



Bailout CCR course standards outlined

Rebreathers are great pieces of kit that do away with the need to carry an excessive amount of dive cylinders on deeper dives. However, this advantage is offset by the need to also carry additional open circuit cylinders on which a diver can bail out in case of a rebreather malfunction. Using another rebreather could be a better solution and to that end, a bailout rebreather course has been developed.

So why can't you just strap on another rebreather and switch to it if need be? It is not quite as simple.

Rebreathers are quite bulky pieces of equipment so two rebreathers take up a lot of space. They also demand a lot of a diver's attention, providing a degree of task loading.

Various dual rebreather designs have provided different takes on a solution but many of these

constructs comprise a double set of scrubbers, controllers and some other core components packed fitted inside one unit but still sharing the same loop. Obviously, such designs don't offer any protection against catastrophic flooding of the loop.

Enter sidemount rebreathers which, being compact, are both easier to attach and to carry, and some are complete units on their own.

Procedure is different

Then there is the matter of how to bail out to another rebreather. Unlike bailing out on open circuit which requires little more than a simple swap of mouthpieces while closing a valve or flipping a lever, there is more to it when it comes to closed circuits and a different set of issues to tend to. For example, when bailing out to an open circuit the diver can immediately breathe from the regulator but when switching to a secondary rebreather it is also of paramount importance to ensure that the pressure of the breathing loop equals that of the ambient pressure. If the pressures are unequal the diver won't be able to breathe.

A relative vacuum in the loop will result in collapsed counterlung, squeezed hoses and possibly ingress of water. Any attempt to breathe from a device in this

<https://xray-mag.com/content/outlined>

[bailout-ccr-course-standards-](#)

state could result in instantly sucking the gas out of the diver's lung resulting in drowning. The inverse problem where the loop is over-pressurised could cause lung or stomach barotrauma.

The correct procedure is therefore to switch to open circuit first, either through a BOV or a second stage regulator, while testing and preparing the loop on the bailout rebreather and only move onto it once it has been ascertained that the loop has the same pressure and the gas is breathable.

Course standards

This is but one example among several salient points the developers of the first standards for a Bailout rebreather Diving Course are addressing in their course. Matthew Jevon, who our readers will recognise as a regular con-

of their existing CCR qualification on both the unit planned to be the primary rebreather and the unit to be utilised as a bailout/back-up rebreather."

Needless to say, this isn't a course for newcomers but primarily aimed at advanced mixed gas rebreather divers. Enrolling in the course requires a minimum of 100 hours logged on both units, a minimum of 50 dives on each unit being used as the primary rebreather and that at least 20 dives on each should be mixed gas dives.

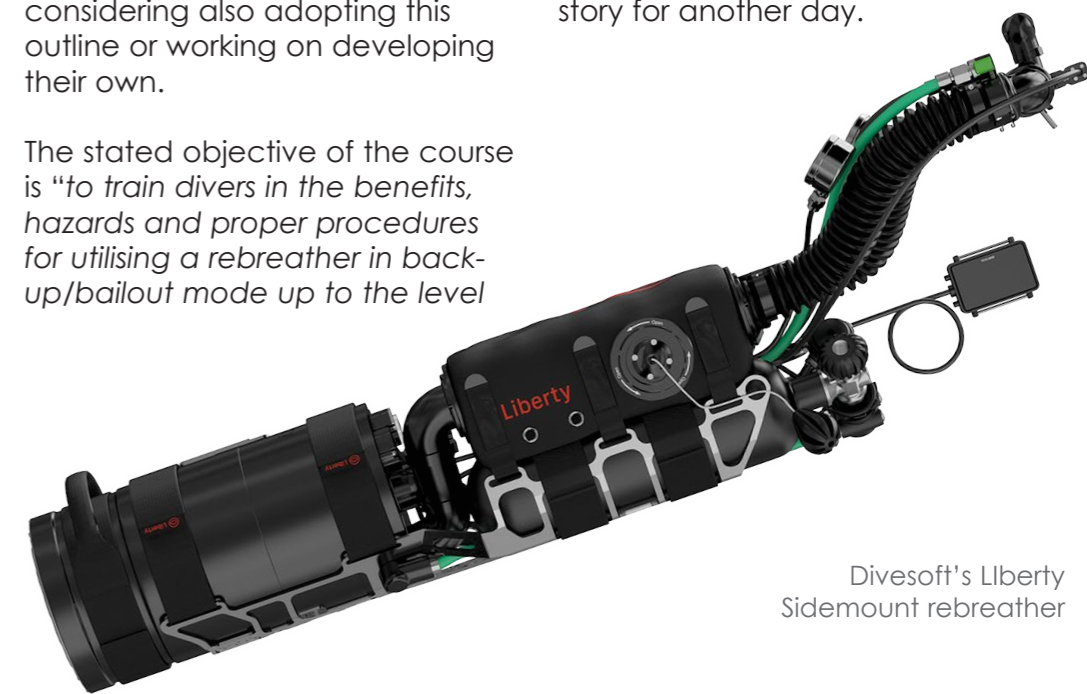
Sidemount rebreathers

There are little over half a dozen units on the market being labelled as sidemount rebreathers but almost all of them need offboard O₂ diluent or both. The only fully self-contained unit currently on the market is Divesoff's Liberty.

At the recent DivingTalks conference in Portugal, I've also seen presented a late prototype of the ECBOB (Electronic Compact Bailout Rebreather) which is designed specifically for this purpose. It is a compact design with a number of neat features and solutions but that is a story for another day.

tributor to this publication, and Jakub Simanek from Czech manufacturer Divesoff collaborated on putting together the course standards which have now been adopted by TDI. It is understood that other agencies are either considering also adopting this outline or working on developing their own.

The stated objective of the course is "to train divers in the benefits, hazards and proper procedures for utilising a rebreather in back-up/bailout mode up to the level



Divesoff's Liberty Sidemount rebreather

GUE Releases New Version of DecoPlanner Software

Global Underwater Explorers (GUE) has released version 4 of DecoPlanner, their dive planning software. It is available as an app for iOS and Android as well as has desktop versions for Mac and PC.

Modern dive computers are fantastic tools that are getting still easier to use and with clear and nicely designed interfaces that are easy to read and intuitive to use. Many of the later models are also great looking wearable tech and sleek enough to pass for a fancy wristwatch.

But wouldn't it sometimes be nice to have a closer look at what's behind those shifting digits and mechanics of decompression calculations?

Enter decompression software, such as DecoPlanner, which provides the user with precisely such as a window into how dive profiles and decompression are calculated.

By saying that one can 'toy' around with this software and try all sorts of settings and see what happens I don't mean to imply this is a toy. Because it is certainly not but a valuable tool and a great aid in planning a dive, in particular when decompression and change of gases are required.

Visual aid

It is a tool that will display, in the form of graphs, how depths and dive time can be matched with various choices of gases and tank sizes while, say, visualising how various tissue compartments on-gas and off-gas during the dive. In doing so risks get highlighted so one can easily mitigate them by making better and safer choices.

Let's look at some simple examples. Say, I plan on visiting a wreck resting at 30m. I will use

32% Nitrox on the bottom (staying for 25 mins) and 50% from 18m where I plan a 10-min stop before ascending. Since I am a right wuss I want to keep a wide berth to any significant tissue loading, and I don't want to carry heavy tanks. This software shows me that I can do away with using my 2x7 litre twinset for the bottom gas and an Alu40 (5,7 litre) sling tank for the ascent, and have some gas to spare.

Another dive to 45m for 50 mins, on the other hand, would require the use of 2x18 litre twin tanks and an Alu80 (11 litre) with 50% Nitrox for accelerated deco. Decompression will also result in an ascent time of 59 mins and 119 mins of total dive time. This dive is outlined on the graph on the right, but with a different display.

These oversimplified examples

are just scraping the surface of what this software is capable of as we haven't even made a mention of trimix or open circuit which is where its strengths come to the fore. There is also a long list of options for setting parameters and preferences which can be seen on the right side of the screenshot above.

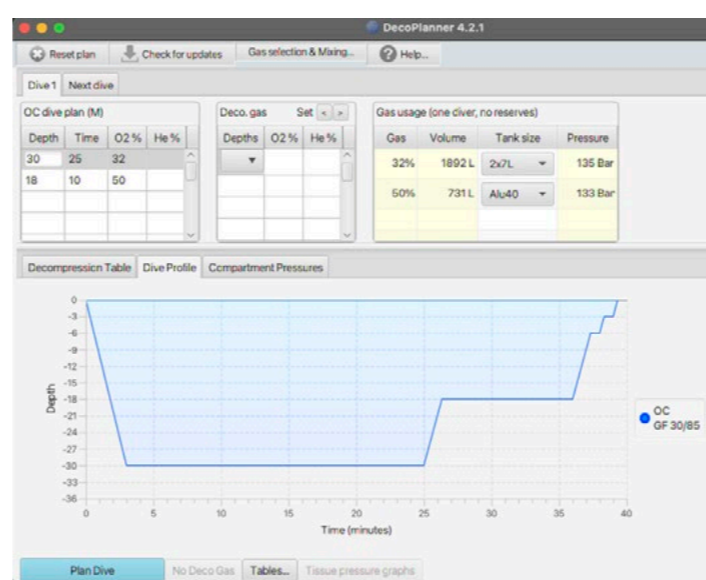
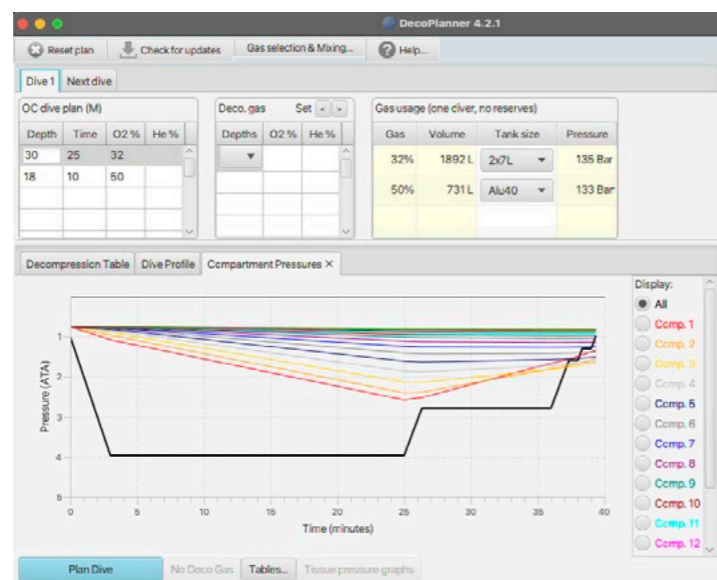
Try it

But you can explore it for yourself as you can now get a free 15-day trial license here so you can try it out before deciding to buy.

► **DecoPlanner 4 software download from GUE's website**

DecoPlanner 4 is a complete rewrite of previous versions, and now includes convenient features such as:

- CCR and OC planning
- graphical comparison of dive profiles, such as CCR vs. OC and/or ZH-L16 vs. VPM-B
- Improved tissue pressure graphs
- Easy self-updates when a new version is available



Poseidon Launches App

The app, which is called Reef, is a dive planner for both open circuit and rebreather divers. It offers different dive modes and deco models available to match any setup and preferences regardless of level. It calculates needed stops for both single and series of dives and let you analyse your dives. It lets you tune gradient factors to see the difference in

dive time and get a summary of the result as well as a detailed list of run time and gas switches if applicable.

By connecting it to a Poseidon dive computer after the dive the app can visualise data such as depth, water temperature, tank pressure, loop temperature, pO₂, alarms and more.

Poseidon.com

Tip: Don't attempt to export rebreathers to Libya if you don't want to go to jail

Remember Peter Sotis? He was Rob Stewart's dive buddy when the filmmaker tragically lost his life on a deep rebreather dive in 2017 resulting in him getting sued.

That wasn't the end of his woes, however. A federal jury in Florida has just convicted Sotis and Emilie Voissem of participating "in a scheme to cause the illegal export of rebreather diving equipment to Libya in August 2016." The pair is now facing a penalty of 20 years in prison and a million-dollar fine.

Because rebreathers have both civilian and military use they

are on a list of dual-use items that are export controlled and licensed by the U.S. Department of Commerce, Bureau of Industry and Security (DOC-BIS). As such a license must be obtained in order to export rebreathers to any country with national security concerns, such as Libya.

According to US Dept of Justice, the defendants willfully attempted to export those items after receiving an instruction from a Department of Commerce special agent that such items were detained and not to be exported while a license determination was pending.