

IN THE BEGINNING...

Divers belonging to a Florida based organisation called the Wakulla Karst Plains Project (WKPP) hold most of the world's cave diving depth/distance records, including one awesome three kilometre penetration at an average depth of 87 meters.

Now you might think that the life support equipment needed to survive these record breaking exposures would be like something from NASA - big, complex and expensive. Wrong. The WKPP cave diving equipment system is made from inexpensive and readily available components. It is slick, light and streamlined - a model of efficiency and economy. And its applications reach far beyond the confines of extreme-range mixed-gas cave exploration - it is ideal for recreational cave and open water technical diving too.

AND THE WORD WAS HOGARTH

Conceived originally by Bill Hogarth Main and refined to a state of Zen-like simplicity over tens of thousands of dives, the Hogarth system is the embodiment of the 'less is more' philosophy. Every item in the Hogarth rig has been considered in relation to every other. The result is a minimalist approach in which a few carefully chosen components are integrated into a total life support system. Hogarth is clean, neat, safe and cheap.

To a Hogarthian diver anything less than optimal is unacceptable. By contrast, many divers prefer to mix'n'match equipment on an ad hoc basis. These more arbitrary configurations are usually described by the term Personal Preference and include helmets with torches clipped to them, back-up regulator long hose strapped to the tanks with bungy rubber, technical or jacket style BCs with or without redundant bladders, primary-light battery packs clipped across the bottom of the tanks (butt-mounted), and breathing from the short hose.

While Personal Preference may appeal to small 'I' liberals, it is an anathema to Hogarthian divers who consider it sloppy, ill-conceived and dangerous. They claim it creates more problems than it solves, and if there is a plan behind it, it is purely to maximise retail gear sales.

ON A WING AND A BACKPLATE

The Hogarth system is based on a backplate bolted to dual tanks and a single set of Dive-Rite wings. Only one set of wings is used. If redundant buoyancy is required it is provided by the drysuit (trilaminate membrane - not neoprene, I'll explain why shortly).

The backplate is worn with a single piece of webbing threaded through the plate to form shoulder loops and waist straps. The waist straps are fastened by a weight belt quick release buckle. A crotch strap is attached to the bottom of the backplate and runs forward between the legs to loop onto the waist straps at the front.

There are just three D-rings on the main webbing, one at each shoulder and one at the left hip. The D-rings are held in place with weight retainers threaded onto the webbing. A fourth small D-ring is attached to the crotch strap at the back. Unlike technical BCs, the Hogarth rig leaves the chest clear and clean. The webbing stays tight and close to the body. There are no projections to catch or dangling straps to snag.

No weight belt is worn. Instead, two manifolded steel tanks of 12 or more litres provide negative buoyancy even when empty. If more weight is needed, a heavy stainless steel backplate is used. If even more weight is required, a long lead weight (V-weight) is bolted to the backplate between the tanks. By eliminating the weight belt, the Hogarth system eliminates a source of danger from accidental release and line entanglement, inefficiency due to extra mass and drag, and discomfort.

For the same reason, neoprene drysuits are unacceptable. Weights must be carried to counteract the neoprene's inherent buoyancy near the surface. At depth the neoprene compresses (even pre-compressed or crushed neoprene holds compressible gas bubbles) and loses buoyancy, so the wings must be inflated to compensate for the weights. Inflated wings produce drag which requires extra energy to overcome. The extra energy increases gas consumption. Increased gas consumption limits the diver's range which, in turn, limits the effective range and safety of the whole team. This cascading series of problems is typical of Personal Preference equipment and configurations.

LET THERE (ALWAYS) BE GAS

An isolation manifold connects the tanks, enabling a faulty regulator to be isolated while still

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giving access to the gas in both tanks. A first stage is attached to each valve.

The first stage behind the right shoulder feeds:

- a) a second stage on a 7 foot hose
- b) the wing inflator hose.

The first stage behind the left shoulder feeds

- a) a second stage on a normal length hose
- b) a drysuit inflator hose
- c) a contents gauge.

That's it - the exact Hogarth rig in which (with only the addition of an argon drysuit inflation bottle and a pee valve) two WKPP divers set the world cave-diving penetration record of 4.3 kilometres.

WHERE EVERYTHING GOES

The cylindrical cave light battery canister has a belt loop on it which slides on to the right waist strap. The canister is worn as far back as it will go, right up against the backplate, where it is in the lee of the shoulder and so creates no drag.

The waist straps are fastened with a weight belt buckle fixed to the extra long strap on the left side. The webbing is arranged so that when the right waist strap is threaded through the buckle and pulled tight, the buckle sits all the way round at the right side of the body, tight against the light canister. Thus, the buckle not only secures the waist straps, it holds the canister in place against the backplate.

The free end of the right waist strap should be long enough to reach round to the centre front where it is held in place by the loop at the end of the crotch strap.

Stage and/or decompression bottles are clipped off between the D-rings at left hip and left shoulder. Contents gauge is clipped off to the left hip D-ring. Reel (and if wreck diving, folded lift

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bag) is clipped off on the crotch strap D-ring at the back. Other stuff - jump reels, line cutter, tables, car keys, paperback book, deco toys, jelly snakes, waterproof game-boy, etc., - fits into a flapped pocket sewn and glued to the front thigh of the drysuit.

The second stage on the short hose is your back-up regulator. It comes over your right shoulder and is held close beneath your chin by a surgical rubber loop which goes round your neck.

The second stage on the long hose is your primary. This is the one you breath from throughout the dive and donate in an emergency. The hose goes down the side of the right tank behind the wing to waist level, then it turns forward, passes between your body and the bottom of the light canister, comes diagonally up across your chest, over your left shoulder, around the back of your neck and the reg goes into your mouth. A clip on the hose next to the regulator allows you to 'park' it on the right shoulder D-ring when not in use. When gearing up, the long hose is the last thing you position, so it ends up on top of everything else.

WHAT DOES IT ALL MEAN?

All Hogarthian dive team members know where their partner's gear is in a black-out or a silt-out. There is no reg-swapping during the dive (as is necessary with independent doubles). The long-hose primary remains in the mouth until a team-member needs it in an emergency. You hand it off to the out-of-air diver, duck your head to release the hose, and immediately he/she has 4 - 5 ft of hose. You then reach down and flick the hose from beneath the light canister and she/he now has the whole 7 ft.

The reason the out-of-air diver gets the reg from your mouth is because a) you both know it works - you were just breathing from it, and b) in a silt out, he/she may not be able to locate your secondary regulator by touch, but she/he can always find your head by touch, and thus, find the primary reg in your mouth. See? Everything has a reason.

The reason for the long hose is that when two divers wearing doubles are sharing gas in passageway, a short hose makes progress out of there next to impossible.

Your back-up regulator is always tight up under your chin, You can find it and lift it into your mouth instantly. Some people can actually duck their heads and grab it with their mouth,

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hands-free.

NOT JUST WHAT BUT HOW

1. Strict team diving - your buddy is part of the Hogarth system
2. Strict gas management rules (thirds or better)
3. One depth gauge and one timer per diver (Uwatec digital depth gauge and bottom timer is good) - your partner's gauges are your back-ups.

THE ART OF BREATHING

To improve reliability and performance it is common to put first stages from one manufacturer with second stages from another. In the US Poseidon Odin and Scubapro MK20 first stages with Scubapro G250 or Apeks/Zeagle/Beuchat VX-10 second stages are used for bottom gas. In Europe the MK20/G250 combination is favoured, along with Apeks T50D firsts and seconds. In Australia, Sea Hornet Command Air firsts and seconds predominate.

Stage bottle second stages needn't be high-performance. But they should be reliable, dry breathers and, most importantly, not free flow. Balanced piston first stages are usually used with lower performance second stages. On deco cylinders you'll appreciate easy-breathing regulators, especially on long hangs. High flow rates aren't necessary because these regs are used shallow and at low work-rates. In the US, piston first stages like the Scubapro MK20 or MK10+ are used with G250 second stages. In Europe the MK20/G250 combination and the Apex T50D first and second are favoured. In Australia we tend towards Command Air firsts with Oceanic Alpha seconds.

All second stages should allow you to unscrew the cover underwater, pull out the diaphragm, swish them around to clean any muck out of them, loosen a sticking mechanism, then put them back together. Again, there's a reason for everything.

LOOK MA, NO COMPUTER

Dive computers are not used for mixed gas diving in the Hogarthian system. Instead, software like Decom (imperial) or ANDI Dive Planner (metric), based on proven Buehlmann algorithms, is used to plan your dives beforehand. You then prepare tables and contingencies for the depth you're diving and the gas you're carrying. The tables are written out or printed and laminated.

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Two copies are carried. Using this software makes you think through your dives beforehand. You can model alternative profiles and gas mixes. And you begin to see patterns emerge. After a while, you get to know the sort of deco shapes and times to expect for different dives.

Many Hogarthian divers modify their tables over a series of dives to incorporate new findings in hyperbaric medicine and bubble mechanics. The modifications generally include the addition of deep stops.

Obviously, no one person can think of everything, so Hogarthian divers tend to distil the wisdom of many and only choose the best, the proven and the most justifiable - which is why the Hogarthian system seems fairly well standardised. For those people who have any "what abouts..." as in "what about my 'bondage wings/technical BC?..." "what about my aluminium tanks?..." or "what about my neoprene drysuit?..." you should remember that the people who put together the Hogarthian system have had the opportunity to try almost every piece of diving equipment in existence. They have dived it and either integrated it into the Hogarthian system or rejected it as deficient. There is Hogarth and then there is Second Best.

AND THE LAST SHALL BE FIRST

Finally, the First Rule of Hogarthian diving is possibly the most important piece of wisdom in the diving world, and is something we should all apply to all of our diving. It is, simply, 'Don't dive with strokes.'

The term 'stroke' refers to someone who, knowing there is a better system, chooses to dive in a less than optimal way. It applies to those instructors who encourage students (who know no better) to exercise Personal Preference, in order to sell more equipment; it applies to those who don't plan their dives; those who dive beyond their abilities; who dive deep on air; who take unnecessary risks; who do big dives using unfamiliar gear; who's only reason for diving is depth.

Diving with strokes moves us into an area where our safety is no longer in our own hands. Strokes are sometimes highly 'qualified'. Often they seem very confident - usually because they have no concept of the danger they are getting themselves, and you, into. Strokes appeal to your sense of adventure while pretending to adhere to some standard of common sense. In groups, strokes are capable of exerting extreme peer pressure. And in case you believe you are

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immune to strokism, just remember that two of the leading diving explorers of our times, Rob Palmer and Rob Parker, recently succumbed to peer pressure and died on deep-air dives. So whatever else you do, remember the penultimate rule of Hogarthian diving and apply it with no exceptions: Don't dive with strokes. They're out there. And they will kill you.

Billy Williams