NEW TECH

The latest marine engines and innovations

NAVIGATION
Mel Bartlett

PRODUCTS
Nick Burnham

Hugo Andreae, *MBY* editor, demonstrates an early prototype of the clever new kill cord alarm

PROTOTYPE 1

The first working prototype used a strain gauge to sense when it was being worn

Choose life

MBY has teamed up with an entrepreneurial reader to launch Lifecord – a new type of kill cord that you can't forget to wear

Four years ago, *Motor Boat & Yachting* issued an open challenge to the industry to design a better kill cord. Only now, after countless hours of research, development and testing are we able to reveal the result of that challenge – a revolutionary new kill cord that we believe is the solution we've all been waiting for.

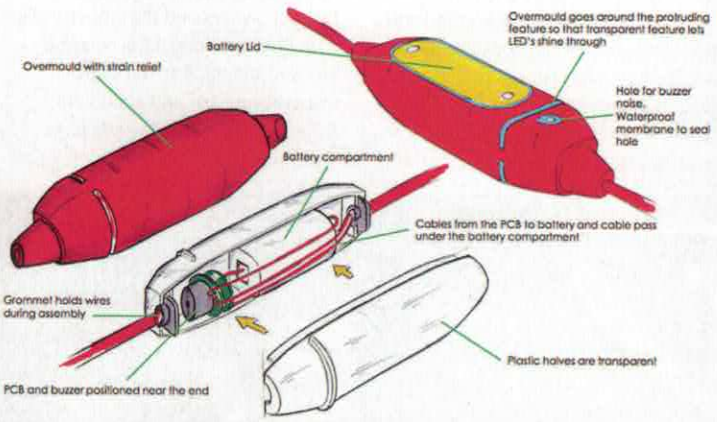
Called Lifecord, for reasons which will become apparent, it is as simple as it is clever. Rather than trying to replace the kill cord with something completely different, its designers have stuck with tried-and-tested technology and focused instead on the problem of people forgetting to attach it. In other words, it's still a kill cord but a 'smart' one. It uses the same hardware and works in the same way as a conventional kill cord. It fits any new or secondhand boat that already has a kill switch and requires no specialist installation. And, most importantly, it will cost les than £100, so everyone can afford it.

The reason it's so much better tha a conventional 'passive' kill cord is because Lifecord has an intelligent alarm system built into it that knows when you're wearing it and, more importantly, when you're not. If it senses that you've forgotten to atta it, after a ten-second pause it will sta to flash and beep, gradually increasi in volume, until you do. The really clever bit is that it can sense when it's round your leg or attached to a lifejacket rather being looped on to itself, so you can't easily deceive i

Remarkably, Lifecord hasn't been developed by one of the big boat or engine manufacturers but by an entrepreneurial *Motor Boat & Yachting* reader who responded to our challenge and came to us with h

PROTOTYPE 2

This basic 3D printed model was used to test the new magnetic clasp and key



Early drawings of the battery compartment with its integrated alarm

PROTOTYPE 3

The third working prototype was used to test the volume and visibility of the alarm

idea. Sensing he was on to something, we put him in touch with a trusted marine supplier and helped him to develop his idea into a sellable product that will soon be available to buy in chandleries the world over. Only now that patents have been granted and full-scale production is about to begin are we able to reveal the full story behind this remarkable new lifesaving invention.

THE TRIGGER

The event which triggered *MBY*'s call to action was a horrific accident that occurred in May 2013 off Padstow in Cornwall when Nick Milligan and his daughter Emily were run down and killed by their own RIB. The story of how and why the accident occurred is as long as it is tragic but the crux of the matter is that neither Nick nor his wife Victoria noticed that they had forgotten to attach the kill cord when she took the helm for the short journey home. This meant that when all six family members were thrown from the boat during a tight turn, the RIB continued to circle at speed, killing Nick and Emily and severely injuring Victoria and their son, Kit, then four.

Like everyone, we were deeply shocked at how such a small and easily made mistake could have such devastating consequences. We've all forgotten to attach a kill cord at times, mercifully without the same tragic outcome, but the sense that if it happened to someone as responsible and safety conscious as the Milligans (both Nick and Victoria had attended RYA Powerboat Level 2 courses) made us question whether the current design of kill cord is the best possible solution. Yes it is simple, reliable, cheap and effective, but it is far too easily forgotten, ignored or used incorrectly. We challenged the industry to come up with a new solution that designed out the possibility of user error.

John Barker (left) shows his idea to *MBY* editor Hugo and the team from Landau UK

Various proposals were put forward including sprung throttles, wireless kill cords and even touch-sensitive seats or steering wheels, all of which would cut the engine when the helmsperson was thrown from the boat. We put these ideas to the main outboard engine manufacturers, who felt that all the suggestions had major drawbacks and the best option was to stick with what they knew. In their view, there wasn't a problem with the design of the kill cord itself, the problem was with the people using it. In fairness, the majority of *MBY* readers agreed that better training should still be the primary focus, at least until an effective alternative could be found.

MAN WITH A PLAN

For one determined *MBY* reader, that day couldn't come soon enough. John Barker had already had one brush

with a fatal kill cord accident when an employee at his local chandlery was killed during a customer sea trial at the Southampton Boat Show in 2000. When John heard about the Milligans' accident in May 2013, he knew something had to be done. "I could feel their pain," says John. "The tragedy is that forgetting to wear the kill cord was an inadvertent slip, not a conscious decision."

John already had the basic idea for a kill cord alarm but until that point, hadn't taken it any further. It was only when he read *MBY*'s appeal that he was spurred into action. He set up a meeting with *MBY*'s editor Hugo Andreae in 2014 and showed him his early sketches of how an alarmed kill cord might work.

Hugo picks up the story. "As soon as I met John, I knew he was on to something. The idea was blissfully simple and because it didn't involve any changes to the boat or engine, I was confident it would appeal to boat owners and the industry alike."

The next step was finding a marine business with the knowledge and the contacts to help develop John's idea into a working prototype. Hugo suggested Swanwick-based Landau UK and a meeting was swiftly arranged between Landau's CEO Ben Metcalfe, John, Hugo and product design specialists Triteq.

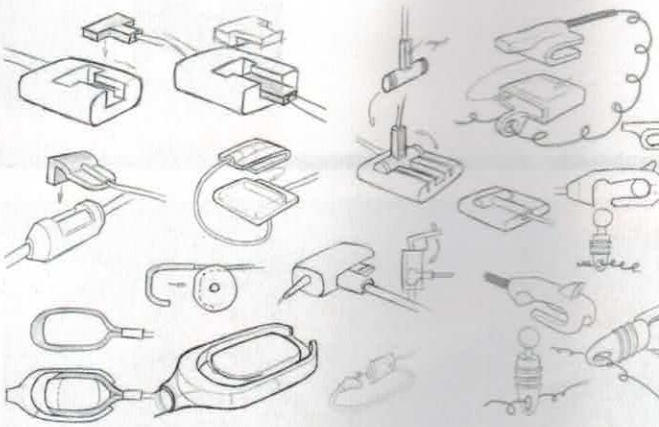
John's early sketches were analysed and a matrix of requirements drawn up specifying everything from battery life and waterproofing to the frequency and volume of the alarm. The one part of the design that John hadn't managed to crack was how to prevent users shutting off the alarm by clipping the cord back on to itself without putting it around their leg.

The first proposed solution was to use a lightly sprung strain gauge that would sense when the cord was under tension by being wrapped round a leg but would spring back into place when simply looped on to itself. The first prototype featuring this solution was ready in February 2016. The concept worked well enough but John wasn't happy with the strain gauge because there were too many delicate moving parts which could jam when exposed to salt water and sand.

MORE WORK NEEDED

It was back to the drawing board for Triteq, who came up with a number of new proposals, the most promising of which was a two-piece clip with a ball-shaped key that slotted into a clasp and slid down a short track to lock it in place. Central to this design was a pair of opposing magnets moulded into the key and clasp. When the cord wasn't being pulled tight around the user's leg, the two magnets would repel each other and close the circuit causing the alarm to trigger. When it was pulled tight, it would overcome the magnetic resistance and shut off the alarm. With no exposed parts, broader tolerances and a more robust design, it satisfied all of John's requirements.

A basic model of the new design was 3D printed to check how the key and clasp felt before committing to a working prototype. This third prototype worked a treat and included a clever new lifejacket connector but lingering concerns over the volume of the alarm prompted further refinements. Although everyone wanted the volume to start off relatively quietly and repeat every ten seconds so users were able to leave the helm briefly without driving the other boat occupants mad, it had to increase to a level at which it would be heard even over the roar of a noisy two-stroke engine. This meant a slight increase in size to house a more powerful speaker and battery so a new company, Inoplas Technology, was brought on board to keep the design as compact as possible and work out how to manufacture all the elements neatly and efficiently.



Triteq came up with several clever proposals for a new design of clasp

PATENTS GRANTED

Testing of the final prototype proved Inoplas's new design to be louder, more robust and easy enough to use even when wearing gloves.

With the patents now granted and the design set in stone, production of the first units is about to begin in a UK factory where quality can be closely monitored. We'll be revealing the final look, price and workings of the production Lifecord in next month's magazine along with de of where and when you can buy

Having played a small but significant role in the developme this revolutionary lifesaving proc we intend to follow the story thr to completion, including its laun the Lloyds approval process and hopefully its widespread adoptic by boat owners and the industry

In time, we hope it will becom as commonplace as the seatbel alarm in your car and ensure tha tragic accidents like the Milligan never happen again.

The key (right) slides into the clasp (left) to hold the cord in place

Magnets repel each other and trigger the alarm if it's not stretched round a leg

The final prototy louder, neater and when it's not being