

Leigh Cunningham

Divetables, Computers or Bottom timer?



Leigh Cunningham is the technical manager and TDI Instructor Trainer for Ocean College, Sharm El Sheikh.

Probably best known for his records - Leigh once held the record for the deepest dive in the Red Sea - and attempts of reaching extreme depths, he also has a wide range of teaching credentials to his curriculum:

TDI instructor trainer, DSAT Tech Trimix instructor, PADI MSDT IANTD Technical diver instructor CMAS 3 star instructor.

During our initial open water training, we were all shown how to use a dive table. But did we ever use it again - and is the right tool?

Doing the table exercises during our first open water course, we could establish an NDL (No Deco Limit) and pressure group, find a repetitive pressure group based on our surface interval, and see how long we could safely spend on our second or next dive, without exceeding the NDL, and what not.

Few instructors, however, remember to mention at this point that dive computers or bottom timers can do all this, easier faster and safer. And in reality, on the next adventure into the abyss, most will be indeed be equipped with a computer and/or be supervised and led by a dive master anyway.

So what are the chances that we will actually look at any tables again?

The dive table

Looking back into my own experiences, I remember shortly after completing my own first diving course, CMAS one-star in Eilat, Israel, unfortunately with three different

instructors, that spoke English as well as I speak Hebrew, I started working as a chef on a liveaboard dive safari boat. Unfortunately, there wasn't so much in the way of dive leadership on this boat either, but it was a long time ago, and that's another story.

So, after trying to plan initial dives with my nice new shiny table, I came to the realisation that I didn't speak Hebrew, and this table wasn't much use for planning the multi-level profiles, which the other recreational divers on the boat were planning.

I therefore soon put the dive table to the bottom of my dive bag and started following other divers around wondering if I'd got the whole story wrong regarding decompression, Nitrogen loading and DCS.

After my initiation, with some diving experience and knowledge gained, it was clear to me that square profile diving—in which you go straight down, swim horizontally and then go straight up, (the only way to accurately measure nitrogen loading with a set table)—in this environment was about as rare as a polar bear in the Sinai.

And for good reason—most of the corals and marine life were located in the first 20 meters.

The dive wheel

A number of years later, I was introduced to the PADI wheel (a method of planning multilevel dives with a set table, see illustration next page)—*fantastic*. Later still, I had the pleasure of instructing students in the use of the wheel. After a short while, I noticed numbers fading on this high tech device due, I think, due to the combination of sun and sand that seemed to get in everywhere.

Particularly for new divers who are diving in warmer water reef environments and following the dive master or leader around, it is a good idea not to exceed the planned depth, ascend to a decreasing depth level and when you reach 100 bar cylinder pressure, head to your five meter safety stop with around 60 bars left.

No more talk of pressure groups, and you didn't seem to get bent. But let's get on to the next rung on the ladder of technical evolution and get digital

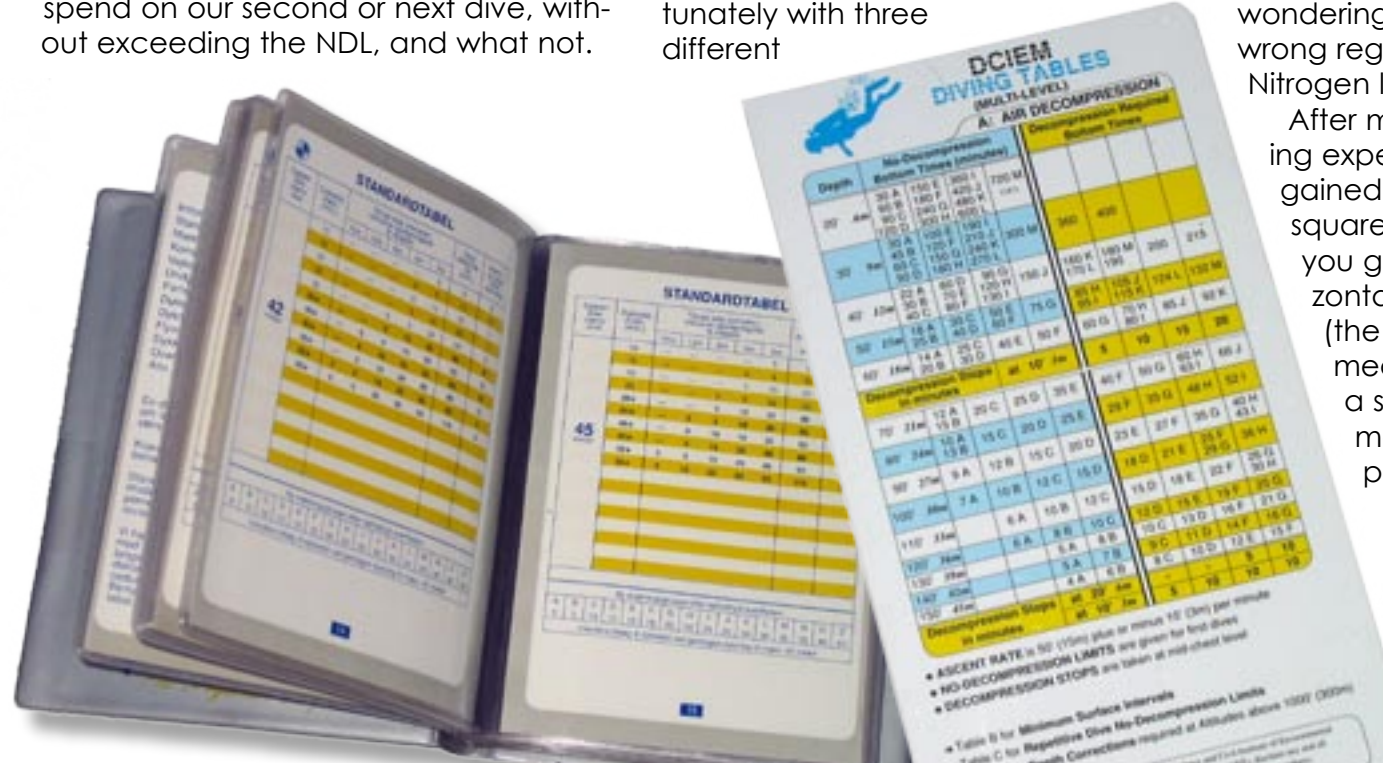
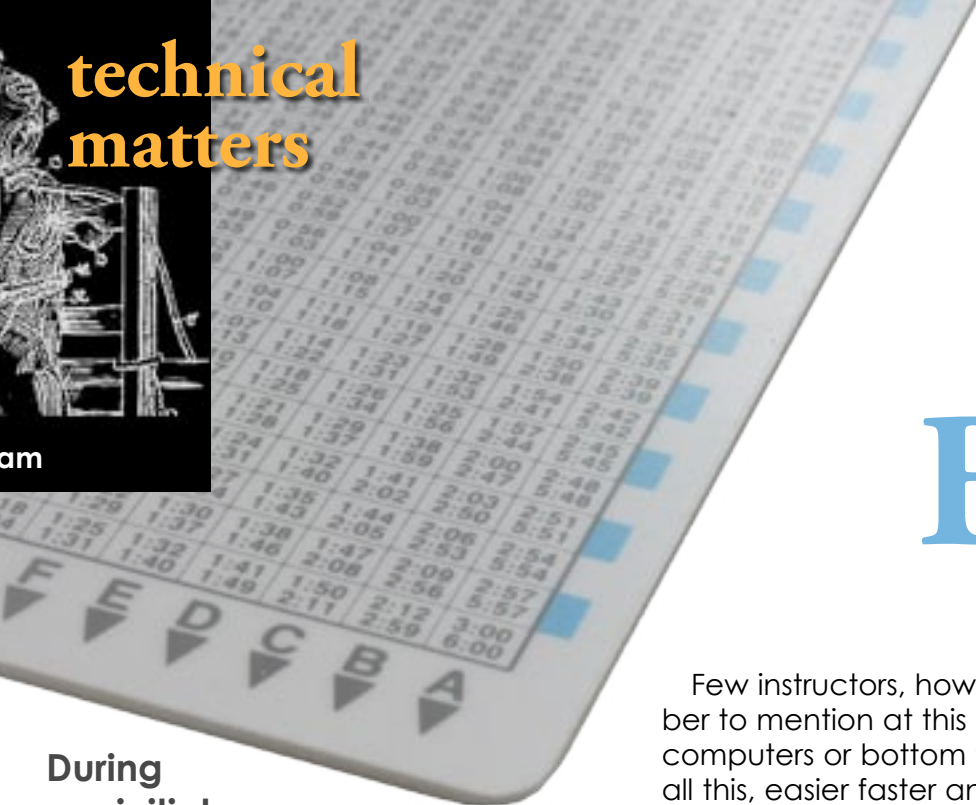
The dive computer

Let's begin with a word of caution: The only way to really gauge nitrogen absorption and elimination, establish an accurate NDL and predict resid-

ual nitrogen levels, which needs to be taken into consideration on repetitive dives, is to wear, or have somewhere on your person, a *dive computer*. It's better to be safe than sorry and have an annoying itch and a blotchy red rash.

If you don't have a dive computer and this sounds like your type of profile or dive plan, or for anyone whose actual dives do not accurately simulate the pre-planned, depth and time plan—GET A DIVE COMPUTER.

Buy one before your next dive trip. ▶





But do consider an appropriate computer—which is one for your experience level and the type of diving you will be doing in the near future. The most expensive computer in the dive shop may not be your best choice. I would recommend a “single mix”, that is a basic nitrox computer to begin with. With recent advances in technology, all but the most basic dive computers will have an FO₂ (Fraction of Oxygen in breathing gas, usually set as %) selection option.

This also enables divers to track both Nitrogen and Oxygen parameters (such as CNS toxicity, time and partial pressure limits) accurately, in blends from 21% Oxygen (regular air) through to EANx 50 (Nitrox with 50% Oxygen), based on the exact mix the diver is breathing.

Shortly after entry level training, more and more divers are making the wise choice to enroll in a basic nitrox course, making the optional FO₂ selection computer the best buy.

The bottom timer is an electronic depth gauge with a few basic functions. It doesn't do any computations as regards to decompression or limits

The reality of diving in the 21st century

So, even if divers may need a table to eat their lunch from between dives, the dive computer still wins on all other points over the dive table.

The theory behind Nitrogen absorption, elimination and bubble formation can be gained without the necessity for dive table explanations and use during the entry level course.

Entry level diving courses with some training agencies include dive computer explanations and use instead of the dive table which is now optional reading. In the future, all training agencies will consider set tables to be optional and eventually deem them obsolete.

Technical diving

For the technical diving community, tables have been obsolete for many years—although some tech divers will keep them in the dive bag as they are useful for drawing straight lines on the dive slate.

The tech diver is, however, consumed by the world of somewhat nerdishly interesting decompression software packages, dive computers and bottom timers.

Discussing V-plan over Z-plan, Gue over Gap, Pyle, WKPP, modified stops by changing gradient factors, Nitelk Helium vs VR3 computer and what

not. All these become end-for debate. The general interest is, in the last few years, we have seen the birth of the mixed gas computer—one small step for computer manufacturer's, one big step for mankind.

Everybody's a winner

Aside for the faithful bottom timer, which has been cruelly rejected by divers, the blessing has been the mixed gas computer.

No longer will mixed gas divers need to carry wet tables with an array of back up plans or back up slates.

No longer will mixed gas divers need to spend hours generating numerous bail out plans taking into consideration exceeding planned depth or time, loss of gas scenarios and appropriate checks along the way.

No longer will mixed gas divers need to travel into the unknown hostile abyss without the added security of having a computer on their wrist that is tracking gas absorption and elimination based on a mathematical formula or algorithm that simulates the rate at which our body tissues absorb and eliminate He and/or N₂.

With up to 10-mix pre-programmable gas switch options and whatever ratio of He to N₂ you so desire, the mixed gas computer is the true Ferrari of

topics have less subjects part of in all this years, birth of the computer— digression from the primary plan, whether the digression was depth or time based, or due to loss of a particular gas ie because of equipment malfunction. With this in mind, the dive can now be treated the same as an air/EANx decompression dive with the diver using two multi mix air/EANx computers.

Dive tables and the dive computer offers a simulation only. Diving an accurate plan is no absolute guarantee DCI will not occur

dive computers. Divers now have a re-adjusted plan based on the exact digression from the primary plan, whether the digression was depth or time based, or due to loss of a particular gas ie because of equipment malfunction. With this in mind, the dive can now be treated the same as an air/EANx decompression dive with the diver using two multi mix air/EANx computers.

Another word of caution:

Don't slip into the habit of making a plan on the fly—deciding upon exact depth and time during the dive. The mixed gas computer could encourage this bad habit. Trimix diving must be shown the same degree of respect. Dives must be executed with the same high degree of accuracy and maturity as they always have been.

The Bottom timer

So where does this leave the bottom timer? A paper weight—much more useful than the dive table. No!!!

The bottom timer will always deserve its rightful place as a very good back up depth/timer for the recreational or technical diver and for the new mixed gas divers whose budgets

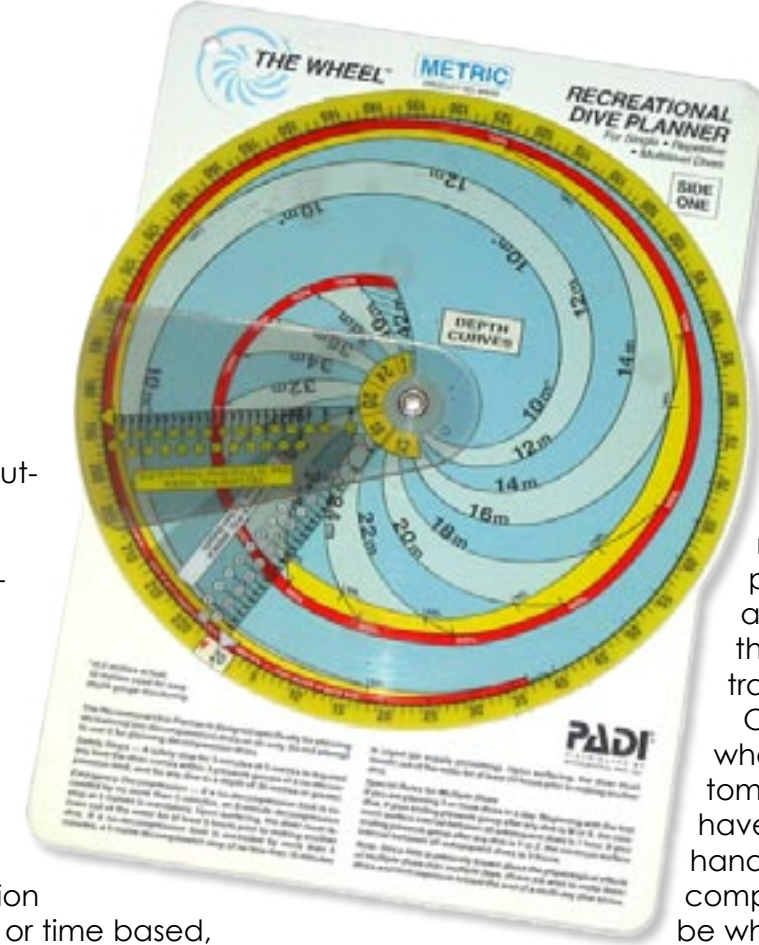
might not stretch to two-mix gas computers directly after paying for the formal Trimix training. One minor area where a bottom timer may still have the upper hand over the dive computer could be when divers are pushing the depth envelope. The diver may not agree with the specifics regarding modifications to the algorithm that a type of computer incorporates, which dictate the type of schedules generated by the computer. Or, the computer may simply not have the required range. A depth timer or the computer in gauge mode may have greater range than the dive computer itself or the computer in computer mode.

Conclusion

In my opinion set dive tables are a thing of the past. The appropriate computer for you and your type of diving has to be the way to go. The bottom timer has got it hard, but still a very useful tool.

One last thing: Dive tables and the dive computer, if used correctly, simulate the rate at which our body tissues absorb and eliminate nitrogen based on a number of theoretical tissue compartments. Diving an accurate plan is not an absolute guarantee decompression illness will not occur.

P.S. Keep fit and drink lots of water. ■



Have you ever thought of this: The Wheel is actually an analogue computer