had good luck with a number of housings—each definitely has its advantages.

X-RAY MAG: Now that you have the underwater gear, what do you want to do with it? What are your future plans for your underwater work?

SC: I'll keep working with dogs in the water, and we'll see where else that takes me! I have some other ideas...

X-RAY MAG: Tell us about your background that led you to photography and to your work underwater.

SC: I got started in photographing dogs through volunteer work at Los Angeles animal shelters. I snapped improved photos to help increase adoption rates. One thing led to another, and all of the sudden I had a career! Helping animals in need is still a big part of my photography—I started a non-profit called **SecondChancePhotos.org**. Definitely check it out—one photo can save a life!

X-RAY MAG: Tell us about your new book and what divers might like about it.

SC: The book is called, *Underwater Dogs*, with a release date of October 23. It features dozens of never-before-seen underwater photos starring new 'underwater models'. A Pug. Twelve-week-old puppies. A Wolf. That's just the beginning. Divers appreciate the hidden world underwater and the various surprises that present themselves. Every page in this book offers just that!

X-RAY MAG: What else would you like our readers to know about you and your work/adventures underwater?

