Great ideas and tips from PBO readers

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Travel time made simple

David Roulston's 'Screw-Gap' device can help you estimate time of arrival

When sailing on my Peter Duck ketch on the South Coast, or across the Channel, I often want to know how long it will take before we reach the same point as a ship heading towards us, or estimate the time to a significant stationary object without recourse to determining our position on the chart.

I realised that a simple screw set in a three-edge device would solve this problem.

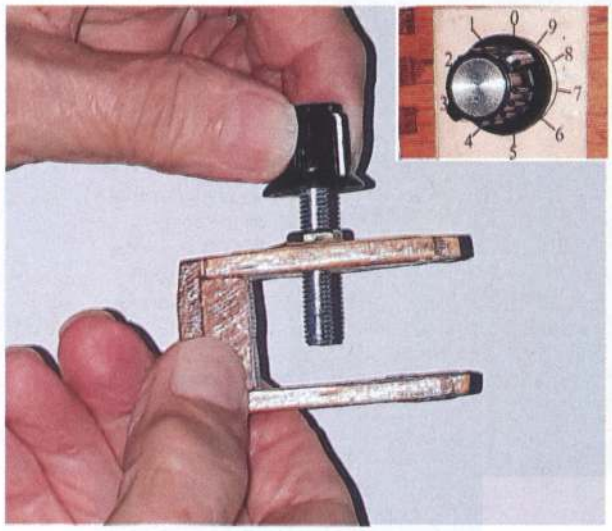
The dimensions of the wood structure that I created are 3cm x 3cm x 5cm but could be larger.

I used a standard 6mm diameter bolt size with a 1mm thread held in a nut embedded with Araldite to one surface.

The other inside surface is at a distance slightly exceeding 20mm.

I created a dial on a word processor (but it could be carefully drawn), then marked in numbers 0 to 9. I glued and varnished the dial to the top surface. Each complete turn of the screw corresponds to 1mm (the thread size), therefore each notch on the dial is 0.1mm.

The knob with the pointer was a standard electronic control switch.



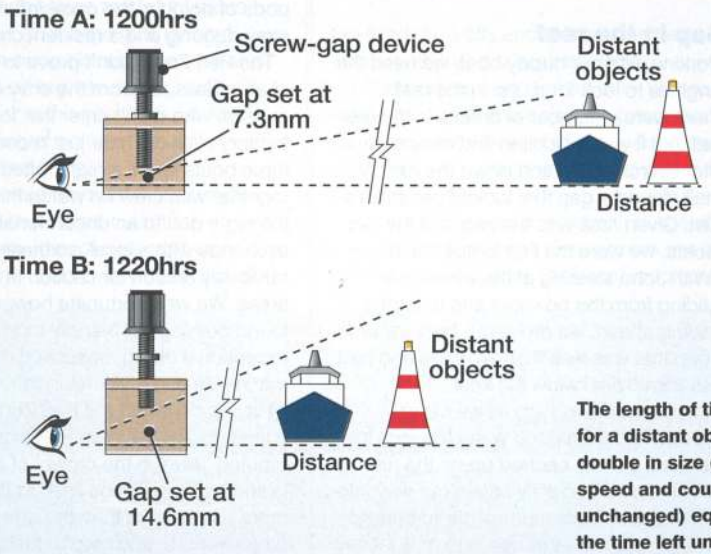
LEFT Squinting through this adjustable aperture at arm's length it should be possible to estimate time of arrival or intersection quite accurately

INSET Viewed from above, each number on the dial represents 0.1mm and a full turn is 1mm

How to use it

Hold the device at arm's length and adjust the screw to line up the distant object as precisely as possible between the flat surface at the bottom and the base of the screw. Measure the gap by noting the dial value (eg 3), which is tenths of a millimetre. Then count the number of full rotations (eg 7) until the gap is closed. In this example G = 7.3 mm.

To estimate your time of arrival or intersection, carry out step one, above, and note the time (time A). Then turn the screw anticlockwise to set the gap to twice this value (in millimetres: eg 14.6mm). Observe the object with the device still at arm's length until the object fills this new gap. Note the time (time B). At constant speed, the



The length of time it takes for a distant object to double in size (providing speed and course remains unchanged) equates to the time left until arrival or intersection

Easy-read version

Use a thin disk on the base of the rotating bolt and attach a scale with bars every millimetre on the inside of the cuboid. It's quicker and easier to 'read' the size of the gap, but it takes more time to construct.

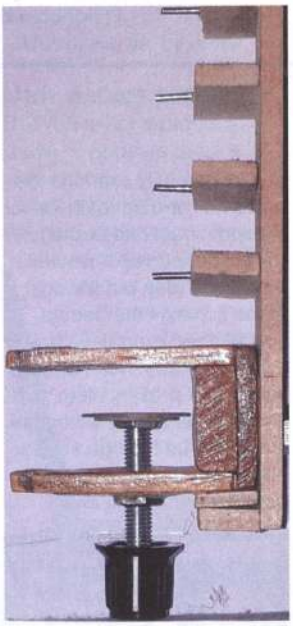
Alternative version

time difference will be the same as the time remaining before reaching the object. In other words if the difference between time A and time B was 20 minutes, you have 20 minutes until arrival or intersection.

This simple gadget is small enough for the helm to carry in a jacket pocket and may help to inform appropriate course and/or speed alterations.

Further uses

This screw-gap device can also be used to measure the thickness of ropes or wood or metal sheet before ordering replacements. The device gives accuracy to better than 0.1mm. The device can also be used to estimate angles subtended by distant objects, eg lighthouses. Held at a distance L from the eye of the user, the angle in degrees subtended is equal to (G/L)x 57.3. If the screw is held at a typical arm's length of 570mm, a screw gap G of 10mm is approximately a subtended angle of 1°, or about 2° when held against an elbow. The angle range can be increased from 2° to 10° (at arm's length) by bolting on a strip of wood with pins at exactly 20 mm intervals extending above or below the zero gap surface, as illustrated below.



For measuring subtended angles up to 10° at arm's length

Pump up the volume faster

Chris Evans uses standard pipe fittings to extend his pneumatic pump range

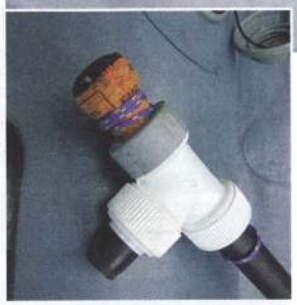
This device solves the problem of pumping up the chambers of a rubber dinghy to equal pressures. It also enables two pumps to work in tandem.

It's made of 22mm polybutylene plastic semi-flexible water pipe, and about £10 worth of plastic fittings.

The 22mm pipe is a snug fit in the dinghy's valves. To ease insertion, I tapered the ends of the pipe using a sander.

The stainless steel 'sharks teeth' in the plumbing fittings hold the pipes securely, but still allow rotation, so the contraption can fold very easily.

The pump nozzle fits the plumbing fitting, but the stainless steel tooth ring should be removed, otherwise the nozzle will be ensnared.



ABOVE It looks ungainly, but the two lengths of pipe rotate neatly around the double right-angle joint for easy stowage
LEFT The cork is used when only one pump is connected to the device. Note the tapered end of the 'tee' which helps insertion into the boat's valve

To speed inflating the dinghy, we sometimes have two people using a pump each. Removing the champagne cork from the second T-fitting allows a second pump to be connected.

The double right angle joint in the centre allows the device to fold for stowage and also accommodates different size dinghies (we have three Avons of varying sizes), by allowing movement during inflation.

A flexible hose would achieve the same, but would be more of a tangle in the locker.

Plunging in to engine cooling

Robert Emberton feeds his engine with water ashore

After various attempts to supply cooling water to my boat's engine on the hardstanding by disconnecting the cooling tubing to insert a hose connector, I thought there must be an easier way without feeding a hose inside the hull.

It was the toilet plunger that gave me the idea. I bought one that enables you to unscrew the short handle and replace it with an extendable curtain rail. I then fitted a simple hose connector through the rubber cup of the plunger.

Place the rubber cup under the hull's engine cooling inlet and wedge the extendable pole to the ground. Connect a hosepipe and that's it. It's rough and ready, but it works!

A hose connector is fitted through rubber plunger and a telescopic arm props it up against the hull for a good seal around the engine raw water cooling inlet