



photo & video

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freediving
with underwa-
ter camera

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Taking pictures while freediving can be a real physical challenge, but in some cases, it may be the only option to get the subject in front of your lens.

Freediving in order to take underwater photographs is not the norm, but there are many freedivers who do just that—for example, the freediving icon Fred Buyle. It is also a good technique to use for practical reasons; Without noisy bubbles, it becomes possible to get closer to shy creatures. But the main advantage is that it's easier to keep up with fast moving animals, such as marine mammals and sharks, when you do not have to propel bulky scuba apparatus through the water, too.

The kit

Compared to the scuba laden shooter, the freediving photographer tends to swim further and faster, so camera rig and equipment need to be optimised for these circumstances. The choice of diving equipment is also important, which will be discussed in further detail below.

The goal is to keep the camera as hy-

drodynamic and compact as possible. While artificial light is needed, only one flash unit should be mounted. A double-flash configuration would produce substantial drag and appear too large to

an animal, scaring it off. In general, the classic apnea subjects—such as whales, dolphins, sharks, manta rays and other pelagic marine animals—live in the surface layers of the sea where ambient

light is sufficient.

But even without a flash, the housing should have as little resistance as possible. Big dome ports, from 18cm of diameter and up, produce significant drag, so

if you plan to pursue freediving photography more actively, you should consider getting a smaller dome. However, there are a few points to be observed.

The smaller the diameter of the dome



Apnea Pix

Freediving for underwater photographers

ANDRAS GRUBER





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Freediving icon Fred Buyle



Freediver Recovery Vest (FRV) electronics and two 38-gram CO₂ cartridges, which provide sufficient lift from depths of up to 45 meters

port, the less depth of field we get for a given aperture. This is related to the imaginary image the dome as a spherical lens projects in front of it. Using a 22cm dome, you may still achieve a full depth of field with an aperture of f:2.8, whereas with a 18cm, you will lose about a third of that. To compensate, the aperture needs to be stepped down to 5.8 or 8 in order to achieve a complete depth of field. For even smaller ports, the effect is even greater.

Back in the film (or analog) era, using ASA/ISO 100 using apertures from 2.8 to 4.5 were the order of the day, which is why the super dome ports were required to achieve full depth of field. Today, with modern cameras, where 400 to 600 ASA / ISO can be used without loss of quality, such large apertures are no longer relevant. Even under the most difficult lighting situations, it is rarely necessary to open up the aperture further than 5.6.

Exposure

When working with flash, everything is the same as before, and classic flash techniques come into

play, depending on whether wide-angle, standard focal length or a macro lens is used. The flash takes priority and is controlled by the aperture after which the capture of ambient light from the background is dictated by the shutter speed.

When working only with natural light, these rules no longer apply. Where a flash is not used to freeze the motion of fast moving animals, one depends



Freediver Recovery Vest (FRV)

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order to save time. Once again it should be emphasized that shutter speed takes priority, and aperture and exposure is less important.

Should the aperture, in the case of too little ambient light, start to go below a value of 8 or 5.6, increase the ISO value rather than reducing the shutter speed!

Getting the shot

The difference between shooting while freediving and shooting while scuba diving is that the photographer usually has virtually no time to get the subject in front of the lens, let alone to mess about with camera settings. In other words, all important settings must be made prior to the dive. Already at the surface, the photographer can see the subject, assess the situation and decide from which side it is best approached, and then adjust the



Freediver Fred Buyle in shark encounter

on shutter speed. This must always be set faster than the relative movement between the subject and photographer, which of course depends on the situation. For example, when you approach a floating sperm whale, the shutter speed must be at least 1/350 seconds to ensure no motion blur occurs.

Ensuring correct exposure is then controlled via the aperture setting. In daylight photography, the camera can be used in automatic mode. With the camera set on "Shutter Priority", we do not have to care about anything, even if the lighting conditions vary. Only in situations where there is strong sunlight coming in from

the side, or in front of the camera, which should be avoided anyway, the +/- exposure correction can be set at approximately 2/3 stop of overexposure. It is, of course, also possible to use the camera in "manual" mode and use the built in light meter as a guide, but I generally recommend using an automatic mode in



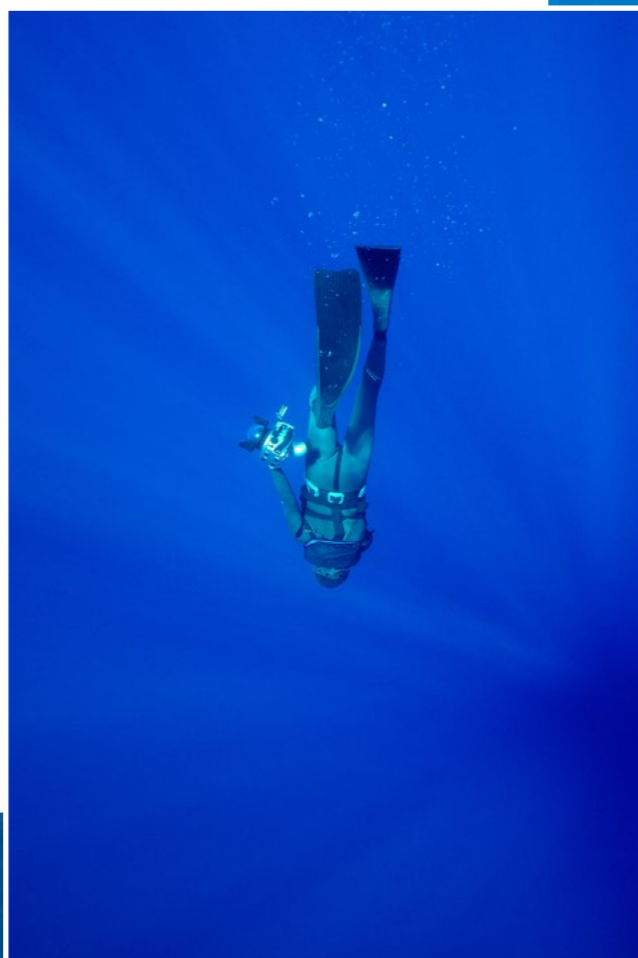
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Underwater photographers freediving with whale shark (right); The proper streamlined silhouette of a freediving photographer with streamlined camera gear (below)

Freediving

camera settings accordingly.

A proven trick when capturing marine mammals, sharks and schools of fish is to preset the focus, so that the autofocus will not go hunting among several moving subjects. For example, while holding your legs out straight, focus your camera on the tip of your fins. Then flip the AF / M switch from Autofocus to Manual focus, which will then leave the focus setting where it is. Since we usually work with the aforementioned subjects



with super-wide angle or even fisheye lenses anyway, a f: 8 aperture will produce a

depth of field from about 80cm to almost infinity. To benefit from this old trick, the underwater housing must, of course, have such an AF/M switch.

When working with natural light, the subject should appear fully lit, which means that you should approach the subject with the sun at your back. With the sun coming in from the side or even from the front, the subject tends to appear too dark

against the background and the water can appear cloudy and dull, too. Exceptions are, of course, deliberate creative choices or backlit scenes.

Diving technique

It is not just the camera gear that needs to be streamlined, so does the dive equipment. Consequently, freedivers equip themselves accordingly—with tightfitting, smooth suits, long fins, masks with small volumes and short simple snorkels.

Breathing technique, pressure equalization methods, etc. remain the same for the most part, but may be adjusted according to the shooting situation. It is, for example, impossible to calmly prepare for a dive while swimming alongside a whale shark.

It is important, whether diving with or without a camera, to get the weighting correct so positive buoyancy will be set in at around six meters of depth.

Equally important is to not exceed dive times beyond training levels and to

be mindful of safety. It is only too easy to become fascinated with a particular subject in the viewfinder and ignore or suppress the respiratory stimulus and hunger for air for too long, increasing the risk of hypoxia or shallow water blackout just below the surface.

To this effect, multiple U.S. champion, Terry Mass, developed the freediving lifejacket. The "FRV" (Freediver Recovery Vest) is equipped with a timer and depth gauge, which can be individually programmed to suit personal needs. The vest

Freediver with inflated FRV, or Freediver Recovery Vest



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The Magic Filter restores many of the colors that are lost underwater due to absorption, from six to 15 meters approximately

is automatically activated depending on the programming, or by hand. The FRV consists of two bladders, which fit very snugly, and a small neck part, which houses the electronics. It does not prevent any freedom of movement and has little water resistance. The volume of the bladder is 16 liters and is equipped with two 38-gram CO₂ cartridges, which will provide sufficient lift from depths of up to 45 meters.

Color correction filter

I also recommend bringing the so-

called "Magic Filter", which, at depths from about six meters to about 15 meters, depending on water clarity and sunlight, will restore a large part of the colors that are otherwise lost by absorption.

The principle is based on the conversion of color temperature and color balance. This unique invention takes advantage of the technology that comes with modern digital cameras and is primarily designed for wide angle and fisheye lenses. For shooting against the surface and at depths less



than six meters, it is not well suited as the ambient light will appear lacking magenta.

Using Magic Filters where no artificial light may be used is a no-brainer, but for greater depths and sunless days, it is best to do without it. The filter only works optimally in bright sunlight and clear water. And the colors are the most beautiful when the subject is fully illuminated.

There are Magic Filters for the most popular and super-wide fisheye lenses. Recently, they have also been produced for compact cameras. For more information about sizes and compatibility, please visit www.magic-filters.com.

For more information about Kurt Amsler and his underwater photography courses, please visit his website at: Photosub.com



Manatees feeding

41^{ÈME}

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Gates Arri Alexa Housing

Gates Underwater Products has announced it will be releasing two new housings for the Arri Alexa cinema cameras. One of the new housings will be for the Arri EV and XT camera models and the other will be for the Arri XT Plus. Both housings will feature Gates Precision Port and support over 70 PL mount lenses. Gates is advising that both housings will be available in the fourth quarter of this year and prices will be confirmed prior to release.



Sea&Sea RX100-III Housing

Sea&Sea has also announced the new housing for the Sony RX100-III compact camera. The MDX RX100-III housing is made from black galvanized, corrosion resistant, aluminum. Sea&Sea states that the design allows the camera's internal flash to be activated and used to trigger external strobes via fiber optic connections. The housing's design also allows the camera's LCD to be set at a ten degree angle, making it easier to use when composing images underwater. Access to the RX100's front and rear control dials, which are critical for using the camera in manual mode for underwater photography, are built in to the new housing. The MDX RX100-III will be available in early September at a U.S. retail price of \$996.



Subal ND4S Angler Housing

Respected Austrian housing manufacturer Subal has announced its new housing for the Nikon D4s SLR camera. Subal is calling the new ND4S housing the "Angler" and states it is the first of a new series of next generation housings the company will be releasing. The housing provides access to all the important camera controls on the D4s and is compatible with the preceding Nikon D4 camera. The ND4S Angler is available now at a U.S. retail price of \$6,500.



Recsea RX100 III Housing

The Japanese housing manufacturer Recsea has announced its new housing for the Sony RX100 III compact camera. The WHS-RX100 III housing is CNC machined from anodized aluminum and provides access to the front and rear command dials on the camera, both of which are critical for using the camera in manual mode for underwater photography. The rear command dial also has a push button function for accessing the center button.

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Sony PXW-X70 Camcorder

Sony has announced the upcoming release of a pro XDCAM camcorder which will be upgradeable to 4K before the end of 2014. The PXW-X70 camcorder features a 1-inch type Exmor® R CMOS sensor together with a Zeiss Varion Sonnar T lens and Wi-Fi control. The camera will be available in fall 2014.



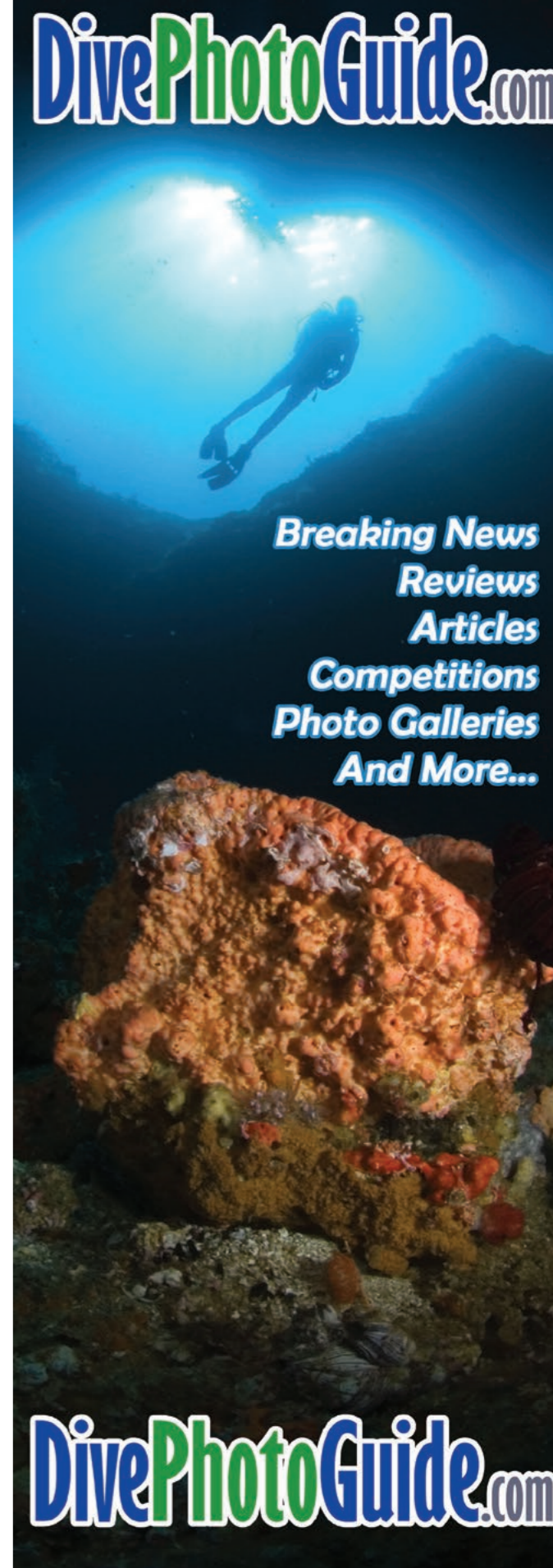
Ikelite RX100 III Housing

Ikelite has also released its housing for the new Sony RX100-III. Importantly, the housing provides access to the RX100's front and rear control dials, with a rotating gear wheel on the front of the housing to provide easy access for front control dial. Both these control rings are critical for using the camera in manual mode for underwater photography. The housing also features dual fiber optic ports for strobe triggering.



Nauticam GH4 Housing

Nauticam has announced their NA-GH4 housing for the very highly regarded Panasonic Lumix DMC-GH4 camera. The NA-GH4 is configured to maximize the excellent video potential of the Panasonic GH4 camera and features a thumb operated button for ISO adjustment, a lever for white balance and access to both control dials. Nauticam also announced the availability of an inexpensive upgrade kit for owners of the earlier NA-GH3 housing who wish to use it with the GH4. The NA-GH4 is available at U.S. retail price of \$2,250.



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