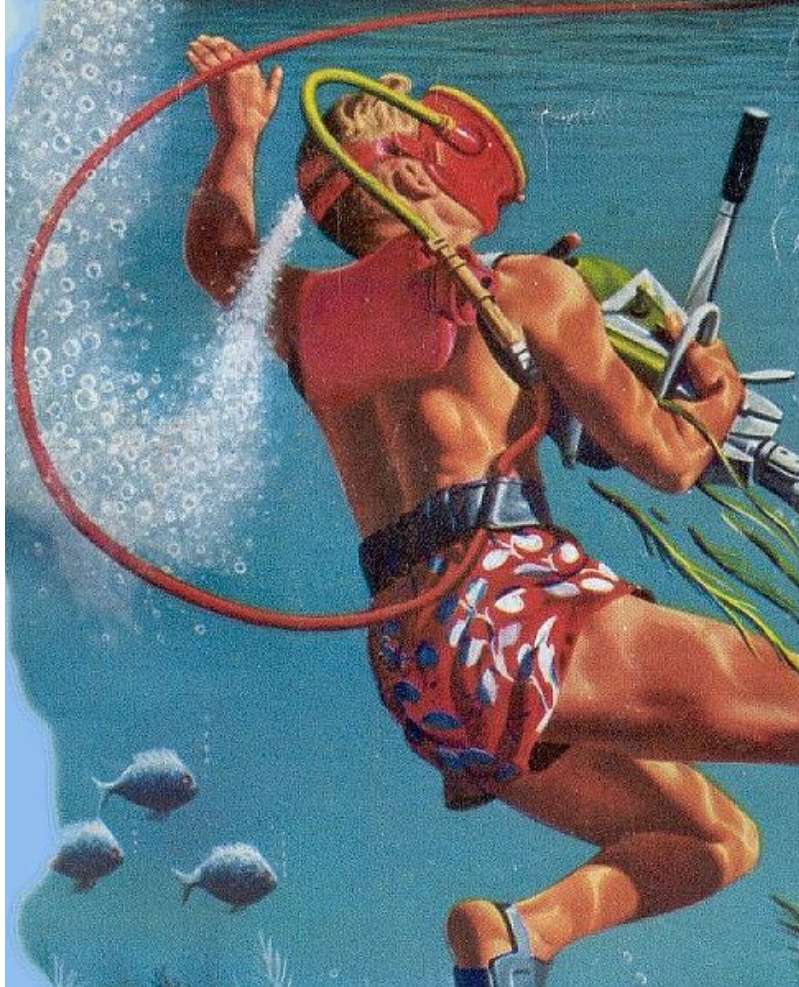
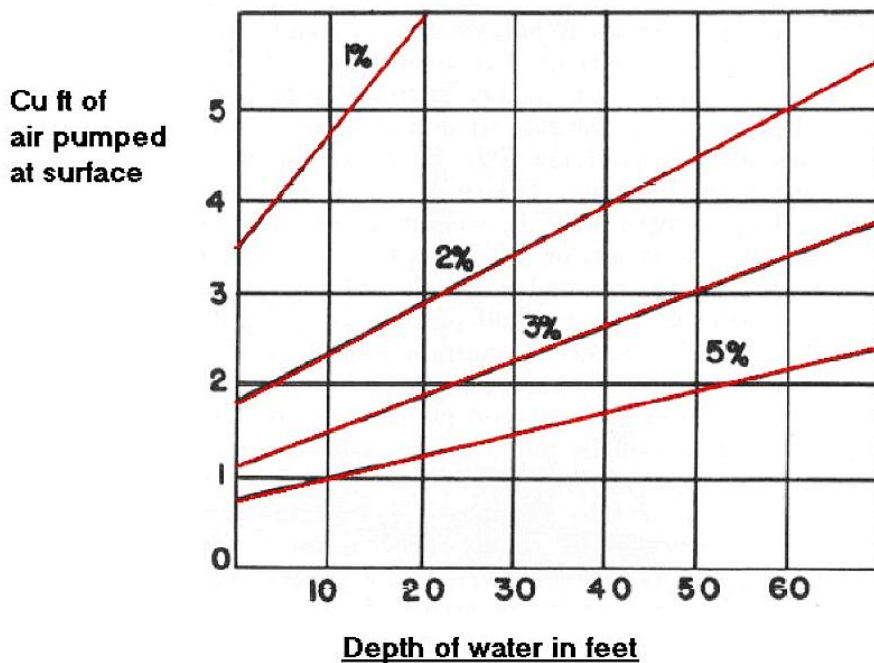


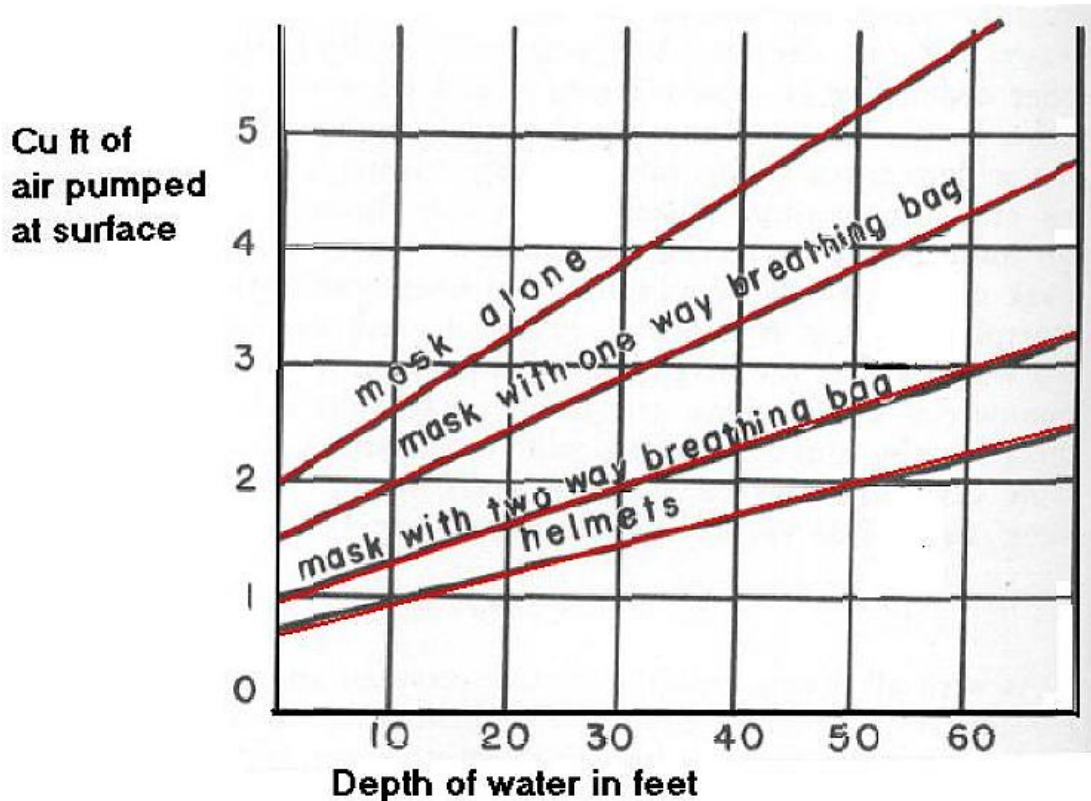
Improving Your Diving Rig

So far I've recommended employing compressors which far exceed the demand of diver(s). Back in the 50's the US Navy figured out ways of maximizing the primitive. The solution was to employ a breathing bag in conjunction with hookah type rigs



This graph shows the supply and demand in relation to water pressure. Also check the math section on the original file. More on this later.





This graph illustrates the demand on the compressor using different diving gear. The most wasteful is mask alone, next one way valve, more efficient is the two way valve which is covered in the following project, and most efficient are div helmets.

START BY CONVERTING A STANDARD SNORKEL

Originally published in 1954 June issue of Popular Science

Before you even consider diving you'll need an adequate air supply. An air hose hooked up to a face mask will bring air down to you from a pump or compressor on the surface, but you'll need a breathing bag to make breathing easy and a check valve to keep air from running back up to the surface. An exhaust valve is needed, to bleed off excess air and ke water out of the mask. Finally you'll need a weight belt to neutralize your body's buoyancy. All these things are necessa to build a diving outfit.

Hot Water bag stores pure air, diverted into it while you exhale. Large diameter hose lets you draw freely on this reserve.

The type of mask used for this project was a Medusa type mask. Other types require some fabrication. Check the section on vietnamese diving masks in the original Build Your Own Hookah And Shallow Water Diving Helmet text, for details on adapting a modern mask.

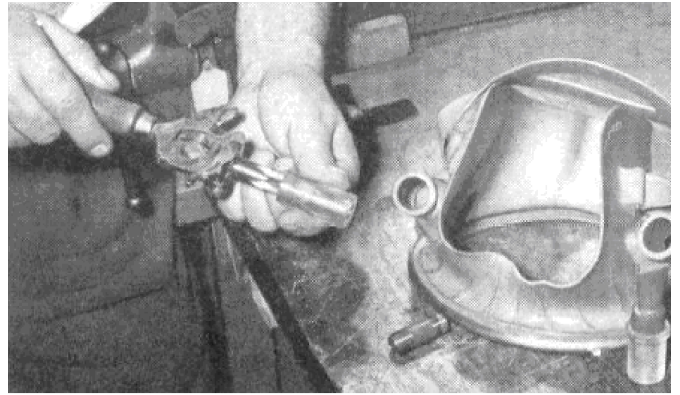
Also suitable are fireman mask conversions. Skip the instructions on building the flutter valve as fireman's masks already come equipped with purge valves. Also suitable to use with breathing bag is the power snorkel/ continuous flow mouthpieces we've discussed earlier.



Most of the plumbing parts for this project can be purchased at Home Depot or Lowes. You do not need to acquire the stock tubing cut and thread it. Lowes also sells different type spring sets as for the steel ball, use the type sold for sling shot, you can get a bag full of them at home depot.

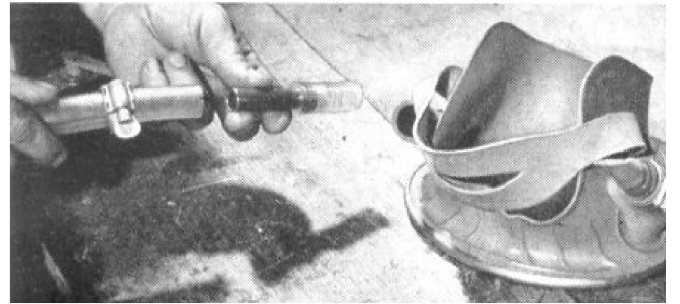
Exhaust valve.

This is the easiest part to make, so you might as well make it first. Cut a 2" length of 7/8" diameter clear plastic rod, and drill a 1/4" hole throughout it. Dab some cement on the end and slip a rubber flutter valve or a novelty store noise maker (whoopee cushion) over it. Don't drill the hole bigger than 1/4" or use plastic tubing or the valve might turn inside out and flood the mask with water. After setting the valve in place secure it with a clamp, or wire tie.



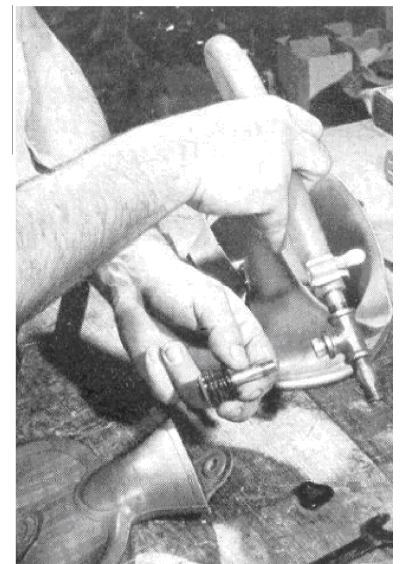
Air intake.

Begin fabrication by drilling and tapping a 2" length of 7/8" plastic rod for a 1/4" pipe nipple. Slip it into the right side of the mask and lock it in place with a hose clamp. Thread a 2" piece of 1/2" ID brass tubing to fit over the exposed end. Slip over an FDA approved clear plastic hose over the brass tubing and clamp it. Make a similar arrangement of tubing threaded over a nipple and slip it on the other end of hose, then screw a 1/4" brass tee to it.



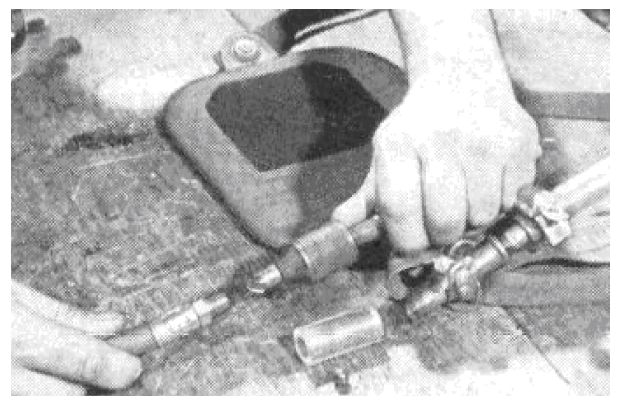
Check valve.

Screw a 1/4" nipple into the opposite end of the tee and cut a 13/4" length of plastic rod for the check valve. Drill a 7/16" hole through the rod and thread both ends with with a 1/4" pipe tap. Screw the threaded rod onto the tee and insert a light 3/8" diameter brass spring and a 3/8" steel ball in the opening. Close the open end of the rod with the standard 1/4" air hose fitting, countersinking it's opening to form a seat for the ball.



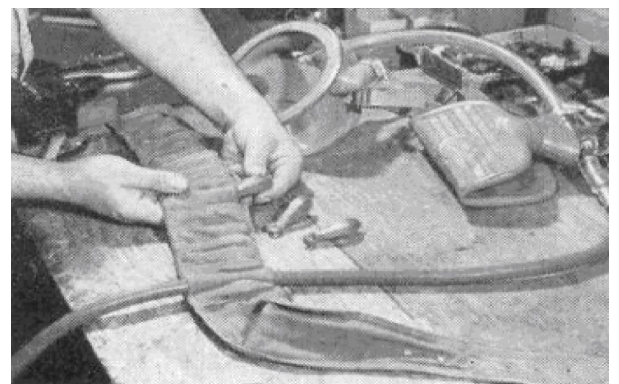
Breathing bag.

Use a 2 quart hot water bottle to capture and store the air coming from the pump while you exhale. Drill and tap the stopper (cap) for a short 1/8" to 1/4" bushing set in the center leg of the brass tee. Fashion the shoulder harness from a 1" web strap. Form a loop at each end of the hot water bottle and stitch a short piece of strap to each loop to buckle across your chest.



Weight belt.

A 20 pocket shotgun ammunition belt makes a perfect weight belt. Fill all the pockets except for one with lead sinkers. The last hole is reserved for the airline. Simply slip the hose through the hole this will act as a shock relief, and will prevent the mask from getting pulled off. As an additional safety measure wrap tape around the hose to prevent from slipping trough the loop.



Additional weights.

If you find sinkers are not heavy enough to neutralize your buoyancy with the breathing bag filled cast a few extra weights, by melting tire balancing weights found at salvage yards, into 3/4 inch water pipe molds.

How a typical breathing bag is worn

By adding a breathing bag to your diving setup, you can use high volume tire inflators (compressors). One suitable 12 volt compressor is the SuperFlow model mv50, puts out 2.54 cubic feet/ 72 liters per minute at 30 psi, and this little compressor will top off at 120 psi, but that's not all it also comes with it's own canvas carry bag, Built in air filter, 16 foot quick connect hose and a lot more. Best of all you can buy one of these beauties for less than \$50. These compressors are used by 4X4 off-road enthusiasts, whose giant tires need high volume compressors. There are other brands of tire inflators out there suited for shallow water diving, I'll keep you posted on more findings. Check your local auto supply stores if they carry SuperFlow or similar brand. I've seen one of these turn up on eBay starting at \$60.

Here's a source <http://www.partsamerica.com> they seem to be out at the moment, also of interest <http://www.moabjeep.com/superflow.htm>

Another compressor source but less volume and more money <http://www.airzonetents.com/tornado-air-compressors.htm>

If you check the second graph you'll notice a mask with a diving bag supplied by a SuperFlow compressor will safely allow a diver to go down to 30 feet, and beyond, the same is true of helmets.

