

Some ideas on creating and using a Hogarthian/DIR-Style Side mount Configuration

By HRK

Cave diving on and off since getting my full cave certification in 1992, my gear has evolved from the wild, anything goes, French Indi-style to the now more "socially acceptable" Hogarthian or DIR-Style double tank configuration. On occasion when we dove a cave which had one or more restrictions limiting access on doubles, it was necessary for most of us to each developed his or her own way of taking and mounting tanks in some kind of a side mount configuration. They all work somehow, but it had always bothered me by requiring a more or less completely different approach to handling my gear than was ingrained from diving with a standard Hogarthian/DIR configuration.

I know there are several manufacturers that in the meantime fabricate and sell special kits for side mount diving. I am quite sure they all have there merits, but firstly I did not care to spend a lot of money for another dive toy which I probably will not use very much and I wanted to see what I could whip up with stuff I already had lying around. Furthermore I desired a simple to use system which came as close to back mounted diving as possible. Searching the internet for DIR-Style side mount articles, I did not find anything very useful. I did find some stuff about DIR-Sidemount by G.I. the 3rd , but I did not necessarily find his irate rantings very useful.

Anyway, the last 2 years or so saw me playing around with my gear on occasion in an attempt to create a simple to kit up configuration which requires no changes in my standard diving reflexes other than regularly switching regulators because of the missing isolation valve. After a couple of unsuccessful attempts, I think I hit the right road...

Now, if you are a hardcore DIR-Diver that gets stomach cramps and cold sweat outbreaks at the thought of having to dive with a back plate that has more than two shoulder D-rings and more than one waist D-ring, read no further! Consult your favourite psychiatrist and hope for a successful treatment....

If you are intellectually more flexible and interested in broadening your horizon, please read on!

First I defined what I wanted:

- 1) to be able to use a wing as a secondary inflation system other than my dry suit.
- 2) to have my regulators fitted and positioned in the way I was used to. E.g. with a necklace and a long hose
- 3) keep the hose routing the same as with doubles
- 4) be able to use a standard canister light
- 5) to have backup lights where I always have them
- 6) to be able to take, easily mount and use any available stage rigged tanks from my slender 4 Liter steels to aluminium 80's
- 7) as I have back problems, I do not want to have to use a weight belt. I want the weight distributed evenly over my back.

The easy part was to take a single tank wing which I already had and sandwich it between two back plates. The single tank wing keeps a far slimmer silhouette than a



larger double tank wing and does not require the use of any bungees for containment or restraint. When used with a properly fitted and weighted dry suit, it most probably will not be needed for inflation use except for slight trim adjustments and as a

backup inflation system. I first used a thin stainless steel plate (2.6 kg) for the back and for added weight a heavy 6 mm plate (5.2 kg) for the front with the webbing. As I later found out in tests, when diving with heavy steel tanks (e.g.: 300 bar 7 Liter tanks) the 2.6 kg thin back plate can be replaced with a light aluminium back plate. When diving with lightweight tanks such as carbon steels or aluminium stages, you will need the added weight of the second steel back plate if you do not want to use a weight belt.

You can add additional weight if necessary by sandwiching a 3 kg bar of lead between the plates along with the wing. For even more weight or trim weight, you can cast some lead in the V of the front back plate and attach it with the two screws that hold the back plates/wing together.

For experimenting around with different tanks, I mounted 4 chest D-rings and 3 waist D-rings plus the D-ring belt buckle. This makes it easier to change tank positions under water to find the optimal attachment points for a streamlined and well trimmed configuration. Once you are satisfied, you can always remove any D-rings you feel you don't need.

I have found that for me, the ideal placement for the D-rings to be:

Two D-rings roughly at the same shoulder height as on your back mount rigged back plate. Here you can mount your backup lights, clip off your primary light and the long hose when using your left post regulator.

The two other D-rings are mounted approximately under your armpits. I clip the heavy steel tanks off here. Clipping them on to the higher shoulder D-rings will cause you to be top heavy. Decent trim is not possible.

Two waist D-rings are mounted at the extreme ends where the webbing enters the back plate. This is where I normally clip off the lower tank bolt snaps to start off with.

A combination of moveable D-ring belt buckle on your right side with further forward mounted D-rings on your left side, allow you to pull your lighter tanks down, closer to your body.

The hardest part was to integrate the wing bladder with inflation from the side mount tanks without having to have help with kitting up or not being able to kit up in the water. I found the answer to this problem in the form of a small 3/8" x 3/8" UNF female-female adapter. One end goes on the end of a standard inflator hose (70 cm) along with a standard inflator nipple. The quick disconnect stays on the wing inflator, the rest of the hose goes around your neck, a shortened inflator hose (5 - 10 cm) mounted on the first stage of your right side regulator allows for easy connection as soon as your right tank is clipped on to your harness. This allows for a clean and efficient hose routing and stays conceptually the same as with Hogarthian doubles.



You must realise, that the system I am developing is a dedicated system, such as with back mounted doubles. The tanks are an integral part of your weighting system. *It is not intended to remove a tank and pass it on to fellow diver that is out of air, as you would with a stage tank.* Therefore, my long hose goes on this right sided first stage too. Part of it is stuffed under the bungees as you would with a standard stage regulator, the rest of the hose goes around your neck like your standard long hose.

An overlook on the regulator rigs:



And a similar view on the tanks with attached regulators:



Hose length around your neck is easily adjusted by pulling the slack under the bungee of the right sided tank.

The second problem was in being able to mount and dismount a canister light on my right waist belt and still be able to hook up a stage on a waist belt D-ring. For this I took a metal belt buckle and mounted a sawed up D-ring as the axis for the buckle (next foto below). I now have a belt buckle to secure my canister and if needed a flexible and adjustable D-ring for mounting a stage on my right side.



buckle closed



buckle open

The left sided tank is equipped with a shortened inflator hose (15 – 20 cm) for dry suit inflation. I found, that mounting the short hose with a swivel between the hose and the first stage allows better hose placement and movement to your dry suit, depending on the position of your left tank. The left post second regulator is fitted with a necklace and mounted on a 90 cm hose and goes around your neck. The same principle as with standard back mounted doubles.

Here I also tried an alternative method of dry suit inflation. Instead of the shortened inflator hose, I use a small 0,5 Liter 200 bar aluminium Argon bottle, wreck mounted, for dry suit inflation purposes. My feeling was to improve my personal safety by having a dry suit inflation source without having any tanks mounted. This meant especially for the scenario when kitting up in the water. If you slip or fall into deeper water without your fins on and without tanks or with partially mounted tanks, you might not have the possibility to inflate to the surface...

Whatever you choose....they both work beautifully...the small wreck mounted bottle does not hinder or interfere with the left sided tank...



I also attached 2 bungee cords to the top portion of the back plate to enable pulling the neck of the tanks closer to your shoulders, if I so desire. The bungee ends can be clipped off to your shoulder D-rings. I believe this is an approach often used by Martyn Farr and others. It's definitely worth a try in seeing what it will do with tank positioning. Easily removed if you don't want to use it.

After extensive trials, I found that some form of bungee cord to pull the tank necks close to your body or under your armpits to be indispensable. This enables a slim, streamlined tank positioning. Without the bungees you are essentially diving with a dangling left and right tank, not in a clean sidemount manner.

Now experience has shown, that when diving with light tanks such as 7 Liter 300 bar compound tanks (e.g.: carbon-steel) or aluminium 80 cf stages.. the tank bottom starts to lift upward as the pressure decreases, also causing the tank neck with the first stage regulator to twist around 90° or further, making it bothersome to read tank pressures on your SPG. To compensate this, you will have to detach the lower bolt snap and clip it farther up toward your belly, alternatively use a piece of weight belt lead with a cam band to make the tank bottom heavier or take a piece of bungee with a bolt snap at each end which can be used to pull both of the lower stage bolt snaps down to you hips and across your belly to keep the lighter stages (Aluminium or Carbon) from floating up too high when the pressure decreases or when filled with helium based gases. This does not seem to be necessary when using heavier steel tanks.

At the moment I'm quite happy with the rig as it is. It's taken some time to find the optimal hose lengths and D-ring placement, but it now seems to be an excellent starting point for further experimenting with different stage tanks. I can take any stage rigged tanks, put a left and right side first stage on it and quickly attach to my wings and dry suit. Easily done in the water, on a boat, at a cave... I love the feel of diving it with 2 slender 4 Liter steel tanks, makes me feel like a fish. With the two 4's I can spend up to 2 hours in the 3-6 m range doing photography with a real light and easy to carry gear.

In the meantime I have also been diving the rig with two 7 Liter 300 bar carbon tanks...In water they react like aluminium stages, but are lighter and more slender. The gas reserves are quite useful for longer or deeper dives than with two 4 Liters. The drawback is that the tank bottoms start to rise up (same as with aluminium 80's) when they get lighter. Which means, if it bothers you, you have to find a way to pull the ends closer to your body. See above three methods.

After doing a lot of dives with different tank configurations, my personal "dream team" is definitely the above rig with two 7 Liter steel 300 bar tanks. (Tara: approximately 9.6 kg each, no gas, no valves) The tanks are heavy enough to stay horizontal even when empty. Fit nicely under your armpits. A sleek and very comfortable rig. Trim is perfect! A really wonderful ZEN-like feeling underwater...become one with the water! Just love it. No doubles can compare....

Some fotos of the overall configuration:



Above fotos:

Rig with 7 Liter 300 bar steels. When in the water, the yellow bungees pull the tanks up under your armpits, making for a perfect fit and trim, on the surface, of course, gravity pulls them downwards.... The left foto shows the wreck mounted Argon bottle as well as the bungee for the tank neck while the right foto shows the attached wing inflator, etc..

This is definitely not the end of the road, but a nice starting place to get more experience...I feel very comfortable because, switch breathing of the regulators aside, all handling, hose routing, etc. is basically the same as when diving doubles. Also when diving with a buddy on doubles, it's easy for him to grasp and understand your gear configuration as it is basically the same as with a Hogarthian back mount.

This rig is definitely not designed for diving extremely tight passages, but great for easy access to restrictions which are troublesome for doubles, besides being a lot of fun in playing around and experimenting with new gear. For people with a bad back, you can carry single tanks more easily to the dive site than a double.

As always I am thankful for all types of feedback, new or refined ideas and/or critique.

Safe diving.

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