
From: "Alex Deas" <ardeas@ibm.net>
To: "Martin Parker" <MartinParker@dialin.net>
Sent: 10 June 2000 10:17
Subject: Final handset suggestions

Dear Martin,

By the way, I will never act as an expert witness for any legal actions. I disagree fundamentally with folk sueing manufacturers who are doing their best to provide better adventures. I would not dream of selling the unit to an American until the unit was really fail safe.

I don't know if it is a PIC chip or an 80C51 series microcontroller you use, these being the two most obvious though there are many others. In any case, the core of the handset should be a state machine with known fault tolerance. A microcontroller has zero fault tolerance, and almost zero fault observability.

The state machine would be a big sparse PLA - any of the static CMOS FPGAs will do the job. The microcontroller if it is used at all should only be an I/O device. You could even replace the microcontroller with an FPGA, with a state machine to run the display, another to get the data from the ADCs, etc.

I have had good experiences with power up reset chips from Maxim and Linear Devices. I don't know what you use at the moment. I stopped using a resistor, diode and capacitor for reset years ago.

The criticality of the batteries is such that I am surprised the unit does not do a battery check prior to Dive Now?, report on the levels and refuse to dive if they are low. A better power management chip would also help: a Maxim switched mode regulator chip that would work over the widest range, and a decent shutdown when the power droops.

I will do some tests on what batteries do under pressure. Meanwhile, I'll replace the batteries every time I replace the sorb. I was paying £9.95 for the batteries from Comet, but from a link posted on the inspiration net, I found batteries at £2.30 each from 7daysshop. Net address is <https://www.7dayshop.com/acatalog/index.html>

On your favourite topic, mods, if I did my own handset, I would change the display to a custom LCD with an electroluminescent backlight, showing both tank pressures and depth, and integrate into the handset Chris Parrett's Abyss's trimix/CCR dive computer - of course mine would be in feet. That way I would only need to look at one thing for the whole dive! Custom LCDs are much better than the dot matrix - much wider viewing angle because they are not multiplexed, with more to display, in an idiot proof format. In very dark conditions, it is hard to read the current display even with a torch shining on it.

With best regards,

Alex Deas