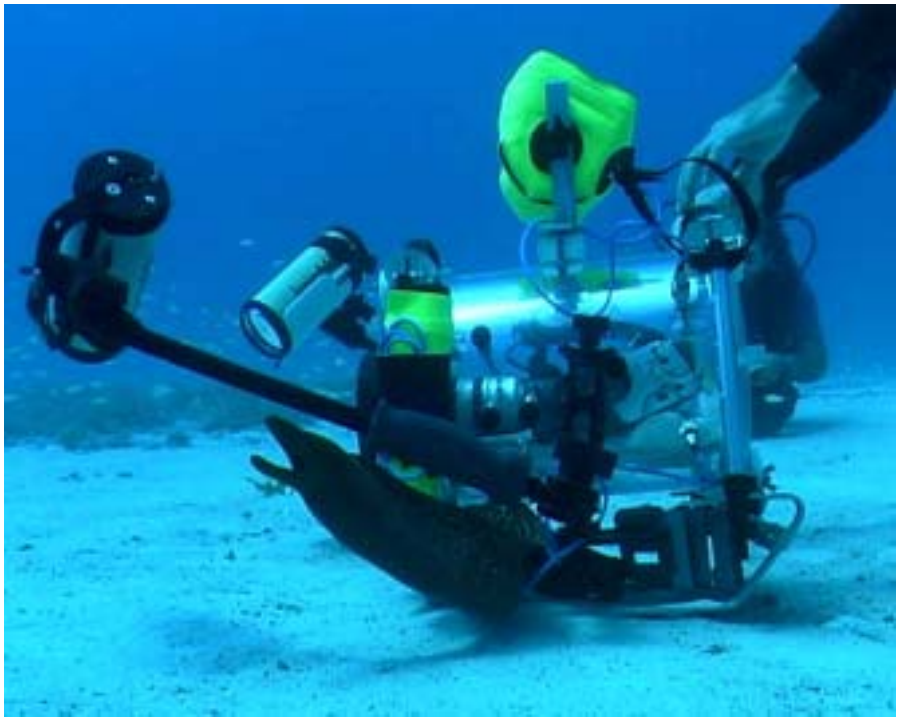
Cracking the egg

by Alan Graham

All images are still frames from digital video footage

Hard coral polyp (galaxea sp.) 6mm, egg release - depth 7m.



Undulate moray eel relaxes under camera housing at 25m depth.

It was 15 minutes after sun set. Descending cautiously into the blackened blue, eyes straining to accustom ourselves, we knew this window of opportunity would be fleeting. We had our full moon up and we had our Admiralty tide charts calculated correctly - so we thought. Now all we needed was for the corals to perform.

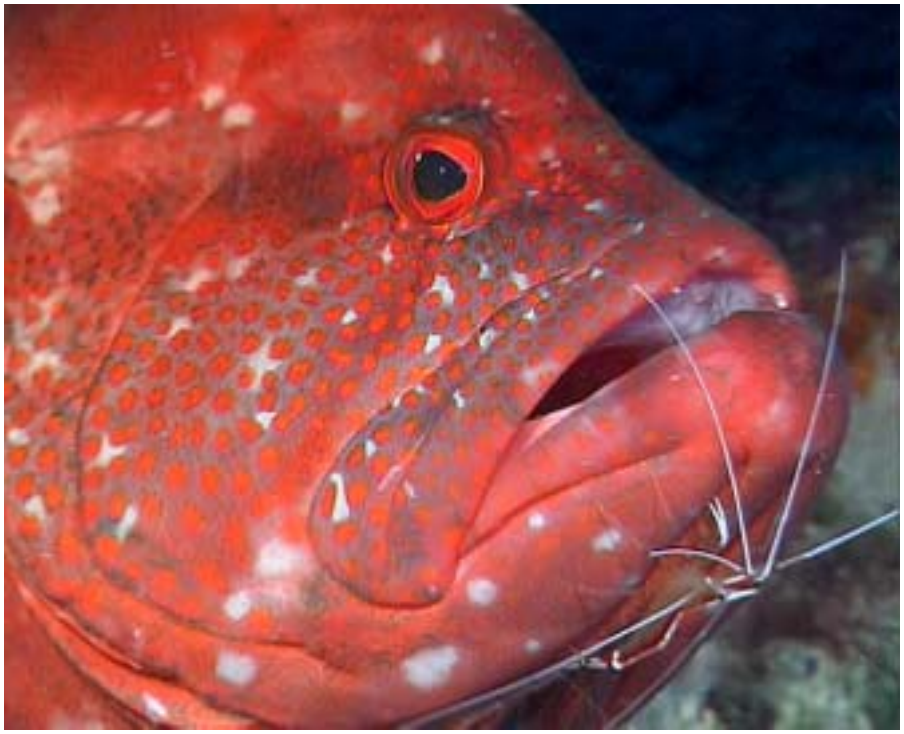
This was not the Great barrier reef, where mass spawning occurs on a given November night; here, off the coast of Mauritius, little if any scientific study had been done to assess when corals, sporadic or otherwise, might spawn.

It was February, minimal tidal exchange was at its peak in the year, essential for the coming together of sperm and egg during the night ahead, 'we figured'. Two camera crews and 3 scout rescue divers peered into the black, fans of light sliced through the water, all eyes desperately trying to focus on any small pale object that drifted by.

The call came within minutes. A grunt of excitement, like a fog horn in the night, sent our blood racing. It was one of the rescue divers who had made the first discovery. He was pointing ahead of him as if he'd seen a ghost, urgently stabbing at the water, yet we could see nothing. It was not until I got to within a few strokes that I saw the object of his excitement, just a few inches from his mask: a small pale egg, perhaps 3 millimetres in diameter - and then we saw another.

We were at a depth of 7 metres, above a reef slope about 100 metres seaward from the reef crest and on the cusp of a substantial drop off. So, we had found an egg, now we had to follow its course backwards, against the current, to find the colony from where it had been released. Our task became one of urgency. It only takes a few minutes for a coral colony to release its load. How many metres up current would we have to go before reaching our goal? I mean, pulling a camera housing the size of a dustbin is slow

Dolly at 5m stop, lights on extended top-mount arms, dome port for wide angle.



Cleaner shrimp (lysmata amboinensis) 4cm, on tomato grouper -depth 25m.

going. And if we reached the spot, would we have enough time to set up lights, stabilisers and camera shot, before the action was over?

Oh.., I think I forgot to mention. We were trying to catch all this action on video, in macro, to a magnification of about 5mm across the TV screen.

Why did we choose such an unlikely place to get the shots? Because the reef is just five minutes from our hotel room, for one thing... Budgets dictate!

Anyone who has dived off shore reefs knows that weather and transport are inherantly fickle beasts. When making a TV program of this nature will require over 150 dives, it makes financial sense to work from land, if you can.

Our company, AnD Creations, is a small independent production house, not a blond corporation with a topless budget. As such, we have many more gods than you might imagine. Besides, we had made the insane decision to go out and film a living coral reef in macro, rather than skip down to our local aquarium for the usual, banal shots in sterilised surroundings. Honestly, it did make sense back home in our living room!

Pick up any coral reef book and flick through the pages. What you see are remarkable close-ups of fascinating creatures, the habits of which have rarely been documented for television. Yes.., still photography was, and is, our mentor.

But just how were we going to compete? Where could we find help, when nothing like this had been done before? Moreover: how could we succeed at a reasonable cost?

Armed with only a storyline and an ambition, we set about solving the problems of underwater video in macro. Obvious horrors were lenses, stability and lighting; stability being the toughest challenge.

The Canon DV XL1 was our weapon of choice. Top in its class of 3CCD technology, it also met our specifications because it offered the possibility of interchangeable lenses. With a 60mm EF lens attached, our macro capability could achieve an amazing 400mm (the camera's chips being 1/7th the size of a 35mm tranny). An extender or two offered various depths of field: about 4mm at f16 with a minimum focal distance of about 15mm being a manageable standard for polyps.

Acceptable housings, for a camera which had only reached the European shelves in late 1999, were still unavailable, by our deadline of summer 2000. So, we decided to build our own.

Stanley Plastics manufactured acrylic tubes with external fixing plates and pressure sealed interchangeable ports to our specifications. Then we constructed rails, skids and telescopic legs from aluminium. Controls and cable plugs were supplied by Ikelite, with holes bored into the side of the housing using a pencil laser to line up the bit with the camera controls.

Five inch TFT monitors were stripped, then housed in separate acrylic compartments, secured to the top of the camera housing on a swivel mount which could be removed and hand-held as need be. This essential ingredient meant that we were no longer forced to place our head and body behind the camera to eye the tiny viewfinder while shooting. We could shoot vertically, from the top, pivot and track sideways, or even film at arms length while remaining comfortably in command.

Housing kits were fully adaptable, and needed to be. Shooting macro when the subject is less than a foot from your 6" port, requires that lights be managed on highly flexible arms. We chose Kowalski 50W lights (thanks Andrew at Ocean Optics), because they were small enough to squeeze in around the ports for close up work, while offering good, clean spread for wide angle shots.

Eight, 1k standard belt weights were placed beneath each camera housing on rails between the skids, before each dive. This neutralised buoyancy while allowing us to slide the weights to the front or rear of a housing during the dive to alter the pitch of the camera. Weighing in at around 25 kilos fully loaded, it took two guys to lower each overboard. But once wet, they remained perfectly stable in mid water, at what ever angle they were required to shoot.

For extra stability if working on the bottom, an extra couple of weights would sink the lot. The housings, being tubes, were more hydro-dynamic than flat sided

Dolly in mid water, shows weights beneath camera on rails - depth 8m.

Cleaner shrimp (lysmata amboinensis) 4cm, rock outcrop - depth 25m.

Pyjama nudibranch (chromodoris magnifica) 4cm, at night - depth 12m.

All images are still frames from digital video footage

housings, they gave less drag across a current. Four legs, one on each corner of the housing, could extend 1 metre telescopically, allowing us to level the camera securely on uneven surfaces, tilt precisely, or pivot on one leg for panning shots in close up. Each leg was tapered to a fine rubber point, for placement without damage to substrate, while skids were the ideal option for working in sand.

And one other thing: the cost of underwater mics is unreal! So we built those, too. We spilled the guts of a standard 1.5v condenser microphone into the empty carcass of a typical, 4 cell UW torch (flashlight), with a 5 metre lead for remote pick up. Quality and frequency response were assured, while maintenance was a breeze.

I suppose that is the most important factor when you are a

million miles from home: maintenance! Diving 3 times a day for 2 months puts the equipment through hell, and we had our share of hassles. Losing a few days due to equipment failure can be very costly in this business, but we never lost a single dive. Our systems were all designed by us: every knob and spring, wiring diagram and clamp was ours - even a lawn mower drive belt used for manual focus of EF lenses; we had built these babies so we could repair them, instantly.

We carried spares of everything. Three extended ports for various lenses, 2 flat and one 8 inch dome - interchangeable between housings. Four lenses, an extra monitor, and battery packs which could take standard AA or D cell batteries if our chargers or packs died in the night. We're not rocket scientists, but as one well known underwater photographer once confided in us: "underwater anything is a real hands on kind of job."

It was those words which probably gave us the confidence to tackle the seemingly impossible. We would not, however, suggest anyone try and build their own re-breathers!

So there we were, back peddling up current for all our might. The trail of eggs was slowly descending with every fin stroke we covered. The reef below was rising up to meet us, a sure sign we didn't have long to go. And yet, so insignificant was the activity, we might have passed the spawning colony altogether, had we not been looking for it. Dolly noticed it first, a release of perhaps 10 eggs in quick succession, a necklace of pearls dancing to our left, on the very edge of the drop off.

I was carrying the macro set up, so Dolly went in first with a standard flat port and zoom lens. We made it a rule, never to have the same set ups on a dive. The most agonising thing about wildlife photography, is being harassed by some cocky little creature you've never seen before that just knows you've got the wrong lens on.

I watched as Dolly and her assistant battled to place the camera legs, both their bodies as if clothes on a washing line, being swept sideways by the demon current while they worked. BCDs hurriedly evac'd, but still they floundered. Fingers clinging in ernest to the housing, fiddling with creaky knobs and pesky levers. Monitor cocked out and up, now..; lights extended on twisted arms, like luminescent anemones in the grip of some giant, boxing crab.

I could see that the galaxea colony was almost two thirds done, and Dolly was still struggling with focus. I manoeuvred around behind her to take a peek at her monitor, and was riveted by the sight. She had about 5 polyps on screen, and as each egg began to appear the polyps were exerting such pressure to release the enormous load that their soft tissue was literally expanded like a balloon.

With just 3 eggs left to be released, Dolly rose up and signalled me in. It was my turn to look foolish. The challenge: get a single polyp in full screen releasing its egg. With time to prepare my camera housing before approach I had less set up to do but I was breathless, my muscles trembled uncontrollably and my brain was in a mess. My worst fear was realised immediately, I couldn't get the damn polyp on screen - I couldn't find it.

I could see it if I peered around the housing, but it was like trying to thread a needle blindfolded - in a hurricane. I knew it was there.., somewhere. But where?

"Patience, Alan," I told myself. Then I told myself to shut the hell up! I looked over the housing and there was only one egg left. Desperately I fought the current and I fought the camera.., and then finally I had the polyp on screen. A few seconds later I had focus, and watched in awe as the egg slowly emerged. Within 10 seconds it was all over!

Alan Graham. Ring-necked parakeet on hat (IUCN cr. endangered)

One single egg of millions which spawned that night, GONE.., up on a remarkable journey of hope, of survival.., towards forever, and into the beyond.

We dived seven nights in a row during the wane of that February full moon. Five other species of coral were successfully filmed spawning, but nothing was more exciting, more exhilarating than that first time. If you'd been on shore around half past eight that night, having a leisurely moon-lit stroll along the beach, you might have thought some poor diver was being murdered for a heinous crime. A little dive boat 300 metres out to sea, was heaving and bucking, while screams of delight and cries of shear madness carried for hours and miles across the still ocean swell...

For all I know you might have heard us in Madagascar.

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