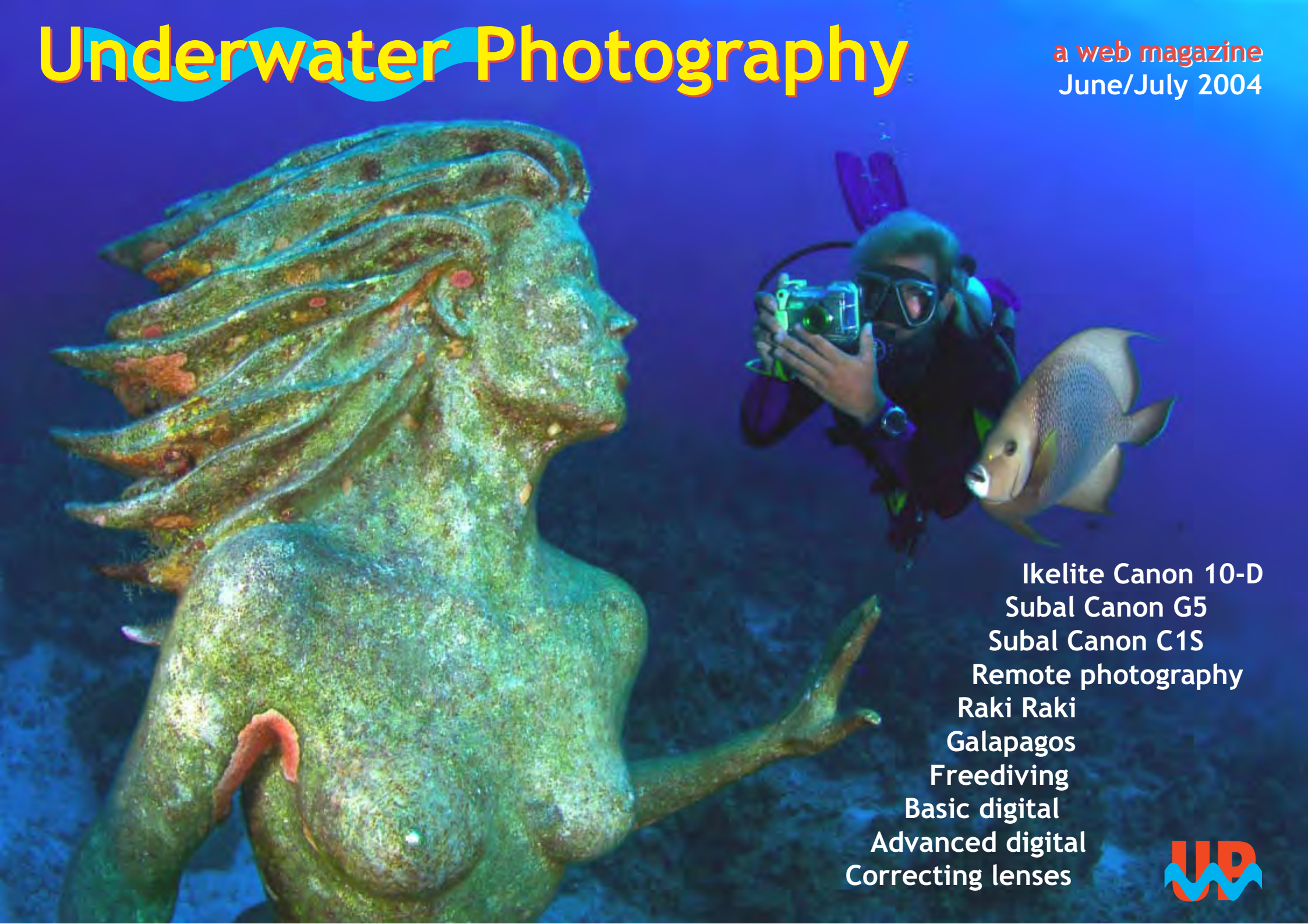
Underwater Photography

a web magazine
June/July 2004



Ikelite Canon 10-D
Subal Canon G5
Subal Canon C1S
Remote photography
Raki Raki
Galapagos
Freediving
Basic digital
Advanced digital
Correcting lenses

Digital solutions

INON UK

Four strobes for the digital enthusiast. Choose the features you need including auto exposure and modelling lights.

Two wide angle lenses for shooting large subjects. Optional dome port lets you use your existing lens for superwide angle photography.

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www.oceanoptics.co.uk

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a web magazine
June/July 2004
e mail uwp@uwpmag.com

by Jeff Mullins

by Sea Shepherd

with Alexander Mustard

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by Alexander Mustard

by Peter Scoones

Cover by
Alexander Mustard

by Peter Rowlands

by Peter Rowlands

Sipadan to close

In May this year it was announced that all the dive operators on Sipadan have to dismantle their developments on the island and vacate by the end of 2004. The aim of this is to try and help the island and marine environment recover from decades of concentrated tourism and diving.

To anyone who has visited Sipadan recently I understand this should hardly come as a surprise. Such intensive activity on so small an island was bound to have a detrimental effect on the island and the marine life.

What concerns me about this news is that the dive operators are not happy with the decision so I can only assume that they would be willing to carry on attracting divers to the island until they have sucked out the very last drop of the island's resources then there would be nothing left to attract divers and their businesses would go bust.

This attitude is fairly typical in today's business led, profit motivated world but it doesn't stop with just the dive operators. Some dive travel agents could be accused of piling in dive tourists to such fragile environments regardless of the consequences until the ecosystem can take no more and we, the travelling divers, are as guilty for creating the demand to visit and dive such places. The result is that we are all, more or less, guilty.

I wish there was a solution where dive activity and natural resources could be balanced but I guess I'm asking for the impossible because there is always a section of society who want to shoot the very last elephant or eat the last shark fin.

Editorial

The amazing internet

As I am sure you know, the beauty of UwP and the internet is that there are no printing and distribution costs which helps to keep it free but another amazing thing about the internet is shown by how UwP19 has been finalised ready for downloading.

My responsibilities are to put together each Issue of UwP to as good a standard as possible from my base (it's more of a desk, really) near London and Deb Fugitt handles the website design and marketing from Fort Worth, Texas. Everything was going well with the production of UwP19 when Deb got an offer to do some research for a future project in Indonesia. This meant she would be away at the time UwP19 should be published but with the twin miracles of a laptop computer and an Internet Cafe in Tulamben we have been able to get UwP19 out to you in time.

The other amazing thing about the internet and UwP is that the deadline for each issue is really only a few minutes before the Issue is uploaded to the server so to prove just that here is a photo of Deb in Tulamben uploading the files for the website.

Now that I've got the photo I can add it to this page and make the final pdf file of UwP19 (which is laid out in Adobe Pagemaker, since you asked).

With that done it takes a couple of minutes to upload to the server and be available worldwide at no charge!

Who said technology isn't amazing?

I realise that web site operators will be saying to themselves "What's the big deal? We are

constantly updating our website from wherever we are in the world". Well, yes I agree but UwP is a like traditional magazine with good old fashioned deadlines and when each issue is finished, that's it. It doesn't get changed, just like a traditional magazine.

The other benefit is that all Issues of UwP are still available to download and the next Issue will be the end of our 3rd year.

Where has the time gone?

peter@uwpmag.com

Readers Lives

Any unwanted underwater photo equipment?

Hi

I am a photographer form Poland - north-east Europe - region Mazury- near the Russian border.

I am studying at The Academy of Fine Art in Gdansk - in the photography departament. I love to take photos under ice in winter - this time is the best to dive in Polish lakes because the water is clean (water visibility 5 to 15meters - I know that is not much but in Polish conditions it is very good). The thin ice is the best background to take underwater landscapes with sunset - parts of underwater plants left in the ice. The underice mazury photography is very specific, because in winter light is very soft and in short lived.

I attach some samples of my work. I took all of underwater photos with a Nikonos IVa with 35mm and Kodachrome 100 VS - and scanned them on aNikon Coolscan 4000 ED.

There is a very big problem to buy a underwater equipment in my country. It is very expensive for a student.

If you have any underwater equipment which is unnecessary to you or may be broken, please send it to me. I will repair it and will be very happy. New underwater equipment is too expensive for a poor student. I will pay for shipping and any costs.

Plese visit my website - the english version will be soon.... www.mazurypodlodem.prv.pl

Kind regards

LUKASZ OLUKE OGANOWSKI
admin@pletwal.com
www.mazurypodlodem.prv.pl

Want to have your say?
E mail peter@uwpmag.com

News, Travel & Events

South Florida UPS

The South Florida Underwater Photography Society is a non-profit organization dedicated to the promotion of underwater photography through its membership. The South Florida Underwater Photography Society was created in 1980. SFUPS was created as a means and place for fellow underwater photographers to meet and talk with other underwater photographers to exchange and share ideas by discussing them. They would listen to lectures from professional underwater photographers, organize interesting dives with photographic opportunities and promote the sport in general. At the time, there were only a few books on the subject so people were learning about underwater photography by trial and lots of errors. It was and still is word of mouth that has allowed SFUPS grow into what it is today.

SFUPS has been meeting at its current location for 10 years now which has grown into a monthly meeting place where all who share the common interest of underwater photography are exploring and learning from one another for the sake of capturing better underwater images.

Monthly meetings consist of guest speakers; slide presentations, intra-club slide competitions and exchanges of information relating to scuba diving and all aspects of underwater imaging. Each month a colorful newsletter is sent out by email, which provides articles and photos of the previous month's intra-club contest winners. We also organize dive trips both local and exotic with the photographer in mind. At year's end at our holiday party, the person with the highest points accumulated from the contests and club participationis awarded as our photographer of the year.

Everyone is invited to attend the meetings to learn more about underwater photography and to meet others who share the same interest.

SFUPS meets the second Tuesday of Each Month, except December, at the Holiday Inn at Calder Racetrack/Pro Player Stadium 21486 NW 27th Avenue Just South of the Broward/Dade County Line 7:30pm

Why did SFUPS get such a large feature? They printed off our flyer to promote UwP! See our web site for details.

www.uwpmag.com

Special Expedition to Wolf & Darwin, Galapagos Islands

16th-27th November 2004

Scuba Safaris are pleased to announce that they have chartered the Galapagos Aggressor for a 7-night cruise to Wolf & Darwin Island in November 2004.

Because they have chartered the entire vessel a very generous discount is available to all who join this trip.

The cost is £2695 per person in twin share which includes return economy class airfares from London to Galapagos Islands. All transfers. 2 nights' hotel accommodation at the Four Points Sheraton on a bed & breakfast basis, 7 nights twin share cabin aboard Galapagos Aggressor including all meals & drinks (except dinner on the final night of the cruise) 5 days unlimited diving, tanks, weights & airfills.

For further details visit www.scuba-safaris.com

SCUBA SAFARIS

2 Week Wreckfest at Bikini Atoll

May 6th-25th 2006

Always fancied doing TWO weeks at Bikini Atoll? Well, now's your chance! Scuba Safaris are arranging a two week special trip in May 2006 that will allow 24 dives on Bikini's fabulous wrecks.

The cost is £4455 per person in twin share which includes all airfares in economy class. All transfers. 2 nights Honolulu & 1 night Majuro hotel accommodation on a room only basis. All meals at Bikini Atoll. 24 decompression dives at Bikini Atoll. Tanks, weights, airfills, Nitrox deco mix & divemaster services.

For further details visit www.scuba-safaris.com

A View To A Thrill

Photo: 5-inch guns, USS Saratoga, Bikini Atoll. By Jim Breakell

Papua New Guinea, Marshall Islands, Palau, Truk Lagoon, Yap
Tahiti, Fiji, Thailand, Indonesia, Costa Rica, Ecuador
Belize, Honduras, Turks & Caicos Islands, Cayman Islands, Saba

SCUBA SAFARIS

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BLUE SHARKS AND KELP FORESTS

The Channel Islands of Southern California with Charles Hood

Saturday 11th September - Sunday 19th 2004 (9 days)

Charles Hood, the accomplished underwater photographer and journalist, will return to the Channel Islands to lead this tour, which is his choice for the most unusual photographic opportunities and exciting shark encounters. Charles will be on hand for informal photographic discussion and critique, but non-photographers are equally welcome. Not only is this unique trip almost impossible to arrange on an individual basis, but travelling with Charles means that the group is completely in control of its own diving management and will certainly benefit from Charles's knowledge and experience.

The trip consists of 6 days diving including both boat diving around Catalina itself and all day shark diving trips out into the Pacific Ocean. Night diving will be available (at extra cost). Nitrox, both 32% and 36%, is available for a supplementary charge, payable locally.

The cost is £1863 .For more details visit www.divequest.co.uk

DIVEQUEST
The Ultimate in Diving Holidays

WAKATOBI PHOTOQUEST

6th October - 20th October 2004

Leader: Martin Edge

Martin Edge is widely acknowledged as one of our leading underwater photographers and is probably the finest teacher of underwater photography skills.

Martin's expeditions combine the stimulus of diving with a group of like-minded people with continuous input from Martin himself in superb diving locations.

During the trip, under the experienced leadership of Martin and with the support of Sylvia, you can expect to learn both macro and wide-angle techniques including working with shallow water and sunlight, framing the shot, composition and indeed any topic that turns up.

With E-6 processing available on a daily basis at Wakatobi, mistakes can be rectified, techniques developed and skills honed.

www.divequest.co.uk

DIVEQUEST
The Ultimate in Diving

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Bonaire, Venezuela
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Layang Layang
Derawan & Sangalaki
Bali, Komodo, Wakatobi,
Manado, Kungkungan Bay

Palau, Yap, Truk
Bikini Atoll
Australia's Coral Sea
Papua New Guinea, Solomons
French Polynesia
Fiji, Hawaii,
Sea of Cortez
Revillagigedo Islands
Cocos & Malpelo Islands
The Galapagos
Wrecks of Palau

Plus Underwater Photography Group Trips and Courses with leading photographers: Martin Edge, Linda Dunk, Malcolm Hey,

Charles Hood, Gavin Anderson and Alex Mustard.

The Ultimate in Underwater Photography Adventures

DIVEQUEST
ATOL Protected 2937
Telephone: 01254-826322
e-mail divers@divequest.co.uk website: www.divequest.co.uk

Photo by Pat Morrissey

Celebrate the Sea Marine Imagery Festival

29 July - 1 August, Kuala Lumpur, Malaysia

Calling all underwater image makers - send in your entries to Asia Pacific 's most prestigious underwater imaging competitions.

Cash and Product prizes from EPSON, NIKON, SEACAM, SONY, IKELITE, OceanNEnvironment, DIVE GEAR USA, ECO-SYS, Minahasa Lagoon Resort, Murex Resort, Lembeh Resort, Pulau Sipadan Resort, Lankayan Resort, Redang Kalong Resort, Seraya Resort, Yos Diving Bali, Berjaya Resorts, Berjaya Time Square.

Deadline Registration: 1 July 2004

The Premier Awards

David Doubilet - Award of Excellence

Stan Waterman - Award of Excellence

Celebrate the Sea Underwater Image Maker Scholarship

Celebrate the Sea Underwater Image Maker Photographer of the Year

OceanNEnvironment's / Asian Geographic Environment Award

Check at www.celebratethesea.com or email cts@oneocean.com for an application form.

CELEBRATE THE SEA & WETPIXEL.COM DIGITAL PORTFOLIO Competition

Underwater photographers - novice or professionals: this is the chance to enter the most prestigious underwater DIGITAL imagery competition in th world. Held in association with the Antibes Festival Mondial de I'lmage Sous Marine, WETPIXEL.Com and Celebrate the Sea Imagery Festival Kuala Lumpur 2004, the cash, equipment and holiday prizes are value to over USD $60,000.

Winning entries may also be selected as front cover photo for Scuba Diver Australasia. The results will be announce at a GALA AWARD Ceremony on 31 July 2004 in Kuala Lumpur.

Entry is easy Email: digital@oneocean.com for entry form. Or download entry form at www.Celebratethesea.com or www.Wetpixel.com

CELEBRATE THE SEA - Beneath Southeast Asian Shoot-Out Competition

The Shoot-Out competition is now in its second year and is the richest of

its kind in the world, with prizes totalling over USD 60 000 in cash,

equipment and holidays. Images must be captured between 1 January and 2 July 2004 at one of the participating resorts in South East Asia.

Check at www.celebratethesea.com for information.

8th Open Internacional Fotosub Isla de El Hierro

Next 27th October – 1st November will be celebrated the 8th edition of the underwater photography competition **"Open Internacional Fotosub Isla de El Hierro".**

This is an international open competition that celebrates since 1996 in the Marine Reserve located in the small island of El Hierro (Canary Islands), one of the most appreciated diving zones for European divers.

It is organised by the Tourist Board of El Hierro Island and Carlos Minguell (twice World Champion of Underwater Photography) is in charge of the Technical Direction since 1998.

The **"Open Internacional Fotosub Isla de El Hierro"** consists of two days of competition, with a total of 4 dives in the best diving points. A collection of six slides (freely selected by the participant, without any obligatory categories) is presented by each participant. A Jury composed by prestigious and experienced underwater photographers gives the results on the last day. There are big prizes for the best collections and also other special prizes to spectacular images representatives of the uniqueness of the El Hierro waters and marine life. This year there will be a total of

18000 Euros of cash prizes.

The number of participants is limited to 28. For any enquiries about the competition, please, write to the Technical Direction Department: openfotosub@ocean-photos.com. The information about the 8th **Open Internacional Fotosub Isla de El Hierro** is available at http://www.openfotosub.com.

The Blue Dolphin of Malta 2004

International Underwater Photographic Competition

The Federation of Underwater Activities – Malta (F.U.A.M) welcomes you to the Maltese Islands and invites you to participate in the 11th edition of the Blue Dolphin of Malta international underwater photographic competition. This edition is being held on the beautiful sister island of Gozo from the 9th to 14th November 2004.

For five days, competitors and their models, judges and journalists from various countries, are meeting to respectively share and exchange, the pleasures and knowledge of capturing the beauty and wonders of the Mediterranean Sea. All will once again dive into Maltese Islands' clear blue waters and shoot on film – to capture not to kill - the beauty, colour and grace of the blue!

The Blue Dolphin of Malta became, and still is a very important and renowned event throughout the international diving community.

The Blue Dolphin of Malta is an excellent opportunity to discover the beauty of the Mediterranean Sea and the marine environment in general. The waters around Gozo are famous for their clear blue waters, cave and deep diving.

Each competitor will compete over two days (six hours), to present a set of three slides. The slides must include one macro or close up (all subjects except fish), one fish (macro or close up) and one wide angle (ambient).

A Disposable Camera competition is being included again to attract more divers to this speciality and encourage them to discover underwater photography. Finally, for the first time, a Digital underwater photography competition is being organized for all those digital enthusiasts.

The 11th Blue Dolphin of Malta International Underwater Photographic Competition is organised by FUAM in collaboration with Malta Tourism Authority (MTA), Malta Olympic Committee, our official carrier Air Malta, Malta Maritime Authority (MMA), FUJI and St Andrews Dive Cove. Many thanks to all the other sponsors and other partners; without them there will be no Blue Dolphin of Malta.

For further information please visit our website www.fuam.org or contact FUAM on fuam@digigate.net or tel. 00356 99424275 or fax 00356 21578167

Digital Shootout Fiji 2004

Around 50 people attended this years shootout in Taveuni, Fiji from May 6th to 15th sponsored by Wetpixel, Backscatter, Light & Motion, Adobe and Optiquatics and hosted at the Garden Island Resort.

There was a competition at the end of the trip and the standard of images was very high.

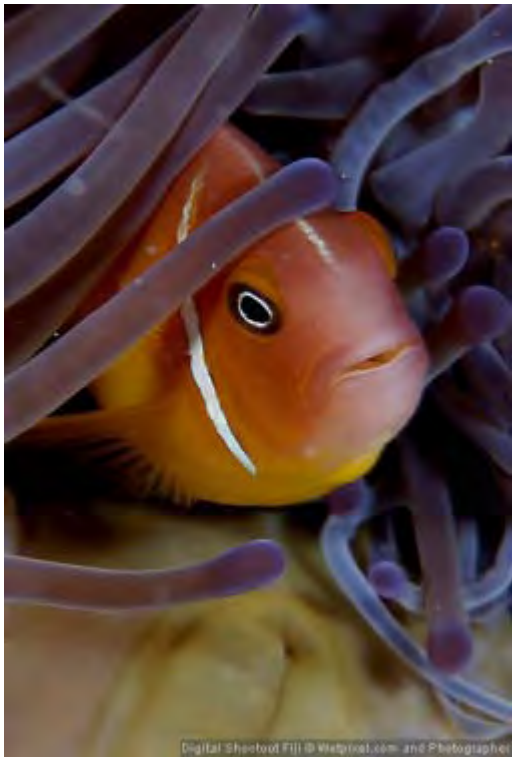
The " traditional " categories allow for the adjustment of brightness, contrast, color, and sharpness. Cropping, cloning, and other digital manipulation is not allowed in the traditional categories. This restriction on digital manipulation will enable folks who aren't as savvy at digital manipulation to compete on more-or-less even ground with those who are more experienced. " Unrestricted " categories have no such rules regarding manipulation.

Backscatter, Light & Motion, Adobe, and the Garden Island Resort here in Fiji all donated significant prizes, including copies of Adobe Photoshop CS and Premiere Pro, gift certificates for credit at Backscatter, Light & Motion housings for Olympus and Nikon cameras, and a 7-day trip for two back to the Garden Island Resort!

Details of all the entrants are at http://wetpixel.com/features/shootout2004

Best of show - Greg Bang

Traditional Macro - 1st Place: Ken Bailey



Unrestricted Macro - 1st Place: Marc Hannigan

Unrestricted Wide - 1st Place: Peter Mooney

Traditional Wide - 1st Place: Ken Bailey

Digital SLR Housings

For

Canon EOS Rebel

Canon EOS 300D

Canon EOS 10D

Canon EOS D60

Nikon D70

Nikon D100

Digital SLR Housing

To extend the capabilities of the digital SLR cameras Ikelite has designed a new underwater housing. This housing is injection molded of clear polycarbonate for strength, visual access to the camera, lcd screens and camera controls. The ergonomic design places camera functionality at your fingertips for the ultimate in creative control. The interchangeable port system accommodates a wide variety of lenses from super-wide angle to super-macro. The rubber handles offer excellent grip and a quick release system for Ikelite's new SA-100 Arm system. An external Ikelite connector is provided to connect single or dual Ikelite Substrobes.

Features:

- Clear Molded Polycarbonate
- Corrosion Free
- Interchangeable Port System
- Clear View of Info Window
- Clear View of LCD screen
- Most Camera Functions Available
- Weighted for Neutral Buoyancy
- Quick-Release Strobe Mounts
- Rubber Hand Grips
- External Connector for Substrobes
- Super-eye Magnifier for Enhanced Viewing with a Dive Mask.
- Weight 6.6lbs. (2.9k)
- Dimensions 7.5"L x 4.75"W x 7.25"H (19cm x 12cm x 18cm)

Underwater Housings for 8 megapixels

Canon Powershot Pro 1

Nikon CoolPix 8700
True TTL with
Ikelite Substrobes

Olympus C-8080
True TTL with
Ikelite DS Substrobes

Sony DSC-F828

Ikelite also offers a full line of housings for Non-SLR digital cameras. Beginner, amateur, or pro, simply get an Ikelite housing for your favorite digital camera. Choose from Canon, Nikon, Olympus or Sony, Ikelite makes housings for several camera models from each of these manufacturers.

Ikelite supports their underwater digital housings with a full line of accessories. Choose from trays with single or dual handle and quick release of strobes. The DS50 Substrobe is ideal for cameras with zoom lenses or choose the DS125 for use with wide-angle lenses. Many Nikon and Olympus models offer true TTL lighting exposure, or use our EV-Controller that gives 10 power settings in 1/2 stop increments for complete manual lighting control. Ikelite also offers a choice in versatile arm systems to meet your needs and budget.

New digital cameras are being introduced at a rapid pace. For the latest information on new digital housing models visit our web site.

www.ikelite.com

ikelite
Underwater Systems
50 W 33rd Street
Indianapolis, IN 46208
317-923-4523

New products

Ikelite Canon 10-D Digital SLR Housing

Compact new dSLR housing system is very realistically priced, features full capabilities, and operates safely to 200 feet depth.

All ports from our SLR systems can be utilized, allowing use of most macro, wide angle, and zoom lenses. This system allows you to see that the port is sealed.

The housing "O" ring seal is a masterpiece in fail-safe simplicity compared to designs that require stuffing the "O" ring into a groove. You can see that the "O" ring is sealed.

The heavy duty thick wall housing is molded of corrosion free clear polycarbonate. The Release Handle system allows easy attachment and removal of SubStrobe mounting arms at the touch of a button. Two screws remove the handle and tray assembly for traveling.

The housing size and weight provides neutral buoyancy and superb handling underwater. Camera installation is quick and simple. The dependable controls are conveniently placed at your fingertips, and kept water tight with Ikelite pioneered Quad-Ring seal glands proven to be the most reliable method for sealing controls.

The Ikelite Super-Eye magnifier provided with the housing offers enhanced viewing while wearing a diving mask.

For further details visit **www.ikelite.com**

ULCS Multi-Battery tester now available

This small 3oz battery tester tests your batteries under load. It computes the remaining power capacity using a 2-second pulse load test.

You'll have the confidence of knowing if your charging in a foreign country has charged your batteries to full capacity or how much power is left in your alkaline batteries.

Will test AA, AAA, C, D, NIMH or NiCd, alkaline, and 3 v photo lithium, or 9v. It runs on 4 AAA batteries.

This is a must have for your tool box at home or abroad and it costs just $29.50 plus shipping.

For further details visit **www.ulcs.com**

Fantasea CP-3.7 Housing for Coolpix 3700

Due to Launch in June/July

The CP-3.7 is purpose designed for the Nikon Coolpix 3700 camera.

There are 4 camera function control buttons including: Zoom/Wide Angle, Review,

The maximum operating depth is 40meters/130 ft.

Other Fantasea products include: Protective Bag, Dry Bag, Housing Tray Double, Housing Tray, Flex Arm 36, Flex Arm 24, Wide Angle/Macro Lens set. Digital Photo Light, Epoque Digital Slave Flash

For further information visit **www.fantasea.com**

Subal C1S housing for the Canon EOS-1DS

Subal is pleased to offer for the first time ever an aluminum housing for a full format digital SLR-camera; the professional Canon EOS-1DS. The Subal C1S housing is designed with attention to detail without compromise to quality and fuctionality. The camera is mounted on mounting saddle for precise camera positioning. The unique Subal Quicklock latching system makes it virtually impossible to lock the back housing plate if the o- ring is not placed correctly in the o-ring channel.

Threaded holes on the base and in the top shoe allows mounting of trays, aiming lights or other accessories. Generous shading of the LCD-monitor provides a bright and clear image. An excellent viewfinder optic provides full frame viewing.

All Subal ports with bayonet mount are compatible with the Subal C1S.

There are ontrols for: On/off, Shutter release, Manual Focus/Zoom, Front and Rear main Dial,Lens Release, LCD-light, Exposure comp, AE lock, focus Area Selector,Mode, AF-Mode, Exposure Metering System, Protect, Menu, Select, Display,delete, Quality, White Balance

2 x flash socket are provided (other options include : Nikonos, Ikelite, Subtronic S6 sockets. Please note that TTLmode is only available with S6 socket and Canon digital flash strobe)

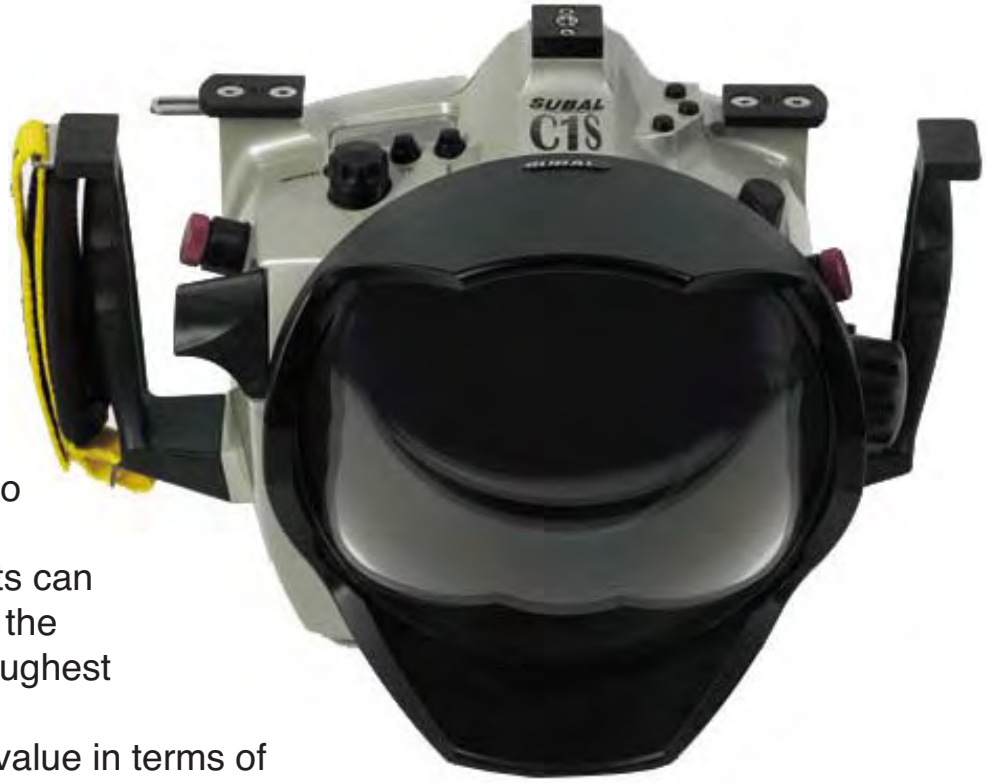
The housing dimensions are : 260mm x 230mm x 155mm (B x H x D), w/o handle and port and it weighs: approx. 2.7 kg with a maximum depth rating of 70 meters (210 feet)

For further details visit www.subal.com

Invest in success

Hard to believe, but Ocean Optics is nearly thirty years old. When we came onto the scene, the Nikonos 111 was state of the art and it didn't even have a built in light meter.

Now the state of the art is represented by digital SLRs with multi metering, autofocus, instant playback and able to shoot hundreds of frames per dive.



Subal C1S housing for Canon EOS-1DS

And, as always, we've played our part in ensuring our clients can choose from the best equipment available. Equipment made to the highest specifications to meet the demands of working in the toughest environment on earth.

Such equipment may not come cheap. But if you measure value in terms of performance and reliability, as we do, then it's an investment in your own success as an underwater photographer.

How do we know how to select the best equipment from an ever widening choice?

Nearly thirty years of experience.

Ocean Optics. Specialists in Underwater Photography.

Ocean Optics

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Tel 020 7930 8408
Fax 020 7839 6148

optics@oceanoptics.co.uk

www.oceanoptics.co.uk

Subal CG5 housing for Canon PowerShot G5

The combination of the Canon PowerShot G5 and the Subal CG5 continues Subal's drive to offer underwater digital photography to a semi-pro caliber. Generous shading of the LCD-monitor provides a bright and clear image.

There are controls for On/off, Shutter release, Command dial, Mode dial, Flash/Index, Exposure Metering System, Macro/Jump, Manual Focus, Manual Focus, Omni Selector, Set, Menu, AE-Lock/Delete, Function, Display

The dimensions are: 170mm x 145mm x 105mm (B x H x D), w/o handle and port. The weight is approx. 1.3 kg with the flat port and it is depth rated to 70 meters (210 feet).

For further details visit www.subal.com

Sea & Sea DX-3100 Aquapix recall

Sea & Sea have been informed by their R&D department of the possibility of cracks appearing in the battery compartment door or/and in the USB compartment door of the DX-3100 Aquapix amphibious camera that may lead to water leakage.

Although they have only received a limited number of these reports, even the remotest possibility of this condition appearing has prompted them to take affirmative and positive action and therefore we would like to request that you return your DX-3100 Aquapix to the Sea & Sea dealer where it was purchased, or to an official Sea&Sea distributor for testing and any necessary upgrading if within these corresponding serial numbers.

Corresponding Serial Numbers are : 030200001-030204016

Sea&Sea would like to apologize for any inconvenience this may cause you, and will make every effort to ship back your camera as soon as it can in cooperation with Sea&Sea official distributor in your region.

For more information visit www.seaandsea.com

Gates Sony VX2100/PD170 housing

Gates have announced a housing for the Sony VX2100/ PD170 video cameras.

It has a SWP35 port designed by Fathom Imaging which gives 110° coverage with full zoom through.

For more detail visit www.gateshousings.com

L&M Tetra 5060

The Tetra 5060 is a compact full featured housing that provides access to most camera controls in a user friendly layout. Housing provides access to the LCD screen for instant feedback and accurate subject composition.

The Tetra 5060 measures in at: 5.625" w x 3.625" h x 3.25" d and weighs in at: 3.5 lbs.

Tetra 5060 housing MSRP is $1599

For more detail visit www.uwimaging.com

The New Subtronic Mini.

Excellence Comes As Standard.

Do you take pictures or make them? Making memorable images is about imagination. It's seeing the image in a new light.

Controlling how light falls on your subject is something that Subtronic excel at.

For more than twenty years they've given the serious underwater photographer self contained studio lighting that lets you realise the limits of your own imagination.

The new Subtronic Mini has been three years in development. It's a minaturized version of the reputed Alpha, Gamma and Mega series guns. And, despite its compact dimensions, just over six inches long by three wide, its packs a punch. With a Guide Number of 22 it's quite a powerhouse.

Naturally it is TTL compatible with the Nikonos V, most housed Nikon film cameras and Fuji's digital S2. And for full creative control it has no fewer than four manual power settings. There's a built in TTL slave for multiple lighting set ups. You choose whether to use auto or manual exposure

A built in LED modelling light conveniently helps you confirm proper aiming. The built in Ni Cad pack offers fast recycling and minimal running costs. A fast charger with auto voltage switching and international plug adapters is standard.

All contained in and protected by a lightweight aluminium housing.

It's everything you'd expect from the worlds leading underwater flashgun designers. Only smaller.

These photos are life size!

Ocean Optics

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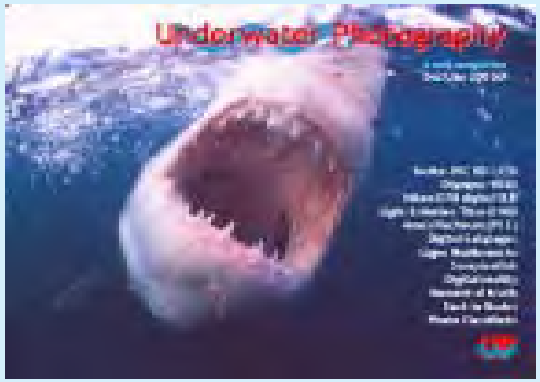

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Raki Raki

Fiji's Soft Coral Paradise

By Jeff Mullins

We began our descent from the dive boat to a shallow reef-top only eight metres below. This shallow reef was actually the top of a huge coral-encrusted pinnacle, rising vertically out of much deeper water. As we arrived, a pair of mackerel swooped in and began attacking a massive school of fusiliers that were sheltering around the top of the pinnacle, scattering the school in nervous fright.

Waiting for our dive companions to descend, we began exploring the shallow edge of the reef and quickly realised how rich this pinnacle was. A riot of coloured soft corals in bright pink, fiery-orange and blood-red lined the edge. Orange basslet fish danced above the soft corals and a big grand-daddy lionfish hovered gracefully along the edge. All this and we had only just left the surface!

This dive at 'Golden Dreams' was to be one of our favourites and is just one of dozens of sites that are dotted around the reefs offshore from the north coast of Viti Levu in the Fiji Islands. Viti Levu is Fiji's largest island and is where the capital Suva is located. We decided to dive off the northern coast around the district of Raki Raki as we had heard that the reefs here had pristine soft corals and marine life. Plus the area is only a two and a half hour drive by car from the International Airport at Nadi.

Raki Raki is a rural area with cane farming as its main industry, though many of the native Fijians are fishermen. Within a few kilometres of shore are a handful of islands surrounded by a maze of coral reefs, eroded with caves and swim-throughs. Further offshore in the Vatu-I-Ra Passage are reefs and pinnacles that offer World class diving. The offshore reefs have traditionally been

The reef crest at 'Golden Dreams' is a riot of colours, here a lionfish meanders through a field of soft corals. Canon AE1P, Sigma 28mm, Tussey T300 dome port, AquaSea 140 strobe & Slave, Velvia, f11 @ 1/60th.

(Right) The Cookie Monster was found in a small cave at 'Mellow Yellow' No touch-ups here, this is exactly how I found it. Canon AE1P, Canon 50mm macro, Tussey T300 flat port, Aqua Sea 140 & Slave, Velvia, f13.5 @1/60th.

The jetty area on Nananu I Ra island has a nice beach with two accommodations nearby. Canon T-70, Sigma 15mm lens, in natural light, 50 Velvia f8@ 1/125th.

Oni Beach at Nananu I Ra Island is a kilometre of uninhabited tropical paradise.

(Right) This tiny juvenile lionfish was found hovering among the shallows at 'Golden Dreams'. Canon AE1P, Canon 50mm macro, Tussey T300 flat port, Aqua Sea 140 & Slave, Velvia, f16 @1/60th.

accessible only from a few live-aboard dive vessels that ply these waters, but are now able to be dived from day trips operating from Raki Raki.

The largest of the offshore islands is Nananu-I-Ra; here a few chalet accommodations are located right on the beaches around the island. Two dive operators service the area, offering day trips out to the reefs. ***Ra Divers*** visit only the inshore sites within 30 minutes of Nananu-I-Ra Island. While ***Bamboo Reef Divers*** travel out to the open water reefs in Vatu-I-Ra Passage, around one hours boat journey from the island - plus the inshore sites as well. The really good news here is that diving is still in its infancy, new sites are still being discovered, so the area hasn't been dived to death!

Among the dozen or so dive sites the inshore area has to offer, all had interesting and varied reef profiles. Huge rocky reefs with vertical walls

(Left) The gorgonia ledge at a 'Dua Tali' a dive site everyone wanted to dive again, hence the Fijian name meaning 'Once More'. Nikonos III & 15mm, Aqua Sea 140 & Slave, Provia, f5.6 @ 1/60th.
(Above)The shallow reef-tops are often covered with anemones and Anemonefish. Canon AE1P, Sigma 90mm macro, Tussey T300 extended flat port, Aqua Sea 140 & Slave, Velvia, f16 @ 1/60th.

and eroded with caves, holes and ledges gives a feeling of exploring rather than just finning above the reef. Among our favourites reefs were -

Dream-Maker a collection of huge bommies sitting very close to each other, some reaching up from 25m to only 6m below the surface. Many of the bommies have swim-throughs, small caves and big ledges that are lined with gorgonian fans, soft corals and sea whips. Fish life consists mostly of smaller colourful species, though we did see white-tip reef sharks and a huge puffer fish here.

Golden Dreams {where this article begins} is a large area of interconnected bommies, with varying depths from 9m down to 25m. It soon becomes apparent where the name comes from; the sides of three big bommies are covered in golden soft corals. The balance of the bommies, plus the ridges and reefs that interconnect them, are coated in stunning soft corals in the deeper areas and huge plate corals in the shallower sections. We saw Lionfish on every dive here (including one tiny pale-yellow coloured juvenile) and hordes of basslet fish in the shallows. Coral Trout, sweetlips and snappers were always around.

The Maze is just that, a virtual maze of big reefs and bommies that have a mixture of gullies, caves, holes, canyons and ledges. Depths varied from 8m down to 23m and it could be easy to get lost here, but what a place to get lost! Some of Fiji's best soft corals line the walls and ledges and it seemed the prettiest corals were just below the boat mooring. We saw a large school of sweetlips, lobsters and some terrific nudibranchs here.

Breathtaker is located adjacent to ***Golden Dreams***, and is a group of bommies reaching up from a long ridge of reef that finishes abruptly at a steep wall falling to beyond 100m. This wall is the best place to see sharks around Raki Raki, white-tips are always found here, along with almost guaranteed sightings of whalers and black-tips. We also saw moray eels, schooling snapper, barracuda, mackerel and some great anemone fish.

Marama Totoka (Beautiful Lady) has some shallow reefs with stunning soft corals and swarms of anthias covering the tops of most bommies in only 6-8m deep. The

(Left) The shallow reef-crests are a mass of colourful soft corals surrounded by basslets. *Nikonos III & 15mm, Aqua Sea 140 & Slave, Provia, f13.5 @ 1/60th.*

(Right) Groups of Cling Gobies inhabited most gorgonia fans on the offshore reefs. *Canon AE1P, Sigma 90mm macro, Tussey T300 extended flat port, Aqua Sea 140 & Slave, Velvia, f22 @ 1/60th.*

bommies come out of 12-15m of water, though there is some deeper water on the outer extremities of the bommies, where we explored ledges and small caves.

The reefs further offshore from Raki Raki in the Vatu-I-Ra Passage offer some beautiful dive sites. These are all open ocean dives on pinnacles that rise from phenomenal depths, we visited in a period of strong south-easterly winds but were still able to dive some of the best sites in fantastic underwater conditions. The best that we saw were -

Black Magic Mountain is a solitary pinnacle starting at 7 metres with almost vertical walls. One side has a ridge leading away at 27 metres, but around the rest of the small pinnacle, the bottom was out of sight. The entire reef was covered in soft corals and gorgonian fans, pelagic fish action was non-stop, a huge school of surgeonfish and fusiliers hung just off the reef. Trevally arrived in bursts, sending the fusiliers into panic on each pass. A school of barracuda hovered at the edge of the ridge, and on the reef were coral cod, sweetlips, plus thousands of basslets surrounded the soft corals - what a dive!

G-6 was a heart pounding drift around a double-topped pinnacle with a shallow channel through the middle. The current here keeps the fish life very active. Grey reef sharks hover over the sand beyond 30 metres, while big schools of fish paraded past. The reef has a series of ledges from 8 metres down to 25 metres on one face and vertical to 40 metres on another side. Soft corals were everywhere and one big overhang was 'dripping' with the bright yellow *Siphonogorgia* soft coral.

Garden of Eden had a reef just a meter below the surface, this dropped vertically to between 10-18 metres where the bottom sloped out to deeper water. The wall has a series of large crevices running into the reef face, these can be entered carefully to view huge gorgonian fans and soft corals. The deeper slope has beautiful small bommies where soft corals are surrounded by thousands of basslets. We also saw parrotfish, scorpion fish and a group of waloo that cruised past checking us over.

Mellow Yellow is a shallow bommie connected at about 18 metres to a deeper bommie, both of them are coated with a bright yellow soft coral. This reef had lots of interesting macro life; dragon nudibranchs, a small anemone with a dozen anemone fish darting around, scorpion fish, painted oysters, angelfish, leaf fish and lots of coral cod in

the crevices.

Pot Luck is adjacent to ***Garden of Eden*** and is the corner of the same reef. We loved this place as it had very little current, but buzzed with life. Lots of ledges and mini caves to explore, and ridges loaded with gorgonians and soft corals all in full bloom. We swam around the corner into a howling current, turned around and just hung-back around the area where all the action was - without the current. Finds here included ghost pipefish, big sweetlips being cleaned, a turtle, beautiful gobies, nudibranchs, leaf fish plus all the usual reef fish meandering around.

On our non-diving days we went beachcombing and exploring mangroves along the shore or just walked around the island. Day trips are available to the mainland to visit waterfalls; traditional Fijian villages or the once-a-week market on Saturday's at Raki Raki township is highly recommended.

One of the greatest attractions we found in Fiji was the native Fijians themselves. We had heard many accounts from visitors to Fiji before our inaugural dive trip. Yet one comment in particular stood out, because everyone we spoke to told us the same thing - The Fijian people are great, you'll find them so warm and friendly. Well we certainly weren't disappointed, after two trips here we concluded that the Fijian people were the friendliest we had ever met, most of them treating us like old friends after only meeting them for a few days or even hours.

(Above) The reef-top at the 'Pinnacles' has many varieties of anemonefish. *Canon AE1P, Sigma 90mm macro, Tussey T300 extended flat port, Aqua Sea 140 & Slave, Velvia, f19 @ 1/60th.*

(Right) ***The vertical walls of Black Magic Mountain are home to schooling surgeonfish, fusiliers and basslets.*** Nikonos III & 15mm, Aqua Sea 140 & Slave, Provia, F5.6 @ 60th.

The best time of year to visit is from May through to November, when rainfall is least and sunny days prevail. Underwater visibility is often over 30 metres on the offshore sites, while inshore is between 10-20 metres. Diving is possible in the rainy season (December to April), but underwater visibility can be restricted, particularly on the inshore sites.

Dive Operators in the Raki Raki area are;

Bamboo Reef Divers - are based at Bamboo Beach Resort on Nananu-I-Ra Island. e-mail info@bambooreefdivers.com or web address is www.bambooreefdivers.com

Ra Divers - are located at Wananavu Beach Resort. e-mail radivers@is.com.fj or web address is www.radivers.com

Places to Stay*;*

On Nananu-I-Ra Island;

Bethams Beach Cottages and

The offshore reefs have been eroded by wave action, forming caves and ledges, where soft corals corals thrive. Nikonos III & 15mm, Aqua Sea 140 & Slave, Provia, f8 @ 1/60th.

McDonalds Nananu Beach Cottages are both self-contained chalet accommodations, right on a beautiful beach. Both have a small restaurant and shop to purchase food and essentials, plus they arrange boat transfers to and from the mainland. They also have back-packer dormitories. Web Address for Bethams is http://www.bethams.com.fj/.

A resort high on the island's hilltop was being refurbished during our last visit, ***Bamboo Beach Resort*** (formerly the Mokusigas Island Resort) opened in March 2004 under new American ownership with its own dive operation (see above).

On the Mainland;

Wananavu Beach Resort is located on the mainland, on a peninsula just across the water from Nananu-I-Ra Island. Though the resort has full facilities with nice rooms, great food and a pool - sadly the beach is unattractive mud.

Jeff Mullins

Jeff is a freelance photo-journalist residing in Perth, Western Australia. Jeff's first article was published in 1979, in Skindiving in Australia magazine. His works have since been published widely in other dive related magazines including; Ocean Realm, Sportdiving, Asian Diver, Scuba Diver, Discover Diving, GEO, Dive Log Australasia, plus various airline in- flight magazines, newspapers and travel publications.

Jeff self-published his first book *Dive Western Australia,* in 1993. His book credits include *Australia Down Under, Dive Australia*, *Atlas of Australian Dive Sites & Top Dive Sites of Australia*.

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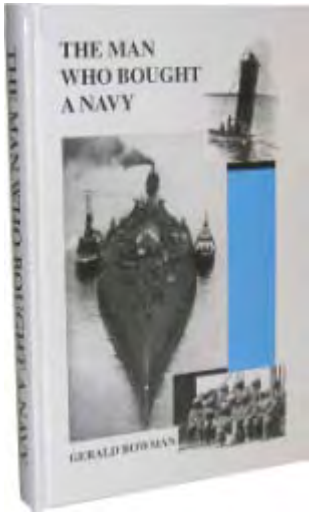
The Man who bought a Navy



Pieced together after much research and told for the first time in this autobiography is the astounding story of what is regarded as the greatest achievement in the history of marine salvage - the raising of the German Fleet at Scapa Flow.

The Man who bought a Navy contains 249 pages and has over 100 photographs.

Copies cost £19.95 (+£3 UK postage) *To order your copies, contact* PR Productions. Tel 44 (0)20 8399 5709 or email peter@pr-productions.co.uk

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Concern in the Galapagos

A report from Sea Shepherd
Captain Paul Watson

The Sea Shepherd conservation research ship ***Farley Mowat*** arrived in Puerto Ayora, Galapagos on the morning of May 6, 2004. As the ship was clearing Customs and Immigration, a fishing boat passed close by, escorted by Park rangers. On the deck were a number of recently slaughtered Galapagos sharks.

It was a timely arrival. It was the eve of a threatened strike by fishermen that promised more violence against the National Park. The fishermen who have already laid waste to entire areas of sea cucumbers demanded an extended season to further exploit the surviving numbers of the species.

At one dollar an animal, and with the demand climbing from the Asian market, the sea cucumber has been under intense pressure from exploitation for many years. As the numbers decrease, the demand and the price increase.

The Galapagos National Park is very much aware of how dangerously threatened the sea cucumber is. Each year, hundreds of thousands of these small creatures are confiscated from poachers, unfortunately all dead.

In preparation for the strike, the rangers had strung up barbed wire barricades at the Park office entrances on Santa Cruz and Isabela Islands.

Eighty fishermen marched through the streets of Puerto Ayora on the morning of May 7th , brandishing signs and loudly screaming through megaphones for the government to give them what they wanted.

And what they wanted was to take more than the biologists considered ecologically safe to take. In fact the biologists had warned that none was too many!

The decision was to be made at noon on the mainland in Ecuador.

Out at anchor, the crew of the ***Farley Mowat*** saw a large Ecuadorian tuna seiner, the ***Rocio*** enter the bay, it came straight towards us. Her shape was familiar, similar to the dolphin killing tuna seiners we have long clashed with in the Eastern Tropical Pacific.

She circled, took aim at us and then dropped her anchor as close as she could. Her crew were jeering and when spying our female crewmembers began to make obscene

Out at anchor, the crew of the **Farley Mowat** *saw a large Ecuadorian tuna seiner, the* **Rocio** *enter the bay, it came straight towards us. Her shape was familiar, similar to the dolphin killing tuna seiners we have long clashed with in the Eastern Tropical Pacific.*
Photo right ©2000-2004 Bonnie Pelnar

A Park Ranger examining confiscated sea cucumbers. (Sea cucumbers are related to sea urchins and starfish.)

gestures.

According to the Park rangers, the tuna seiners were claiming a medical emergency although we witnessed no one being removed to shore for medical care. One of the rangers confided in me his suspicion that they were in the Bay to support the strikers.

At noon, the strike did not materialize. The government in Quito had capitulated to the fishermen's demands without resistance and had

As the ship was clearing Customs and Immigration, a fishing boat passed close by, escorted by Park rangers. On the deck were a number of recently slaughtered Galapagos sharks.

allocated to them the extension and the quota they were demanding. Forty five days to loot four million pepinos (sea cucumbers) from the sea. Despite this there was grumbling among the fishermen that they should have demanded more.

On the conservation side the feeling is that none is too many. On the exploitation side the position is that four million is not enough. This alone illustrates the vast chasm between nature defenders and nature destroyers. And for those who say that I reveal my bias when I call the fishermen destroyers, I say come to the Galapagos and see for yourself how subsistence has been replaced by systematic plundering of the seabeds for pepinos and ruthless looting of the marine reserve for shark fins.

Both sharks and sea cucumbers are being exterminated to satisfy the insatiable demand for shark fin soup and sea cucumber delicacies in Asia.

The tuna seiner left Admiralty Bay later in the afternoon but not before our crew witnessed them smuggling a boatload of large fish ashore in the daylight within full view of the Port Captain's office.

As the sun set in the evening of May 7th, I contemplated the changes that I have seen in these islands since we first began our project in 2000.

Four years ago, the town of Puerto Ayora was quiet, prices were low, there was one internet cafe, and a policy that a car could only be brought to the island if an old car was removed. Marine iguanas sunned themselves on the sidewalk, blue footed boobies dove into the Bay by the score, lava lizards and red crabs scurried excitedly over the shore rocks, frigate birds circled the town on thermals.

The first telephone was installed as recently as 1993. Today the U.S. company, Bell South is well established with pay phones, internet access and cell phones.

I have watched each year as the town has grown with migrants from the mainland arriving every day. There are three times as many cars and trucks and four wheel all terrain vehicles roar down the street and into the bush. Whereas TAME airlines once flew to the island every three days, there are three TAME flights from and to the mainland every day. A second airline AeroGAL has also begun operations to the mainland. There is no problem finding an internet cafe, restaurants and hotels are plentiful, and the menus boast of seafood cornucopias ranging in diversity from shellfish, lobsters, grouper, tuna, barracuda and shark. The hillsides of the islands breed cattle and goats to provide the restaurants with meat.

Last year, a record of 95,000 tourists visited the Galapagos. The number is expected to be greater this year.

We are witnessing the Hawaiianization of the Galapagos.

A society is evolving that has four distinct divisions. There are those who are here to protect the Park and the Marine Reserve and to pursue the objectives of science. This includes the Park rangers, the scientists at the

Many express surprise when informed that between 20,000 and 30,000 people now live in the islands. The first telephone was installed as recently as 1993. Today the U.S. company, Bell South is well established with pay phones, internet access and cell phones.

Darwin Research Center and representatives of non-profit organizations like the Sea Shepherd Conservation Society and WildAid.

The second group are those who are employed in the tourist industry. This includes licensed guides, scuba diving, guided tours, eco-tourism boats, restaurants, hotels and internet cafes. Amongst the guides there are two categories. The first are the guides who are involved because of their love and their passion for nature. The second category are relatively new guides from the mainland who see profit as their first priority.

The third group are the fishermen. This group can be divided into the original subsistence fishermen and the much larger group of recently arrived migrants from the mainland of Ecuador who see the islands as a temporary place to plunder before returning to South America. It is these fishermen who are causing the most damage to the resident species and it is this group that is spearheading the destruction of the Galapagos.

The fourth group is the Ecuadorian military.

Most of the rest of the world if they think of the Galapagos at all envision a natural paradise populated with giant tortoises, magnificent iguanas and unique species of birds. Many express surprise when informed that between 20,000 and 30,000 people now live in the islands, that there are a half a million feral goats on Isabela Island, that the baby tortoises must be captured and raised at the Park station until they are large enough to be returned to the wild when the rats can no longer threaten them.

They would be surprised also at the number of dead iguanas lying dead after attacks by domestic dogs and cats, at the number of chickens running around competing with wild birds for food and the number of small birds lying dead on the roads where hundreds are struck down every day by cars, trucks and buses.

And they would be horrified to witness the number of shark fins routinely confiscated from poachers, of Galapagos seals mutilated for their genitalia to be sold to the Asian markets, of dead hammerhead and Galapagos sharks decomposing on the bottom of dive sites after having their fins ripped off while still alive and then tossed back into the deep to die a slow death.

The Galapagos are in serious trouble and under heavy assault by those who see these enchanted isles as nothing more than a place to be exploited for profit.

The Sea Shepherd Conservation Society has been working to support the efforts of the Galapagos National Park for four years now. Our contribution of the fast patrol vessel ***Sirenian*** has led to the intervention and capture of numerous illegal fishing activities.

The ***Sirenian*** is supported by the patrol vessel ***Guadalupe River*** and a third vessel the ***Sierra Negro*** is being built to reinforce the enforcement fleet.

But we need to do more. The Parks need materials, equipment, law enforcement instruction and of course - money.

The Galapagos National Park and the Galapagos Marine Reserve are World Heritage sites and the responsibility for the protection of these incredible islands must be an international effort.

The Sea Shepherd Conservation Society is pledged to continue to devote time and funding to the Galapagos. It is our line in the sand. If we cannot save the Galapagos, how can we save the rest of the world's threatened places?

Sea Shepherd Conservation Society welcomes your support.

To learn how to support our conservation work, please visit: www.seashepherd.org/donate.shtml .

Remotely Operated Photography

By Alexander Mustard and Daniel Jones

On average, the ocean is 3800 metres deep. It covers 71% of the earth's surface and 88% of it is deeper than 1000m. I've never been able to comprehend such a volume of water, such a volume of habitat. As a diver I rarely take photos deeper than 30m, that's less than 1% of the average depth. Technical divers are a bit more adventurous than I am and they may take pictures as deep as about 100m, which is not even 1% of the maximum depth of the ocean. It's fair to say that diving photographers are only just scratching the surface.

We humans are visual creatures, 40% of the sensory inputs to our cortex are from our eyes. We also have an inexorable curiosity about the world around us. So just having images from the top 1% of the ocean is fundamentally unsatisfying! Marine scientists have been bringing back images from the deep for many years, but they have always been scarce. Submersibles are expensive and time aboard is always short, which rarely gives time to create high quality images when science is the priority. Lowered, towed and fixed camera systems are preset and fire autonomously and are excellent for time lapse sequences. However, these systems offer no chance for intervention by the photographer, and basically rely on chance to create an interesting image. The real change for deep sea photography came with the proliferation of remotely operated vehicles or ROVs that offer real time control of both the vehicle and the underwater camera system and can work right around the clock.

As the Oil and Gas Industry has explored further offshore, they have invested in a large ROV fleet for both exploration and routine maintenance. The lengthy trip that ROVs make to and from the surface uses valuable time, so in a normal working day many of these vehicles sit idle on the seabed between jobs. A new scientific project, SERPENT, hosted at Southampton Oceanography Centre, has been set up with partners in the offshore industry to make the best scientific use of this ROV standby time. The SERPENT project has also enabled the scientists to bring back some really

An ROV being launched. North of Scotland.

This eelpout lives in very cold deep water (-2-5 C) and feeds on brittle stars. It grows up to 75cm long and was photographed at 600m depth. North of Scotland. Kongsberg oe14-208 camera. 14.4mm lens. 1/250th @ f4.5.

A discarded barrel attracts a ling, an Echinus urchin and a basket star. Photographed at 350m depth. North of Scotland. Kongsberg oe14-108 camera. No other details available.

exciting new images from the deep ocean.

Technologically the real breakthrough for ROV photography came with digital cameras. The LCD screen frees the photographer from actually having to be down there looking through an optical viewfinder. There is no reason why the LCD screen needs to be down there with the camera. Instead the preview images are passed to the surface via a fibre optic line in the umbilical cable that attaches the ROV to the surface. The umbilical can be up to 10km long for deep water work. The camera control commands can then be returned to the camera back down the umbilical.

ROV photographic equipment is still fairly bespoke, so here we will describe the ROV and camera configuration that we used on the latest SERPENT mission in 600m of water in the Faroe-Shetland Channel. The study area was on the east bank of the Channel, 180km north of Scotland, UK. The seabed here is scattered with ice rafted material: gravel, sand and boulders dropped of the underside of icebergs as they melted. This material was most probably deposited here during the last ice age, since there are no icebergs these days! The water temperature at the seabed is very cold though, ranging from -1.9 to +1 C.

The camera equipment is actually pretty much the same as shallow water kit. The main difference is the housing, which needs to be able to withstand the great pressure, but obviously does not need buttons, levers and dials for manual control. Typical of most deep ocean instrumentation, the housing is a metal cylinder, with connectors at one end and a glass window at the other. The camera we used was Kongsberg Simrad's new oe14-208 digital colour

The next stage of the SERPENT project will be to take still images of more unusual species in deep water. This rattail was filmed on video at 3000m depth. Gulf of Mexico.

Kongsberg camera system on the pan and tilt arm. The camera housing is top right, and the flash tube is bottom left. Also mounted on the arm are colour video camera (top left), a low light video (bottom right) and a pair of video lights (right at the bottom),

still camera housed in a 3000m rated titanium housing. The camera is based on a normal digital camera, but is built into the housing to use the space most efficiently. It has 5 megapixels, a 4 x optical zoom, and is capable of shooting over 200 images between downloads.

Controlling the camera is very easy with the Kongsberg GUI (Graphic User Interface) run on a laptop. The GUI gives us access to all the camera's controls, without any noticeable delay. Lighting was provided by a single Kongsberg oe11-242 flash housed in another 3000m rated titanium housing. The flash power output is controlled from the GUI in 1/3 of a stop increments up to a maximum of +2 and down to a minimum of -2 stops. In practice it was often easier to adjust the camera's aperture to ensure a good exposure than the flash. There is no ambient light at these depths, so the shutter speed is pretty irrelevant and is set to the fastest synchronisation speed.

Both the camera and flash are mounted on a hydraulic pan and tilt unit on the ROV that controls their position and aiming. However since both are on the same unit, the flash cannot be positioned independently from the camera. Another shortcoming of this system is that the camera is about 70cm above the seabed, which means it is not possible to get eye level shots of benthic critters. The pan and tilt unit is operated by joystick, but being hydraulic the fine movement can be frustratingly jerky especially when the lens is zoomed in for close-up shots. Surprising as it sounds, it is often easier to reposition the ROV by a few centimetres with its thrusters than to make fine movements with the pan and tilt! The ROV and the skill of its pilots are obviously crucial to getting good images. One of the most important skills of an underwater photographer is having the stealth of a

Northern shrimp and brittlestars climb up on sponges to get into the current to feed. Photographed 600m depth. North of Scotland. Kongsberg oe14-208 camera. 23mm lens.

hunter. A slow and careful approach is essential to get close enough to a subject to get a good image without scaring it off. Next time you spook a fish with a rushed approach underwater imagine what it would be like trying to creep up on it in something the size of a car! Producing good images from an ROV are probably more reliant on the pilot's skills than the photographer's.

In addition to stealth, the behemoth sized ROV causes hydrodynamic problems such as a bow wave and wash from the thrusters, that can transform the muddy seabed into a blizzard in seconds. We usually approach subjects into the current, so that sediment disturbed by the down thrusting of the ROV does not wash into the frame. Repositioning the vehicle in this way for each subject is not always easy and it can take several minutes for the visibility to clear enough for photography.

The main aim of this scientific photography is to identify the species living in these areas and to learn about their ecology and behaviour from our observations. We can also collect quantitative data by using the images as quadrats or by making video transects, which complement any experimental work we are doing. The SERPENT project has already achieved many first time observations of animal behaviour in the deep sea. Creating the best possible images is important because clear, sharp, correctly exposed images reveal much more information. Strong images are also a great benefit for publicising our science. The great size and depth of the ocean offers a vast volume of water as potential habitat for life. In comparison to the thin veneer of terrestrial life the ocean represents more than 99.5% of the inhabitable space for life on our planet. And this is the 99.5% that we know least well. Lil Borgeson and Jack Spiers, in the Skin Diver Handbook published in 1960, point out how ingrained our unfamiliarity with the ocean is;

"Our language reflects the uneasy awe we feel towards the unknown world which covers most of the planet. When something is beyond our understanding we say it is 'too deep' or that 'we just can't fathom it'." As ROVs bring back more images they are helping us get to know the deep ocean that bit better.

Alexander Mustard and Daniel Jones.

www.serpentproject.com

We would like to thank the ROV crew on the Jack Bates Tony Church, Chris Combe, Rob Dunn & Duncan Miller and Tony Kastropil on the Discoverer Deep Seas, Transocean, Subsea 7, TOTAL E&P UK PLC, Dr Ian Hudson, the SERPENT Project and Southampton Oceanography Centre.

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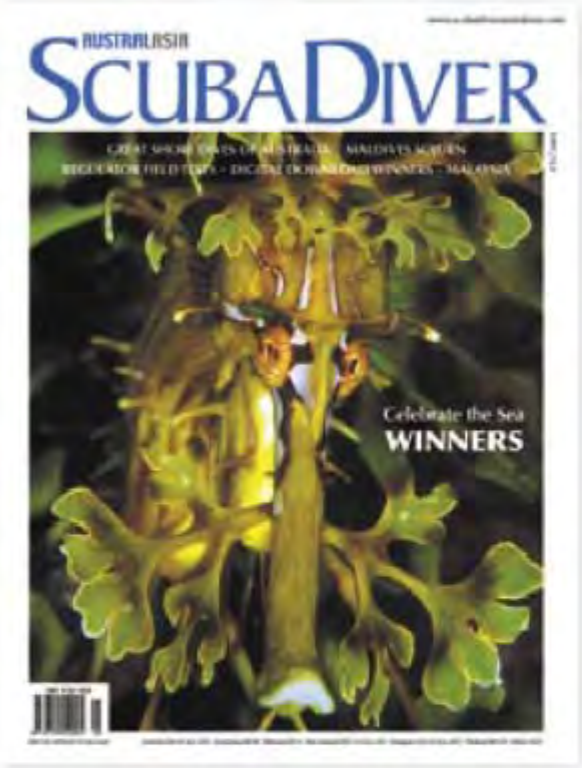

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“Look Mum! No bubbles”

by Sascha Schulz

All photos were taken using an Olympus C5050Z with PT-015 housing, no external strobes.

Most people learn to snorkel before they take up Scuba diving, yet relatively few explore the full potential of breath-hold diving. Freediving is exactly that, a diving experience free from constrictive harnesses, tanks and decompression tables. There is of course the small problem of having to holds one’s breath in order to get down to play with the fish.

Perhaps the biggest difference between photography carried out on scuba, and that done whilst freediving, is the time constraint imposed upon the photographer by his own physical limits. It simply isn’t possible to wait for 15 minutes to get that perfect shot. The freediver must take the first shot offered, regardless of his body position or picture composition. Even with 1-2 minutes bottom time it is

extremely unusual for myself to take more than 3-4 photos on a single dive. Yet over a 3-4 hour period that can equate to well over a hundred photos. What is lost to time constraint can be regained by the sheer volume of photos possible. In the scuba community the common saying is “plan the dive, and dive the plan”. In sharp contrast, a freediver can wander from the shallows to the deep walls and back again without worrying about surface intervals or decompression. The degree of freedom that entails means the photographer can chose his locations, and quickly abandon an area that proves unfavorable to photography.

Buoyancy is another issue of importance to the freediver. At best the neutral buoyancy region is about 2m worth of the water column, yet photo opportunities commonly range from 1m down to 20m. In the shallows a steady shot becomes particularly challenging, as waves and swell conspire against the diver. At depth the problem lessens, but lying on a coral reef, for example, creates other problems. A good portion of the dive can be spent figuring out how to get into position for a shot. I like to stay away from the subject and plan the approach, shot framing and lighting before descending. This equates

to a more focused dive and ultimately a better quality photo in the bag. Yet even the best planned dive can go horribly awry when the subject refuses to co-operate. The Blotched Hawkfish photo was taken whilst I was upside down, with my legs firmly wrapped around a pylon to counter the surging swell. Whilst this may seem extreme, a scuba diver would have had no chance of staying in the position required for the shot due to the extra weight of the scuba equipment.

At greater depths, from 10m downwards, the ambient light is low enough that a strobe is almost mandatory. But a strobe arm and strobe both adds weight and reduces the hydrodynamics of a diver, two things certain to make a smooth ascent a lot harder for a freediver. The extra weight issue can be resolved by adjusting one's weightbelt, but the cumbersome strobe arms are another matter. I prefer to dive without strobes, instead using slower shutter speeds and paying more attention to the natural lighting opportunities to make up for the handicap.

Many times I have dived the same sites as a group of scuba divers, and ended up with vastly different photographic opportunities. Missing out on some of the more difficult to approach subject is quickly compensated for by the opportunity to photograph inquisitive pelagic species. Many species of fish, particularly pelagics, will approach divers floating on the surface, whilst those below never even see them.

The advent of cheaper digital cameras has made freedive photography more attractive. Having started my photographic career using a Nikonos 4A I was often disappointed in the quality of shots and usually kept one or two shots per roll of film. The relative expense of each photo made the experience less enjoyable too. I now shoot an Olympus C5050 digital camera and have watched my skills improve in leaps and bounds. The ability to judge each shots merits the instance it is taken, and the seemingly endless memory capacity of my 1Gb mini drive, means that I can take photos of a subject until satisfied with the quality. This also means that experimenting with different shutter speeds, apertures and shooting modes is inexpensive and rewarding. Any freediver wanting to take his photography to the next level should consider a digital camera first, a film camera second.

A note of warning to finish upon: Freediving is a dangerous sport. Anyone wishing to undertake photography, whilst freediving, should be aware of hazards such as Shallow Water Blackout. No photo is worth your life, so take the time to inform yourself and always dive with a buddy.

Sascha Schulz

Back to Basics

By Alexander Mustard with Giles Shaxted

Like most people, I have a love hate relationship with technology. Technology allows me to do things that wouldn't have dreamed possible a few years ago. I am currently in Grand Cayman and while I've been here I've been able to plug my laptop into the phone line in my hotel room and download UWP 18. Frankly, I think its very cool to be able to pick up the magazine while I'm away and have time to read it and put the latest tips into practice. If only my other magazine subscriptions followed me round the world! Anyway, I thought that Deb Fugitt's pike blenny reflection photo on the cover was fantastic and took a moment to send a quick email to the Editor to tell him. So where's the bad side of the technology? Well, Peter has a quick and devious mind and moments later my computer was flashing up that I had mail. Clearly keen to stop me enjoying my vacation, the Ed had a suggestion for an article. Here is an extract from his email "I think our readers would be interested in seeing shots taken with the most basic equipment. Some complain that's it's all very well for your contributors with their expensive equipment...". So that is what this article is about. Going back to basics, in terms of the technology of underwater photography, and asking the question "Do we really need the most expensive and advanced technology to capture a range of pleasing underwater images?"

The plot

Fortunately, I happened to have the ideal tool with me: an Olympus C220 digital compact camera and PT-013 housing. This is about as simple as UW digital gets! The box lists its fantastic features: 2 megapixels and 3x times optical zoom and that's it! The camera was donated to YUP - the Young Underwater Photographers' Group (www.yup.digideep.com) by Ocean Optics and is shared between the members. I had brought it to Grand Cayman so that fellow YUP member Giles Shaxted could try it out. Giles, who has previously worked as the photo-pro at the well known dive centre Fisheye, and has been shooting digital underwater since before I knew what a megapixel was, seemed an ideal accomplice for this project.

Giles with the little Olympus! The camera is tiny compared with the twin strobed

To keep the technology basic, we chose not to add an external flash or any of the supplementary lenses that are available, using the camera in its most basic form. The whole thing is tiny, small enough to slip into a BC pocket when either of us was shooting with other cameras. We also thought it would be unfair if we took the camera repeatedly to the most exotic dive sites in Cayman, diving endlessly until we had perfect shots. So we decided to use it only when we were shore diving, and in total made 5 dives and one snorkel trip! Oh, and we only dived it on Fridays - Giles's

Macro shooting is usually handled very well in fully automatic mode. The large, well shaded LCD screen makes it easy to accurately select an interesting composition. Olympus C220. 5mm lens. 1/100th @ f13. Automatic (GS).

The night-time flash mode was used here to lengthen the exposure time and balance the ambient light with the flash-fill on the Scorpionfish. Olympus C220. 5mm lens. 1/25th @ f8. Automatic (AM).

day off! Finally, we decided to limit our use of Photoshop in preparing the pictures you see here to auto-levels, minor backscatter removal and sharpening after resizing.

The evaluation

Both of us are used to cameras that offer much more flexibility and control, so we were sure that our photography with the C220 was going to be limited by its technology. Its lens covers a standard mid-range, ideal on land, but neither wide enough for scenery nor tight enough for macro underwater. And its flash, coming from within the housing, is ideally placed for lighting up backscatter and not powerful enough to illuminate large subjects. The other major limitation of many digital compacts is shutter delay - a seemingly endless period of time that starts when you press the shutter, and waits until the fish has swum away before actually taking a picture. Clearly this was going to cause problems with moving subjects. That said, we felt the best evaluation was to try to take all the different sorts of images that we would have done using our more usual mounts; the sorts of images that any owner of this sort of camera would want to take. Below is a list of the 5 types of shots we decided to try, starting with the easiest, technically speaking, and finishing with what we considered nigh-on impossible:

1) Close-up, flash-lit image of a slow moving subject

2) a fish image illuminated with a balance of flash and ambient light

3) a wide angle scene

4) a moving animal behavioural image

5) a split level shot

Close-ups with flash

Sitting on the benches outside the Dive-Tech shop at Turtle Reef, before our first dive, we decided to start by playing to the camera's strengths and shoot close-ups lit with the camera's flash. Small camera to subject distances would reduce backscatter and allow the internal flash to illuminate the subject, and the single light source (the flash) would be easily controlled by the camera's metering. We started using the classic approach of shooting from as close to the subject as possible (with the close-up function turned on) often with the lens zoomed out to get the subject in the frame. This worked well. Sometimes, at such close distances the flash would overexpose the subject, despite its auto control. The exposure can be compensated through the menus, but this is a bit fiddly to do for each new subject and we mostly used two other approaches. The first was to increase the flash

to subject distance, by moving back a bit and zooming the lens in to get the same shot. The second approach, that I favoured, was to slide my finger across the flash a bit, cutting off some of the light. I know that sounds crude but it worked really well and can be done very quickly. Despite what I have said above, the camera performed much better than we expected and from our first shots the pictures were correctly exposed and well lit. The lens was not really capable of true macro, smallest area the camera could photograph was about the size of a postcard, but I am sure that a supplementary lens would solve this.

Balanced light fish photography

After a long photo-dive it was very pleasant to get out of the water, have a shower and warm up in the suntrap behind the dive shop. Soaking up the rays, we decided that although we could continue with the close-up technique and produce a large number of pleasing pictures we had to forge on and next on our list was fish photography. This, we felt, would be a high priority for most photographers. A lot of fish photography can be done with the macro technique, but to make things a bit tougher we wanted balanced light fish pictures - flash lit shots with blue backgrounds that show the fish as they look underwater. Achieving balanced light is an area where we thought we would expose the limitations of a predominantly automatic camera that does not provide the differential manual control of ambient light and flash exposure. In UWP 18 I wrote that we either need wide apertures or long exposures to

Again a long exposure, produced in auto using night-time flash mode, has produced a pleasing blue background with this French Angelfish. Olympus C220. 5mm lens. 1/15th @ f8. Automatic (AM).

get nice blue backgrounds in all but brightest, shallow water. The easiest way to get blue backgrounds with the Oly was to shoot slightly upwards increasing the amount of natural light coming into the camera, and to lengthen the exposure using the night scene flash mode. This is a slow flash synch mode, where the camera slows the exposure time down to correctly exposure the ambient light. Slow moving fish like scorpionfish were now easy. The problem with most fish is that they swim, and this makes them much more tricky to shoot with a camera with significant shutter delay. Half pressing the shutter as you are framing the shot cuts the delay in half, but it is still considerable and there are no miracle cures. Therefore fishy images need to be planned; I guess it is a bit more like shooting a Nikonos for fish photography than zapping free swimming fish with the rapid autofocus of a modern SLR.

Picking the right subject is the key to success: territorial fish tend not to move about too much. Alternatively, look for fish that are busy doing something. The French Angel, pictured, was busy stuffing its face with a sponge. So while not everything is possible with shutter delay, get the right fish at the right time, use night flash mode and fish shots with blue backgrounds become point and shoot simple.

Wide angle scenery

A big bowl of pasta later we relocated to Sunset House for afternoon and evening dives. Discussing our progress over a chilled beverage, we knew wide angle was always going to be a tough challenge without a wide angle lens! In order to fit the entire subject into the frame we would need to back away. But this would cause two problems. First the extra water between the camera and the subject would reduce the clarity of our images. And second the longer light path would mean we had no hope of lighting the subject with the internal flash of the camera. Indeed, shooting through so much water, and with such a small distance between lens and flash seemed a perfect recipe for backscatter. It was clear that the only pleasing scenic images we

The internal flash is only going to light up backscatter and not the main subject, so for wide angle it is best to shoot with only available light. Shooting in black and white is a good way to disguise the lack of colour! Olympus C220. 5mm lens. 1/60th @ f2.8. Flash Off (GS).

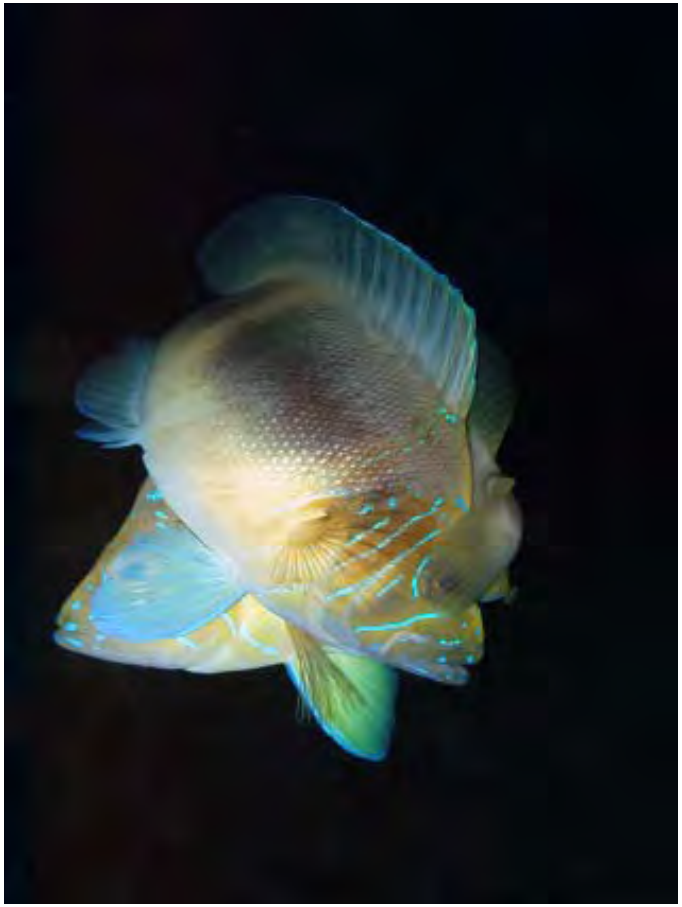
could get would be with available light.

In shallow water (less than 5m) we found that the auto-white balance of the camera allowed us to produce reasonably colourful shots. We could have added coloured filters to help us take coloured images deeper than this, but we felt that filters were not basic equipment and chose not to use them. Instead, deeper, we concentrated on monochrome images. Underwater images can look particularly striking in black and white, especially when you use the direction of the available light advantageously when composing the shot. In generally light underwater downwells from above. Often a slightly downward camera angle makes best use of ambient light to achieve even illumination of the subject. The Olympus has both Black and White and Sepia-toned monochrome modes, but if these features are not available their effect can be easily achieved afterwards in Photoshop.

Behaviour

One of the projects I was working on in Grand Cayman was photographing reef fish spawning, particularly that most Caribbean group of fish the Hamlets. I was keen to get as much time with the fish as possible so I did a deal with Giles: if he would waste a couple of Friday nights watching fish instead of hitting the apres SCUBA, I would come out for a beer later in my trip. Seemed like a good deal to me! Not many people have watched hamlets spawn, so Giles spent most of the first dive getting familiar with the behaviour while I shot on my D100. When we returned a week later, Giles knew exactly what to expect and was able to show me the cracking shot of the barred hamlets in a spawning embrace that you see here, before I had even seen one pair spawn!

Rather like fish photography, capturing "the moment" of behaviour takes patience and careful observation. The shutter delay of the camera makes the whole process even harder and makes being familiar with the sequence of natural events is essential to getting the shot. But I think that the image Giles produced of the hamlets shows what can be achieved.



The key to getting split-second behaviour shots, such as these barred hamlets mating, is to observe the activity, without taking photos, until you can predict what is going to happen and be ready for the shot. Olympus C220. 5mm lens. 1/100th @ f13. Automatic (GS).

You can not know your camera too well. Giles knew that the Olympus could take half frame shots and used this feature to produce a split level image in the camera. Olympus C220. 5mm lens. 1/80th @ f8. Flash off (GS).

Split levels

On the second Friday morning we decided to snorkel at the Wreck of the Pallas to make use of the shallow water to take some colourful available light wide angle. The Pallas is a cracking snorkel, where you walk up the beach and then drift down through the waist deep lagoon through coral gardens and wreckage with the mild current. About half an hour into the snorkel, Giles stuck his head out of the water and told me he could do a split level with the Olympus. I knew he was talking rubbish. Split levels are just one of those shots that require specific technology - a large dome port and a wide angle lens. The Olympus had neither. But Giles had other ideas, and having studied the instructions he illustrated probably the most important lesson of using any camera: to really get to know the technology. The Olympus has a curious feature that they call "2 IN 1" that allows you to combine two half frame images, taken successively, in one frame. With careful use of this feature Giles created the split level shot of the Pallas, that you see here, in camera. If we had allowed ourselves to make more use of Photoshop, it would be the work of moments to hide the line between the two halves of the frame. One advantage of this technique is that because you take the two half of the frame separately you can easily solve the problems of the different exposures and focus required for above and below the surface and also the magnification effect of the water. A victory for imagination and application over technology!

Conclusion

Technology has always dominated underwater photography, and probably always will. It is no coincidence that the pathfinders of British underwater photography contained a large proportion of engineers who build their own technology before it was commercially available. And I'm sure that the same was true around the world. Few would argue that for certain shots you need certain equipment. But both of us were amazed by the range of images we could produce in just a couple of days with the little Oly. I am not going trade in my DSLR, or anything, but never before has the most basic technology available for underwater photography been so capable. Now is a great time to be starting underwater photography.

Alexander Mustard
and
Giles Saxted

The authors (Giles left and Alex right) enjoy a bit of après SCUBA. Note how we again used the night-time flash mode to capture the background lights of the disco!!

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Correcting lenses for underwater use

By Peter Scoones and Peter Rowlands

One of the main advantages of using a land camera in an underwater housing is the wide choice of lenses you can use but this advantage can become a problem as the lenses are designed for use on land rather than underwater. One solution is a dome port which helps to eliminate most of the optical problems but the dome must be considered as one element of a two element lens system in order to get the full focusing range of your lens.

This is something most housing manufacturers do not emphasise enough and it can lead to an underwater photographer not getting the best performance from the lens/port combination.

Assuming that we want to get the best quality underwater photographs it is neccessary to keep the water in between you and the subject to a minimum. It is the water which produces colour loss, definition reduction and overall clarity/contrast loss in our photographs so by keeping it to a minimum we can maximise the quality of the resulting underwater image.

Wide angle lenses

The most effective way to keep the water distance to a minimum is to use a wide angle lens but if they are used behind a flat port there are

certain optical problems which affect the quality of the image. These are caused by refraction at the air water interface because water is denser than air. For simplicity purposes we assume that the thickness of the port is small relative to the lens/subject distance so the refractive effect of the port material (glass, plexiglasss, perspex) is ignored.

Flat ports

When using a lens behind a flat port there are a number of disadvantages. The first is a reduction in lens angle. There is an effective reduction in angle of approximately 1/3rd making a 28mm become a 35mm, 20mm become a 24mm and so on.

The second problem is a loss of edge definition. This is known as 'chromatic abberation' (most severe at the edges) caused by distortion to the red and blue images which give the appearance of colour fringes and overall image softness towards the edge of the frame (not to be confused with 'out of focus').

The third problem is the loss of geometric quality. Pincushion distortion will render straight lines as curved. This is not neccessarily a major problem as there are very few straight lines underwater.

The fourth problem is a reduction in focusing range resulting in the lens not being able to focus as close as it would on land. This may not be a major problem with wider angle lenses which have a greater depth of field but it is best to retain the full land performance of your lens underwater.

Dome ports

A simple way of compensating for the effects of a flat port are to use a hemispherical dome as the port. If correctly set up, a dome system can greatly improve the photographic performance.

A dome port can restore lens angle, minimise chromatic abberation and restore (and even improve) focus

range and depth of field, as well as correcting pincushion distortion.

Since the dome, when used in contact with water, becomes a negative power lens, the camera lens will not perform the same as on land and a positive supplementary lens is needed to compensate for the negative effect of the dome.

Supplementary lenses

The power of this supplementary lens will depend on the curvature of the dome and, to a lesser extent, it's position in relation to the land lens.

The dome correction port is unfortunately not perfect and there are two main defects.

The first is curvature of field. This has the effect of rendering the subject in the centre of the picture being in focus while those at the edge are out of focus. This is most severe with wide angle lenses behind small diameter domes and it may be so severe that the edges can not be brought into focus, whatever aperture is used.

Using a positive supplementary lens of the correct power attached to the front of the land lens will reduce this defect but will not entirely flatten the curvature of field. Using a small aperture will reduce the out of focus effect of curvature by increasing depth of field.

Reflections

The second defect is one of reflections. Internal reflections on the inside of the dome often take the form of an inverted image of the surface or bright object (eg the sun) outside the picture area. Great care should be taken to provide an efficient lenshood and masking the unused parts of the dome surface will help. Reflecting surfaces inside the dome should also be blacked out i.e. lens markings and any chromed camera/lens parts.

For optimum results the dome/supplementary lens/camera lens positioning is important. The housing design may limit this possibility but let's look at the combination in a perfect world.

Assuming that the wall thickness of the dome is substantially the same over its entire surface, the internal diameter of the dome needs to be determined. From that information the power of the positive supplementary lens can be calculated.

The formula is as follows: f = 2d or 4r where f=focal length of the dome, d=diameter and r=radius. So for a dome with a 20cm diameter, it's focal length will be 2x20=f40cm (or 400mm) and it will have a negative power. To compensate for that negative power a positive supplementary lens of f40cm is needed.

hese supplementary (close up) lenses are often expressed in diopters. To find the power in diopters, divide the focal .ength in cms into 100. i.e a lens f40cms will be 100/40=2.5 dioptres.

Fortunately most quality housing manufacturers let you know what strength of dioptre is needed for their domes and all you have to do is purchase this and screw it onto the front of your land lens.

Lens positioning

The water/dome/supplementary lens will be a-focal (at optimum) when the supplementary lens is positioned at the centre of curvature of the dome (in strict theory this is not absolutely correct but is accurate enough in practice). It is important that the optical axis of the dome and the supplementary are accurately lined up and ideally should be fixed with the camera's lens located as close as possible to the supplementary.

In practice, when wide angle lenses are used with small focus travel the supplentary lens can be fitted to the filter threads of the camera lens and in this case it should be arranged so that the supplementary lens is in the correct position in relation to the dome when the lens is set at infinity.

In order to retain the full focusing range of your lens underwater, the lens must be able to focus on the virtual image of infinity when the land lens is set to infinity (this is an important point which most manufacturers don't point out). The optical effect of a dome underwater is to move the image of infinity to a virtual position 4x the radius of the dome from the supplementary dioptre lens. In practice this is much closer than infinity would be on land so a dioptre lens needs to be fitted to the front of the camera lens to counteract for the power of the dome.Some manufacturers say that as long as your lens can focus on the virtual image of infinity (i.e. with the land lens focused at minimum focus or thereabouts) then all will be well. Strictly speaking this is not true. It means you will be able to focus on infinity underwater but how much closer you can focus will depend on the close focusing capabilities of your lens. Check this out with the manufacturer/ supplier to make sure.

As we have seen with fixed focal length lenses behind domes, the dioptre/dome positioning must remain fixed in relation to eachother and as long as the zoom lens being used is not the 'push pull' design (which would move back and forward too much), then a zoom lens can be used behind a dome port.

Reality

All of the above is theoretically fact but in reality it may not always be possible to obtain theoretical perfection. For example, the dome you are using may not be a perfect hemisphere or the lens position in relation to the dome may not be correct.

In these cases the following alterations will take place.

If the dome section is not a full hemisphere with the lens being too far into the hemisphere of the dome (because to provide a full hemisphere would not be practical within the housing design) the resulting position of the lens will reduce its angle of coverage and you will need a slightly stronger dioptre lens to focus on virtual infinity.

This is a typical situation with most modern manufacturers as they try to produce more and more compact designs and only use a smaller section of the dome rather than the full hemisphere. However these manufacturers usually provide a full hemisphere dome which corrects the limitation at a greater cost in terms of both size and finance.

If the dome is hemispherical but the land lens is set back from the centre this will result in an increase in angle and introduction of poorer geometric correction as well the need for a slightly less powerful dioptre lens. However, this situation is unlikely to occur in most housings designs.

So there you have it! For some reason the theories of domes have never been fully described so we hope this has helped.

If, after you read this, you become paranoid about dome curvature/lens position relationships, don't get too concerned as the practical limitations of housing design will almost invariably result in some form of compromise between perfect positioning and the practical size of the end product and lastly, a slightly wrong dome curvature/lens position is nearly always far more acceptable than a flat port!

Peter Scoones

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Peter has been designing, building and using housings for over 45 years in both the amateur and commercial world. He has worked as a BBC cameraman for over 20 years on series such as ReefWatch, SeaTrek and more recently The Blue Planet. He has developed new cameras such as the "Polecam" to get new shots underwater and has just completed the production of two High definition video housings for the BBC which are being used to film their latest underwater series.

Peter Rowlands

peter@uwpmag.com

Peter Rowlands is Peter Rowlands

Back to basics
Digital SLR underwater
by Peter Rowlands

A move up from entry level to digital SLR photography is quite a leap in terms of finance, size and weight but it does allow you to take almost any photo you want underwater because it is a true system camera.
The arrival of the 10.5mm full frame fisheye and 12-24mm wide angle zoom helped restore the full lens range for underwater use.

Digital SLR (single lens reflex) cameras are now becoming much more popular as their prices fall, specifications increase and accessory lenses become available to make them perform like a traditional SLR film camera.

They offer several distinct advantages over the entry level digital cameras which were discussed in the last issue of UwP and now that housings are becoming readily available these digital SLR cameras (DSLR from now on to save my typing finger) are offering a real alternative to film cameras.

The main advantage is that there is no significant shutter delay. That means when you press the shutter you get the shot immediately. With entry level cameras the shutter delay can be at least a second although this can be reduced by half pressing the shutter release button to let the camera perform most of its function and, when you finally fully press, the shutter the delay is much reduced but is still evident.

The shutter delay was the main reason why I decided to 'invest' in a Nikon D100. Initially with my Olympus C40 entry level camera I was prepared to put up with the delay because I was learning about digital photography and I didn't take shots of fast moving subjects. As I became more familiar with the technology, the shots I wanted to take were being limited by the shutter delay so I went for the D100 but still kept the C40 as a backup.

The decision to upgrade is not cheap! There's the camera and housing as well as additional lenses needed to build a system to rival film cameras but the pivotal point for me was the introduction of the 10.5mm full frame fisheye lens. This, for the first time, gave the equivalent performance of the 16mm lens on 35mm film.

The reason Nikon produced this new lens is because the image sensor in a DSLR camera is smaller than the 24mm x 36mm size of a film frame. The main reason for the smaller chip size is economy. "Full frame" chip cameras have been around for some time but at a much higher price and I will not be discussing these cameras in this article because I am hoping to commission an article for the next issue on the reasons for going up to full frame.

The Nikon D100 and most other DSLR cameras retained their original lens mount so that existing lenses could be used but because the chip size was smaller the angle of coverage/focal length was reduced/ increased by a factor of 1.5. For sports photographers on land this was manna from heaven. It meant their 300mm telephoto suddenly became a 450mm with the added benefit of no increase in the maximum aperture. No wonder

The electronics in DSLR cameras are capable of adjusting colour balance over a greater range compared to entry level cameras. Add the ability to shoot and work fast in RAW format and you have total control of your underwater images.

D-TTL flash exposures are really only available with the Nikon land flashguns seen here with their Subal housing but I prefe to shoot manually with an Inon Z-220

they embraced the digital age so swiftly.

Underwater, however, is a different matter because, when photographing large objects such as wrecks we want to shoot with the widest angle lens possible to keep the amount of water between camera and subject to a minimum. The advent of the DSLR camera with a 1.5 increase in focal length effectively robbed us of a full frame fisheye because the traditional 16mm lens became a 24mm. As soon as I saw the 10.5mm lens it confirmed to me that Nikon were committed to the development of the DLSR as a true system camera. The 10.5mm came after the 12-24mm lens which was another new lens giving the equivalent of an 18-36mm on 35mm.

With these two lenses in place, my 60mm and 105mm macro lenses were still useable and one could argue had actually been made more useful because they became approximately 90mm and 150mm respectively.

The other advantage of a DSLR which should be obvious by now is that they can take interchangeable lenses so you can have the capability to shoot virtually any subject you want.

Another advantage of a DSLR camera over an entry level one should be the availability of TTL flash metering but here we get into some black magic country. For decades Nikonos compatible TTL flashguns have been the norm and have served us well on both Nikonos and housed camera systems. It therefore came as a bit of a shock to learn that the D100 was only TTL compatible with a new range of Nikon land flashguns and that the Nikonos flashes could not only not give TTL but may actually damage the electronics in the camera! The brainwashed among us accepted this move forward but then Fuji came out with a DSLR which worked in total harmony with Nikonos TTL flashguns so why couldn't Nikon have done that?!

As I explained in the Editorial in the last Issue of UwP I am actually happy to be back working with manual flash exposures but if you feel that TTL flash is an important feature then look very carefully at the specification of the camera you are considering.

With Compact flash memory cards available up to 4 gigabytes, this gives you around 400 RAW format images.

The final advantage of a DSLR is undoubtedly the processing power of the electronics. Most entry level cameras take time to process an image once the shutter has been pressed. The most common image file format is JPG which compresses the file by removing unneeded data without affecting the image quality significantly. This reduces the time taken to process a shot but your ability to manipulate the shot at a later date will be severely limited.

If you want to have total control over your image quality you will need to shoot and save your files in RAW format. This produces an image which is unprocessed and has had no data removed. Naturally these files are much bigger than a JPG so an entry level camera might take up to 20 seconds to store them. During this time you cannot take another picture. A DSLR camera has the electronic capacity to save these larger files and still let you take more shots. The number of extra shots you can take is not limitless unfortunately. The camera lets you take more shots because it is using its "buffer" memory to hold the files whilst they are being saved to the memory card. The D100 lets you take around four images in quick succession then you won't be able to take any more shots for approximately 20 seconds while the files are saved to disk. In my experience I have never "overrun" the buffer but I can imagine times when I would i.e. humpbacks and sharks where photo opportunities are limited to very brief swimpasts.

The ability to fire the motordrive on a 35mm SLR camera with no buffer problem is a major advantage in these situations but that is where the advantage definitely ends because you will only have 36 shots. With a DSLR you can have an almost limitless number of shots because you can simply buy a larger capacity memory card. I believe the maximum capacity of a Compactflash card is 4gig so if a 1 gig card will hold approximately 100 images, a 4 gig will give you up to 400 images! 35mm film users stick that in your pipe and smoke it.

The DSLR is not, however, perfect. Entry level cameras are much lighter, cheaper and less bulky and they have a nice large LED screen to view which shows the exact image you are about to get (shutter delay permitting). DSLRs on the otherhand are more expensive and bulkier and they have traditional flipping mirrors so you will only see the final image once you have pressed the shutter. In practice this is not a big deal as your image appears almost instantly on the LCD screen on the back of the camera.

For underwater use the DSLR optical viewfinders are not ideal. They are designed for use on land where you can get your eye very close to the viewfinder. Underwater with a mask makes the viewing image much smaller and makes manual focusing very tricky but the capability of the modern autofocus systems makes manual focusing, certainly for me, a thing of the past.

Whenever I 'invest' in a new camera system my partner Debbie always gives me a knowing look when I try to justify my purchase by saying "And this system is all I'll ever need". She's heard it too often (especially with computers!) but for once I really do believe that the DSLR format camera provides all I need now and for the future.

As a result, I will not be writing the next article because I'm not thinking of upgrading to a full size chipDSLR (FSCDSLR!). The problem is that I will have to proofread it and I might start to see limitations in my DSLR!

Time will tell.

Peter Rowlands
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Guidelines for contributors

The response to UwP has been nothing short of fantastic. We are looking for interesting, well illustrated articles about underwater photography. We are looking for work from existing names but would also like to discover some of the new talent out there and that could be you!

The type of articles we're looking for fall into five main categories:

Uw photo techniques - Balanced light, composition, etc

Locations - Photo friendly dive sites, countries or liveaboards

Subjects - Anything from whale sharks to nudibranchs in full detail

Equipment reviews - Detailed appraisals of the latest equipment

Personalities - Interviews/features about leading underwater photographers

If you have an idea for an article,
contact me first before putting pen to paper.
E mail peter@uwpmag.com

How to submit articles

To keep UwP simple and financially viable, we can only accept submissions by e mail and they need to be done in the following way:

1. The text should be saved as a TEXT file and attached to the e mail
2. Images must be attached to the e mail and they need to be 144dpi
Size - Maximum length 15cm i.e. horizontal pictures would be 15 cm wide and verticals would be 15cm.
File type - Save your image as a JPG file and set the compression to "Medium" quality. This should result in images no larger than about 120k which can be transmitted quickly. If we want larger sizes we will contact you.
3. Captions - **Each and every image MUST have full photographic details** including camera, housing, lens, lighting, film, aperture, shutter speed and exposure mode. These must also be copied and pasted into the body of the e mail.

Classifieds

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Underwater camera system for sale including F100 SUBAL housing, port for Nikkor AF60/2.8, Nikonos 105 Strobes, Nikon F100 camera body, Nikon AF60/ 2.8 micro lens, focusing lights, case, etc. Asking £1,700. Full documentation provided. One careful lady diver.

mcshearwood@ntu.edu.sg

FOR SALE

Underwater camera system for sale including F90 SUBAL housing, port for Nikkor AF105/2.8, Nikonos 104 & 105 Strobes, Nikon F90 camera body, Nikon AF105/2.8 micro lens, focusing lights, case, etc. Asking £1,500.

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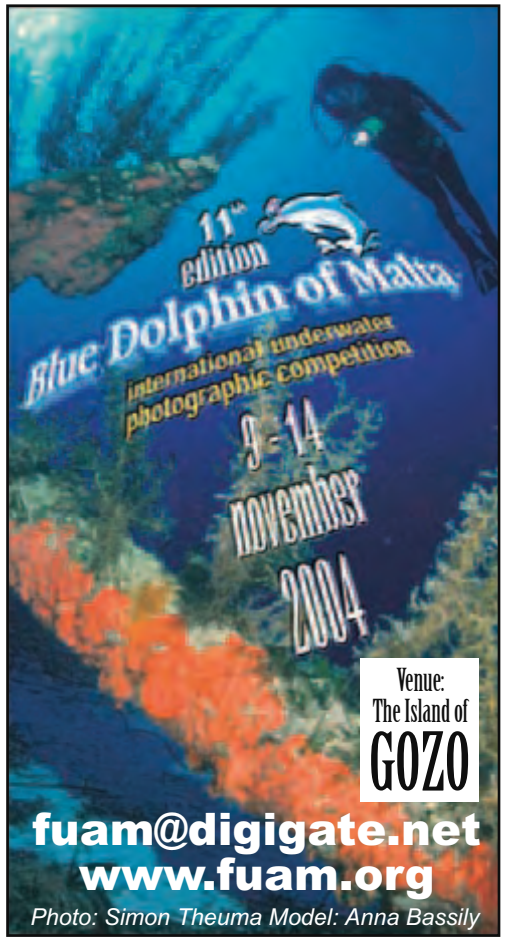

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Parting shot

Many, many years ago I was on a trip to Eilat in Israel in the days when film was film and shorediving was simple.

The week had gone well with no floods and some nice exposures confirmed by my trusty traveling E6 processing kit. It was the last dive of the trip and we didn't choose our site very well at all. It was quite a sandy, rubbly location with small patches of coral outcrops which didn't excite my photo imagination that much.

I was using a Nikonos V with a Sea and Sea 12mm full frame fisheye lens and Ektachrome 100 film. It was a lovely compact outfit.

The overall scenery was a muted sandy brown so rather than shoot horizontally and waste film I decided to put the camera under corals with the camera set to "A" aperture priority and the lens aperture at F16 for maximum depth of field.

There wasn't enough room for me to get my eye behind the viewfinder so I held the camera at arms length and used my thumb to press the shutter release. I lined up the camera as well as I could, took a shot and pulled the camera out from under the coral to wind the film on.

I only took one shot of this coral but repeated the technique under other pieces and eventually finished the film and therefore the dive.

Back in London I took the film to an E6 processor and was amazed, a couple of hours later, to see this shot jumping out at me from the lightbox.

When I leant forward with a Lupe to my eye I was amazed with the graphic simplicity, the lucky positioning of Snell's window and the final icing on the cake with the central starburst.

Now I know where "point and shoot" photography comes from!

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Do you have a nice shot with a short story behind it? If so e mail me and yours could be the next "Parting shot".