



ABOUT THE AUTHOR

Clive Loughlin is a chartered engineer and recreational sailor and is also a regular contributor to *Sailing Today*.

We would be very pleased to hear from readers to find out how they get on using the methods proposed in this article and any others that they find work better on their particular boats.

Clive would also be pleased to hear from ST readers about any technical aspects of sailing or navigation that are of particular interest to them.

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M.O.B.

Only two people at sea and one falls overboard ... what happens next?

Could your crew cope?

In terms of nightmare scenarios, losing someone over the side is right up there with fire at sea and being run down, so if the worst happens what's the best thing to do? The question is particularly relevant if the skipper is the victim, leaving maybe a partner or wife to cope on their own. **Clive Loughlin** reports.

All photos Nick Day

Imagine the scene. A husband and wife go sailing. He's a keen and experienced sailor, but she mainly goes along to keep him company. The husband falls overboard leaving her on board and alone. What should they do to maximise her chances of saving his life?

The above scenario is, I believe, a realistic one, which acknowledges that the person left on board is unlikely to be particularly strong.

However, many seem reluctant to acknowledge it by practising what they would do if the situation ever arose.

In this article I hope to address the basic problem and suggest the simplest possible actions that should be taken by both the 'wife' and the MOB. The

suggestions may not be what many experienced sailors would regard as the 'best' method, however in my view they are the most appropriate for our specific scenario. We also avoid special gadgets and only use gear any boat is likely to have on board.

Worldwide support

A great many organisations and individuals have contributed to this article. MOB rescue is a highly emotive subject and many people have very strong views about what should or should not be done and yet everyone has been willing to share their (often harrowing) experiences for the benefit of sailors everywhere.

Some countries prefer the term PIW (Person In the Water), but as MOB is more common in the

UK and is perfectly appropriate for the incident we're covering. I hope our colleagues across the pond won't object if I use 'MOB'. I'll also refer to the single person left on board as 'the crew'.

The information and suggestions in this article are a distillation of our own trials, the experiences of others who contributed and well over a hundred real life MOB incidents.

The conditions

To add realism, on the first day of trials it was blowing F8-9 with the odd gust of 50kn (F10) (Fig 1). Fortunately, on the second day, the weather was much kinder (F3-4).

Thanks to the number of people who have contributed to this article, I believe the proposed procedures to be the most effective for our particular scenario. Having said that, no one would be more pleased than me to receive an email saying: "My wife and I have tried what you said, but find this alternative works better for us". The only thing that matters is that people give this subject the attention it deserves and actively try out some of these ideas, along with any others that appeal, and see what works for them.

Fundamentally, this is a 'try this' rather than a 'do this' article.

The Trials

The trials were conducted with the support and assistance of the RNLI in the form of Keith Colwell, their Divisional Sea Safety Manager and author of the RYA publication *Sea Survival Handbook*. We were also very fortunate to have Dr Frank Golden, a world authority on sea survival and author of *Essentials of Sea Survival* guiding our activities. Most importantly, we had Pat Morrison, my 'wife' for the trials, taking on the role of the person left on board. The trials took place in the Solent over two days. The boat was a Beneteau Oceanis 43 and in addition we had a safety/photography RIB in attendance at all times. I wore a dry suit and a lifejacket, but I include statistics that apply to a person wearing normal clothing.

Don't Panic!

Aficionados of the *Hitchhiker's Guide to the Galaxy* will

appreciate why I have 'Don't Panic' in big letters on my Grab Bag. Panicking has never been known to help a situation and so is best avoided. The trouble is that that's a lot easier said than done.

How do you think you would react to a life threatening situation? Would you be calm and tackle the problem in a logical way or do you expect that you would be stunned into inactivity or, worse still, go into a blind panic and start screaming and jumping around?

I expect most of you would be like me and be pretty confident that you would remain calm and take control of the situation. Unfortunately, the statistics don't support such optimism. In his book *Survival Psychology*, Dr John Leach reports that there's well documented evidence that in a disaster situation only 10 per cent of people will remain calm and focus on the problem, while about 75 per cent of people will be stunned, bewildered and carry on doing more or less what they've been doing and effectively ignore the fact that anything has gone wrong at all. Another 10-15 per cent of people will be at the bottom end of the personal effectiveness scale showing completely inappropriate behavior such as panic, weeping, screaming, laughter and acute hyperactivity.

Millions of years of evolution have programmed us with physiological reactions over which we have little control and our brains are computers that can become overloaded under stress. When they 'crash' they are as useless to us as our home PC.

Fortunately it's possible to dramatically improve your chances of staying calm and focused on the problem in hand by practising MOB rescue – and the main aim of this article is to encourage people to do just that. Reading about it is better than nothing, but actually doing it, and doing it regularly, is considerably more valuable.

Our brains learn from our experiences and if we practise something often enough it becomes routine to the point that we can do something 'without thinking about it'. By training our brain, we give it the chance to pre-plan our actions and avoid being overloaded by

emergency situations.

In correspondence with me, John Leach has also been keen to emphasise that about 80 per cent of a successful rescue is down to the victim, not the rescuer. I've taken this insightful statement to heart and we will cover the great many things that the MOB can do to help themselves and the person left on board. This must be good news for the 'wife' – she needs all the help she can get.

Let's now work our way through an MOB incident and discuss what happens to whom and why, also the steps that can be taken to maximize our chances of a successful outcome.

Hitting the water

When you first hit the water what happens depends partly on water temperature. If it's colder than 15°C then a cold shock response is triggered that causes breathing and cardiac difficulties.

Under normal circumstances in air we can hold our breath for about a minute, but this may drop to less than 10 seconds on immersion in cold water. This reduction in breath-hold time is considered to be one of the single most important factors leading to drowning.

When breath-holding can no longer be maintained, there follows an initial big gasp followed by rapid breathing that causes a ten-fold increase in the volume of air entering and

leaving the lungs. This can cause dizziness and confusion and the sensation of suffocation that aggravates any feelings of alarm.

If a person inhales 1.5 litres of seawater into their lungs they are unlikely to survive; even much smaller quantities can cause lung failure and result, some hours later, in death from what's known as 'secondary drowning'.

Because the body is submerged, hydrostatic pressure adds to our difficulties by compressing the lungs, decreasing their volume and making it harder to breathe. At the same time, this same hydrostatic pressure causes blood to be squeezed out of the lower parts of the body towards the central circulation system and as a result the blood pressure increases and the heart pumps up to 66 per cent more blood. This can cause cardiac arrest and is especially a concern for those with high blood pressure.

For this reason it's a good idea to try to adopt a horizontal posture rather than, for example, treading water, because this minimises hydrostatic pressure and the associated adverse effects, also keeping the body in the slightly warmer surface layer of seawater.

Fit not fat

What can we do to maximise our chances of surviving the initial submersion? One »



Fig 1 The conditions on the first day. (Before we decided to seek shelter.)



might think that a good layer of body fat would help, however the cold nerve sensors are in the outer layer of skin, outside the insulating fat beneath the skin and therefore will not be protected from cold-shock. So a generously proportioned person will feel the cold just as quickly as a thin person. In addition, in practice, such people are unlikely to be very fit and this also increases the magnitude of the cold-shock response – so it turns out you're better off being fit than fat.

Although we're born pre-programmed with these automated responses, there are things we can do to mitigate them and one that's very significant is known as habituation. It's been shown that as few as five two-minute immersions in cold water, on successive days, can reduce the cold-shock response by 50 per cent and may last for up to a year following the voluntary exposure, so we should never turn down an opportunity to spend a few minutes in the health club cold plunge pool.

Heat conservation

If you do survive the initial immersion what should you do?

If you do experience cold-shock, give yourself a minute or so to stabilise before attempting any activities. Try to relax by floating on your back or by

grasping a flotation device that might have been thrown to you. The cold-shock response normally fades after a minute or two and ceases after five.

If there are things you need to do that require manual dexterity you'll need to do them before the cold makes it impossible for you to use your hands – which can happen in 10 minutes or less.

If the water is cold it's essential to reduce heat loss, so don't start swimming, other than to a nearby flotation device, because this increases water flow over the body, which accelerates cooling. I did try swimming and found it impossible to make any headway against the wind. The combination of an inflated lifejacket and cumbersome clothing meant I failed to reach buoyancy aids that were just 2m away. It was also exhausting.

Most sailing wet weather gear includes Velcro straps around the neck, hands and ankles. If they can be tightened they should help reduce the influx and exchange of cold water and may help trap additional air pockets that will assist buoyancy and heat conservation.

Some authorities recommend adopting the foetal or Heat Escape Lessening Posture (HELP) with the legs crossed and knees pulled up towards the chest and arms held close to the body. This may well help preserve heat, but in practice is a

very difficult posture to maintain in all but the calmest conditions.

Spray avoidance

It's essential to avoid swallowing or, even worse, inhaling seawater. The best way of doing this is to keep your back to the waves, so that the waves and spray blow past your face rather than into it. Spray hoods that are an integral part of the lifejacket (Fig 2) are also a great help, because they protect the face from spray, keep the airways clear and allow you to look all around you and hopefully towards the boat that is coming back to rescue you. A good spray hood (as on my lifejacket) should include ventilation holes that help breathing and prevent the hood from misting over too much.

A conscious MOB wearing a lifejacket will find it relatively easy to keep his back to the wind by paddling with his arms and so the spray hood is not so important in these cases; at least not initially.

An unconscious MOB wearing a lifejacket will be turned so that he faces the waves. His head and the lifejacket get blown along by the wind with the legs being dragged along behind. This makes it imperative that he has a spray hood deployed. The only trouble with this is that there's no such thing as an automatic spray hood and so the MOB has to be conscious to deploy it.

This underlines the importance of deploying your spray hood and securing it while you are still conscious.

During our trials I found it quite easy to paddle with my arms and keep my back to the wind and waves and I actually felt quite cosy and secure with the bladders behind and around my head creating a zone of comparative shelter. According to our masthead anemometer the wind was blowing at up to 50kn, but down at sea level it felt a lot less. I found the spray hood on my lifejacket to be easy to deploy and its elasticated lower edge could envelope the inflated bladders and remain reasonably secure. It also allowed good vision through it and added to the feeling of security.

As an experiment I did try facing the waves and spray without the spray hood and can't recommend it. I was fully conscious, warm and, thanks to our safety boat, not in any danger, but I still found myself swallowing a few mouthfuls of water.

Weight of clothing

One common misconception is that saturated clothing 'pulls you under'. On initial immersion clothing is full of trapped air, but over time this leaks out and it is this leakage that gives the impression of your becoming heavier. All clothing should be retained to reduce heat loss by

providing a barrier of relatively static warmer water in the inner layer of clothing.

In the reports I received there were numerous cases where surviving MOB's had reported great difficulty in removing boots that were pulling them under. I've tested this with my own Dubarry ones and found that, far from pulling you down, they actually float; in fact the pair contributed about 0.6kg of positive buoyancy, even after becoming totally saturated with water. I also tried this with the heaviest set of rubber wellington boots that I could find, which did sink with a weight in water of 0.3kg per boot. So test your own footwear for buoyancy.

Staying afloat

A typical lifejacket will have 150 Newtons of buoyancy. This means it can support about 15kg – so how can it manage to keep an adult afloat? The answer is that the weight of a typical adult fully submerged in water and without air in the lungs is about 5kg and, if you add to this the weight of the head (5kg), which is held above water, the total weight that the lifejacket needs to support is just 10kg, so 15kg buoyancy sensibly includes a bit of a safety margin.

Assuming you're wearing a lifejacket when you fall in, don't wait for it to inflate automatically. All lifejackets are designed for manual inflation with the automatic bit being an optional extra. Do you know what to pull on your own lifejacket? Can you find it in the dark or when the pull-cord is under water? Every time you

put on your lifejacket it's a good idea to make sure you can find it. Reinforcement learning helps make actions automatic.

Lifejackets are designed to keep the mouth clear of the water and they will only do this if they are correctly fitted. Having ensured that your lifejacket is fully inflated (firm) check that the crotch strap is secured and fully tightened. This is essential to maximize the protection afforded by the lifejacket to prevent drowning sometime later when consciousness declines with the onset of hypothermia. Without a crotch strap, in the open sea, the lifejacket will progressively ride up the torso and eventually, as consciousness wanes, will slip over the head leaving the unconscious wearer hanging from the arm apertures with the face submerged. It takes little imagination to consider your chances if you do fall in without a lifejacket.

Try to avoid raising your arms to wave for attention, because this can cause further air to escape from your clothing and also means that the weight of your arm above the water will push your head lower, which again increases the chance of water intake.

Safety lines

Safety lines are primarily intended to stop crew falling overboard, but also to keep them in contact with the boat if they do. They are typically 1.5m long and are clipped to the lifejacket harness and also round some structure on deck. With care they can do a good job and »



Fig 2 It's vital to avoid swallowing water. The spray hood is an integral part of this particular lifejacket and is easy to deploy

BEING SEEN & HEARD

It may seem too obvious to be worth mentioning, but try to shout loudly when you fall in. The crew may be below decks and may not have seen you go over the side.



Fig 3 A day/night waterproof flare like this can help your crew, or the rescue services, find you. (RNLI)

With luck, the well equipped MOB will be carrying a combination day/night flare (orange smoke + red flare) (Figure 3) attached to his lifejacket, but these are quite short lived, lasting only about 20 seconds, so they need to be kept for use when they will do some good, rather than just let off for the sake of it.



Fig 4 A whistle can help attract attention – if you're close.

Lifejackets should come equipped with a whistle. In our trials (Figure 4) we found out that the crew in the boat could hear my whistle up to 100m downwind, but only about 50m when upwind (F8-9). A very low cost upgrade is to replace the whistle that comes with your lifejacket with a 'Storm Whistle', which is twice as loud and costs about £7 (Amazon). Blowing a whistle is far more effective and much less tiring than shouting.

Fortunately, technology can give us some additional assistance and I would also recommend that everyone has a waterproof VHF permanently with them. We all seem to manage to carry mobile phones and a small, waterproof VHF is only a bit larger. The cost is not unreasonable and the potential benefits are immense.

It's much easier for the MOB to see the boat than for the boat to see the MOB – so it makes sense for the MOB to be able to take an active role in his own rescue by giving directions to the crew such as 'turn right' (Figure 5). Of course this relies on the boat monitoring Channel 16, but this is only what



Fig 5 A waterproof VHF enables the MOB to call a Mayday and talk to his crew.

we should be doing anyway. In addition, the MOB can send his own Mayday, which further reduces the reliance on the crew's actions.

If the MOB is to be guiding the crew on the boat, then it's clearly important that they also have a VHF in the cockpit. This will happen automatically if everyone always carries a waterproof VHF and knows how to use it. It is also very useful to have a DSC VHF (or its command microphone) permanently available in the cockpit, because this enables all of the above and allows the crew to send a Mayday without taking their eyes off the MOB.

A wrist lanyard on the VHF reduces the chances of its being lost and allows hands to be used for other activities. Also, LED torches are now very powerful and available in waterproof versions. An MOB with one of these to point at the boat will be much more visible at night than if he relies on a conventional lifejacket light.

HYPOTHERMIA

Hypothermia gets a bad press and justifiably so, but it often gets blamed for deaths from other causes, such as drowning or near-drowning or cardiac arrest. Hypothermia is precisely defined and occurs when deep body temperature falls below 35°C. Normal body temperature is 36.8°C and so a margin of less than 2°C is all that separates us from the effects of hypothermia.

Hypothermia is not just a problem in very cold waters, even water as warm as 28°C (Caribbean sea in summer) will eventually lead to hypothermia as the highly thermally conductive seawater drains the body of heat.

The rate of heat loss in seawater is typically 24 times greater than in air at the same temperature and it is this that creates the problem, because the body's thermal control system is unable to keep pace with the rapid loss of heat.

Fortunately, hypothermia is unlikely to be a problem for at least 30 minutes – even in water as cold as 5°C – but once it does occur, the MOB will be unlikely to be able to assist in his own recovery, because his muscles become inoperative.

The critical time for anyone immersed in cold water is when the muscles and nerves of their limbs become so cold that any activity at all becomes increasingly more difficult.

This is usually the case on or about the time of the onset of general hypothermia and long before loss of consciousness, which occurs at a deep body temperature of about 30°C.

This reduction in muscle capability is therefore the stage when the unsupported MOB will

begin to drown. An MOB with an effective lifejacket with crotch strap and spray hood can last appreciably longer.

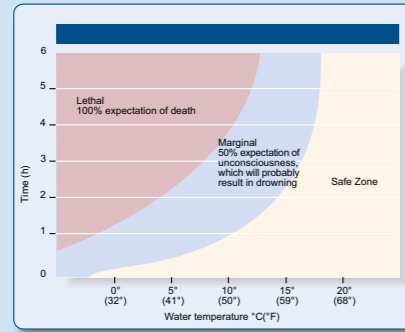


Fig 6
The Barnett survival curve makes grim viewing.

After about one hour in water at 5°C, two hours at 10°C and 3-6 hours at 15°C, a normal adult will have lost 2°C and therefore be entering the zone where useful function has declined and drowning may occur.

These times are reduced significantly if the head is partially submerged or there is inadequate thermal insulation.

The Barnett survival curve (Figure 6) makes grim viewing. If you fall into the Solent in February (6.4°C), sea state permitting, you should last for at least 30-60 minutes, but from then on the odds begin to stack against you until after three hours your chances of survival are almost zero.

These times can be significantly increased when the correct clothing and flotation aids are worn, but even in August when we did our trials and the water was a comparatively balmy 17°C, you are only 'safe' for about three hours.

Table A gives the warmest and coldest temperatures for seas in the northern hemisphere.

| | Minimum | Maximum |
|--------------------------------|------------------|----------------|
| Solent | 6.4°C, February | 19.6°C, August |
| North Sea (Scarborough) | 5.3°C, February | 13.8°C, August |
| Irish Sea (Isle of Man) | 7.3°C, February | 14.2°C, August |
| Orkneys | 6°C, February | 12°C, August |
| Baltic (Stockholm) | -1°C, February | 15°C, August |
| Mediterranean (Ionian) | 16°C, February | 27°C, August |
| Caribbean | 25.5°C, February | 28°C, August |

Table A Showing average minimum and maximum sea temperatures in the northern hemisphere.



Fig 7
A safety line can leave you suspended – neither in the water nor out of it

provided that you fall inboard they should keep you out of the water. However, a problem occurs if people fall overboard while their safety line is still attached to the boat, perhaps to a jackstay. Depending on the size of boat, the MOB may not even reach the water or, if they do, they will be dragged along at speed and probably with little opportunity to help themselves. If this happens on a motor boat it could be fatal and for this reason safety lines are often not advised for use on motor boats.

We tested this out on our 13m (43ft) boat with the safety line clipped to the jackstay and I just about reached the water, but was left awkwardly suspended and would have had a very rough ride in heavy seas (Fig 7). One option in this circumstance is for the MOB to cut the safety line webbing, so he falls into the sea, and in fact my lifejacket (Spinlock Deckvest) came with a special knife just for this purpose. However at this stage the MOB is still attached to the boat, so it makes sense to attach another line to the MOB before cutting or unclipping the safety line.

To aid clarity I will first briefly outline the manoeuvre (Fig 8 A&B), then discuss the various stages in more detail. One danger is that the crew will turn the wrong way and gybe the boat. An uncontrolled gybe can be dangerous, because the boom and mainsheet whip across the cockpit. Even if the crew don't actually get hurt, the violence of the event will further undermine shattered nerves. If determining wind direction is considered too demanding, then

Back on the boat

We will now switch our attention from the MOB back to our 'wife' left alone onboard. What should she do? Top of the list is 'don't make things worse' – they are

quite bad enough already and the last thing you need is for the crew to disable the boat or themselves.

First priority has to be not losing sight of the MOB and this means staying quite close to them by stopping the boat. This is best achieved by turning the boat towards the wind until it is head to wind. This is often referred to as the Quick Stop method.

The following suggested sequence is largely identical to manoeuvres proposed by the ISAF, RNLI and OCC, however I include putting the boat 'in irons' because I believe this is most appropriate for our specific scenario. I assume that the boat has an engine and that it works, because this should be the case in the vast majority of MOB incidents. If it doesn't, then the crew will just have to do the best they can and hope they can get the boat back close enough to the MOB.

To aid clarity I will first briefly outline the manoeuvre (Fig 8 A&B), then discuss the various stages in more detail.

One danger is that the crew will turn the wrong way and gybe the boat. An uncontrolled gybe can be dangerous, because the boom and mainsheet whip across the cockpit. Even if the crew don't actually get hurt, the violence of the event will further undermine shattered nerves. If determining wind direction is considered too demanding, then

(preferably) on the centreline. Pulling in the mainsheet is done early, because it stops the boom swinging around and possibly injuring the crew.

I leave the main up, partly because it would take extra time to get it down and partly to save making an additional demand on our novice crew, but mainly I leave it up because it will serve to steady the boat's movement and assist in controlling her later on. Also, leaving the main up helps counteract bow windage, which on modern boats will set them running downwind at a good rate of knots.

If the main has had a preventer rigged (a very sensible precaution when on a run) then this must be released. A preventer should always be able to be released quickly in the event of a broach and so the preventer line should be to hand in the cockpit.

When exactly to call a Mayday is impossible to give definitive guidance on. If at this stage the MOB is not in sight, then I would certainly call a Mayday straight away. However, if the MOB is in sight then I might give priority to getting back closer to them. It also very much depends on how well prepared the boat and the crew are for calling a Mayday. These issues are discussed in detail later in this article under 'Calling a Mayday'.

Now is also a good time to

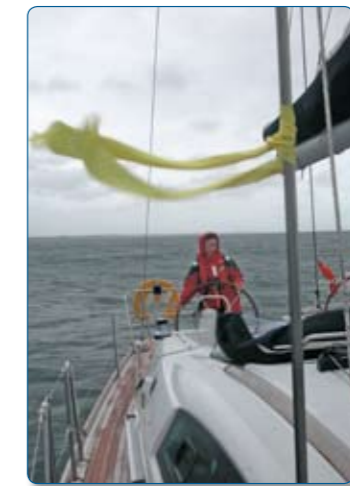


Fig 9
A ribbon in the shrouds helps you judge wind direction.

throw the MOB a horseshoe lifebelt and Danbuoy. This provides extra buoyancy for the MOB and the Danbuoy helps with spotting the MOB during later manoeuvres. There is little point in throwing in the above if by this stage the boat is a long way from the MOB. If they are not close, save the horseshoe and Danbuoy for later.

It is also a good time (in a daylight recovery) to throw in a buoyant smoke if one is to hand. These last about three minutes and will help mark the position as well as raising an alarm with any other boats that are in the vicinity.

If the MOB is within throwing distance of the boat, you can proceed straight to '(5)'

– there is no need to go on a full circuit if you can take a short cut.

We also experimented with fluorescent dyes (Fig 11) to see if they helped mark an area of water and make it easier to locate the MOB from the boat and/or rescue helicopter. These are still under development, but do show significant promise.

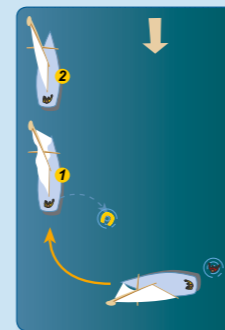
Put her in irons

For the next stage, we are effectively putting the boat 'in irons'. I am sure that most of us will have been in this situation a few times while attempting to tack and will know that it can be quite difficult to get out of – especially without a



Fig 10
Helmsman's eye view. The boom points the way to go when turning into the wind.

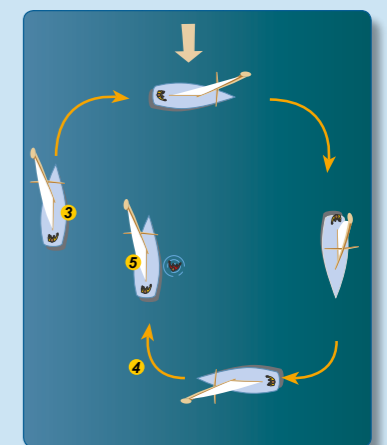
Fig 8A Stop the boat, tame the sails and call for help



- 1) Immediately** turn the boat head to wind
- Throw** in flotation/Danbuoy
- Centre** the wheel/tiller
- 2) Sheet** main in tight
- Call** Mayday
- Roll** away/drop headsail
- Prepare** recovery sling
- Check** no lines in the water
- Switch** on engine



Fig 8B Under power, get downwind of the MOB and return head to wind



- 3) Under** engine, motor back to downwind of MOB
- 4) Approach** MOB head to wind
- Stop** with MOB abeam and 5-10ft from boat
- Put** engine in neutral
- Centre** the wheel/tiller
- 5) Throw** recovery sling
- 6) Pull** MOB to boat near the shrouds

Immediately turn head to wind

I suggest coming head to wind as this is the quickest way to stop a boat and also makes pulling in or furling the headsail possible.

Most inexperienced sailors – and even quite a few experienced ones – have difficulty sensing the direction the wind is blowing from – I know I do.

My instinctive reaction is to look up to the windvane at the top of the mast, but this risks losing sight of the MOB. For a novice, the

windvane and 'V' can be confusing and electronic cockpit displays are no better. In our particular trials we tied yellow ribbon to the shrouds (Fig 9) and some people might find this a more intuitive way of judging wind direction. Lengths of wool or a spare burgee may work even better.



Fig 11 Fluorescent dyes can help mark an area of water

headsail to back. We can use this characteristic to our advantage in the MOB exercise. Heaving to is another option that works well, but for our inexperienced crew I favour the 'in irons' approach and the added safety that a centred main and a rolled away headsail provides.

To put the boat 'in irons' we first centre the wheel/tiller and if necessary lock it in that position. Then the headsail sheets can be released and the sail roller-furled away or dropped. The boat is then weather-vaned by the main and should stay pretty much head to wind. On some boats the wheel/tiller can be left to move freely, while others really do need it to be secured in a centred position. Depending on your boat you may find she sits perfectly happily like this or you may find she has a tendency to go through the wind and tack slowly from one side to the other. Some boats may make headway towards the wind while others will drift backwards. On quite a few modern boats you may find the bows get blown off, in which case try applying a bit of corrective rudder and see if she stabilizes OK. Whatever it does it is unlikely to do anything quickly, which is the main point of the exercise. Boats don't come with handbrakes, so it is a matter of experimenting on your own boat and find out what works. The end result we're looking for is for the boat to be more or less stationary in the water so we buy ourselves time to catch our breath. One thing we do not need to worry about is the tide, because both the boat and the MOB are in the same water, so the effects of tide can effectively be ignored.

I furl the headsail to get it out of the way. Many people say you should just let the headsail sheets fly free so the sail is depowered, but in my experience this can be a hazardous tactic. In any kind of

a wind the loose sheets and the clew of the headsail will crack around like whips and would be extremely dangerous for anyone moving forward of the cockpit, which is something you will have to do later on in the exercise. Also, in my experience, loosely flogging sheets very soon find something to catch on and when they do the sail will fill and hamper any manoeuvres. They also risk stopper knots coming undone and sheets getting in the water and fouling the prop. Much better, in my view, to take the short time that is necessary to furl the sail.

Rolling up the headsail also greatly improves visibility while looking forward, which gives the crew a much better chance of seeing the MOB and a reduced chance of running them over. In addition to the practical benefits of the above it also has a deep psychological impact. At this stage the crew will be very highly stressed – the last thing they need is the added anxiety that the noise and wild movements that flapping sails would create.

Return to the MOB

With the main still up, but secured, the engine can be switched on (after checking for lines overboard) and the boat can be motored back towards the MOB. If the MOB is downwind of the boat it's best to continue past them and then approach into the wind while travelling quite slowly. During the turns, the boat will heel over as the pinned in main gets the full sideways force of the wind and steering will be quite hard work, but at least the boom has been secured to stop it whacking across and the turn will soon be completed and normal angles resumed – so don't panic.

In the next stage the aim is to get the boat back close to



Fig 12 The recovery sling can be thrown directly to the MOB

the MOB and to throw him a floating line of some sort.

In our trials we used a KIM MOB Sling, which consists of a floating sling that is attached to the boat by (typically) 30-45m of yellow floating line. The idea is to both pass the MOB a flotation aid and also to secure them to the boat via the floating line (Fig 12). The MOB can pass the sling over his head and under his arms so that the line can then be used to pull him towards the boat and lift him out of the water. Recovery slings of various designs are quite a popular accessory and ISAF's Offshore Special Regulations require a recovery sling to be carried on all racing boats.

Approach the MOB head to wind, so that he ends up amidships and about 5-10ft from the boat, then put the engine in neutral. Don't try to get too close or you risk running him down. Your aim is to have the boat stationary at this stage and 'in irons', just as when we first went head to wind. Next throw the MOB a recovery sling. While the MOB is getting sorted out with the recovery sling, it makes sense also to throw in a horseshoe lifebuoy and Danbuoy – mainly as a precautionary measure in case the planned recovery has to be aborted for any reason.

When the MOB is in the sling, pull him towards the shrouds. Getting the MOB near the shrouds is important, because that is the area in which he is to be lifted out of the water.

Also, the shrouds give the crew something firm to hang on to, which is no bad thing.

Some sources advocate throwing the sling into the water and then steering the boat in tight circles around the MOB so that the sling or its attached floating line comes within reach of the MOB (Figs 13 A&B). We tried this, but found that, because our turning circle was quite large, the sling just followed the boat around in circles and it took several complete circuits before the sling came remotely close to me.

I've since learned that the length of line should be 3 to 4 times the length of the boat. Our boat was 13m long and so the 30m line on the recovery sling we used was simply too short with the result that the sling followed directly behind the boat, much as would a dinghy on a long painter.

I actually prefer to get close to the MOB and then just throw them the sling, but the tow astern method does have a lot of advocates and I am told it works well if practiced sufficiently.

The MOB should waste no time in getting the recovery sling over his shoulders and under his arms. Once fitted like this the MOB can still be recovered even if he subsequently loses consciousness. The MOB should try to ensure that he is on his back when he is pulled towards the boat, because this helps to keep his face away from spray and seawater.

It's also a good idea to tie in a series of loops (as shown) about every foot or so in the final two or three metres of the recovery sling line or, for that matter, any line that is used for MOB recovery, because they give both the MOB and the crew something to get a grip on to aid in pulling him to safety.

A bare line of 10mm diameter or less is really difficult to grasp without them.

Some recovery slings are designed to inflate automatically when they hit the water. The pouches that they are packed in also make them easier to throw a good distance (e.g. up to 30m). The difficulty with these is that if the first throw is not successful they are then so light that it is very hard to throw them any distance on the second attempt.

Engine On?

The question of whether you should put an engine in neutral or switch it off altogether is a difficult one that varies from boat to boat. The danger of being in neutral is that it is all too easy, in the heat of the moment, for the throttle/gear lever to be knocked or pulled or caught on a line and for the propeller to start turning; I've even known one boat where a maladjusted control cable meant the propeller kept turning slowly even when the throttle lever was in neutral.

On balance, provided I had a reliable engine and an easy way of stopping and starting it from the cockpit, I would favour switching the engine off.

Is the MOB conscious?

The above assumes that the MOB is conscious and still able to assist in his own recovery. With luck this will be the case in the majority of incidents.



Fig 13A The boat circles to draw the recovery sling line close to the MOB

We did try recovering both me pretending to be unconscious and an RNLI mannequin.

We tried lassoing in the same way that you might lasso a buoy. First we tried with a length of line tied in a big bowline and the bitter end secured round a cleat. We struggled with this and needed several attempts (Fig 15). The main problem lay in finding which bits of line to gather in your hands ready for the big throw. Also, it does require that the crew can tie a big bowline under stress and for this reason



Fig 13B The crew hauls in the MOB

alone I would rule it out from our scenario.

We got on much better without the

bowline and with both ends of the line secured to a cleat. With the line gathered up in loops, half in one hand and half in the other, we then cast both halves together forming as big a circle as possible as it hits the water with the MOB in the centre. This worked first time – even when I was pretending to be unconscious. I was then secured to the boat with the line going under my armpits. It even worked with the RNLI dummy and meant that the MOB was then secured to the boat, which

is always an important first stage. Progressing to recovery of the unconscious MOB proved very difficult indeed, as we will show next month.

My final conclusion for our scenario is that if the casualty is unconscious, the most important thing is that the crew send out a Mayday at the earliest possible opportunity and also that they stay close to the MOB.

After this, if they can lasso the MOB then that's a definite bonus, but thereafter they are much more useful being available to talk with the rescue services than they are attempting other activities such as the liferaft recovery method, which they probably have little chance of successfully pulling off. »

ALTERNATIVE APPROACHES

Lots of people may not agree with any or all of what I've described, so I would now like to explain my reasoning. Quite a few alternative methods involve travelling some distance away from the MOB, primarily to allow room for the manoeuvres that follow. My main objection is that moving further

away risks losing visual contact with the MOB. This is especially true at night and when only one person is left on board. Also, any change to the boat's heading can easily lead to disorientation, which again makes it all too easy to lose visual contact, so in my view, you need to stay close so that even

if you do have to take your eye off the MOB you have a fighting chance of being able to find him again. An alternative method for staying close to the casualty when he first goes in is to simply push the helm hard over and leave it there (*Handling Emergencies*, John Goode). The main and the headsail are pulled tight when head to wind and the boat will simply go round in tight, but graceful circles and stay close to the MOB. This is a very calming manoeuvre and buys time.

Many experienced sailors favour getting the boat beam on to the wind and upwind of the MOB and letting it drift down onto the MOB. This works well and the tilting over by the wind has the

advantage of reducing the height of the deck above the water, so it should be easier to recover the MOB. Also, the MOB is sheltered by the boat herself. Unfortunately, this is quite a tricky manoeuvre as it requires fine judgment and throttle control. This works, because the boat will be blown downwind faster than the MOB. However, there's a danger of the MOB being swept under the boat, particularly in strong winds and on boats with high windage, but is especially a factor if the MOB isn't wearing an inflated lifejacket.

It's also preferable to keep any close quarters manoeuvring under engine to a minimum, due to the risk of a line thrown to the MOB getting caught round the prop or of the MOB finding himself with his feet dangerously near the propeller. (Fig 14).

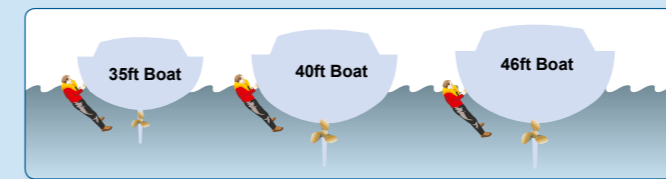
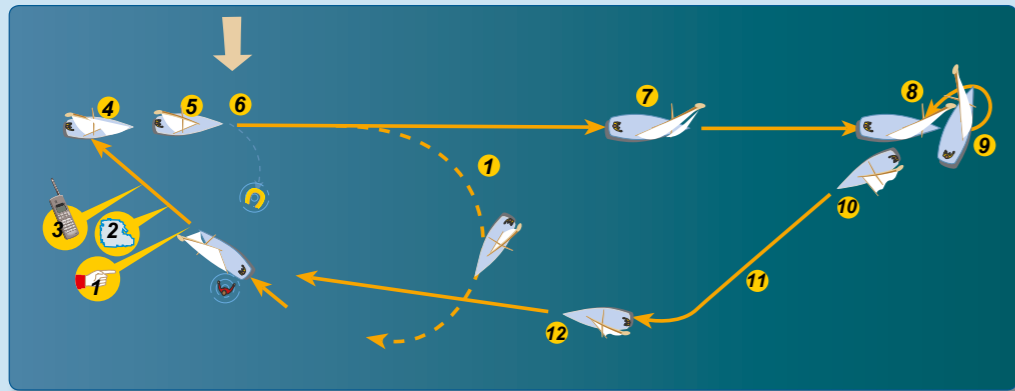


Fig 14 Mind your legs! Our artist's cross sectional view of the boat shows the location of the prop so we can see just how close an MOB's feet are likely to get to the boat's propeller in real life

THERE'S MORE THAN ONE WAY



People have different opinions about the 'best' techniques and we're keen to hear from other readers. This procedure, favoured by James Turner, our Technical Editor, begins the same way, whether you use the sails or the engine. 1. Sail on a bit, getting the boat calmly ready for a tack onto a beam reach. If not sailing upwind, come up onto the wind closehauled until a bit upwind of the MOB. 2. Make a radio call. (Do this early in coastal waters. The CG whirly-bird can be with you in a few minutes in the Solent.) I always keep a h/h VHF in my pocket for this eventuality.

3. If the engine starts, tack, rolling up the jib as you go and complete the circle shown with the main tight in, approaching on a close reach, viewing the MOB through the shrouds; keeping him on a constant bearing on the lee side will result in his arriving at the lee shrouds. 4. If the engine doesn't start, set the boat up on a beam reach. 5. Passing dead upwind of the MOB, launch the recovery gear, to include at least a danbuoy, so you won't lose sight in the next minute. (This will float downwind to the MOB). Call to the MOB to reassure him you're coming back. 6. Continue on a beam

reach about 10 boat lengths then tack, rolling the jib in as you come round, and point at the MOB. 7. Dump the entire mainsheet. From here, power it up by pulling the sheet as one bit of rope, not through the blocks. 8. Aiming at the MOB, if the main is still full of wind dive off downwind to modify the approach angle. Check again, aiming at the MOB. If the main is still full of wind, repeat till you find the angle where you can lose all power by dumping the main. 9. Approach MOB at slowest controllable speed, keeping him on a constant bearing on the lee side. He'll arrive at the lee spreaders.

into was only slightly above freezing point and in such conditions loss of consciousness is usually measured in minutes.

On a happier note, there was a case a few years ago when a man fell overboard while crossing the Atlantic. Many boats were in the vicinity and all tried to find him, but without success. He was eventually rescued 18 hours after falling in. He wasn't wearing a lifejacket, but as the water was warm, hypothermia wasn't an immediate issue. He reported that, on several occasions, boats had sailed past very close to him. This underlines the importance of looking nearby in the water when searching for an MOB and not concentrating solely on the horizon. Also, had he been wearing a lifejacket with a bright orange or yellow bladder and a spray hood, he might have been spotted earlier. As it was, he attributes a lot of his eventual rescue to the waving of his yellow T-shirt.

How much earlier would he have been rescued had he had a VHF in his pocket?

Calling a Mayday

When to call a Mayday is an important consideration. Most of our sailing in the UK is done in sight of land and we are very fortunate indeed to have the excellent services of the RNLI at our disposal. In addition, other boats are likely to be around and may offer assistance. Pressing the red DSC button on your VHF radio and calling a Mayday are enormously important. However, there's a danger of losing sight of the MOB if the crew has to go below, so it is far better to have a waterproof 'command' microphone that includes a DSC button, located in the cockpit

Calling a DSC Mayday typically involves pressing the DSC button on the VHF, then selecting the nature of the distress from a short list of options and then pressing the DSC button again for about five seconds. This sends a digital alarm that includes your GPS location and message to the Coastguard and any DSC capable boats nearby. If the crew is unable to use the VHF, they can still use their mobile phone, coverage permitting, to dial 999 (UK only) or 112 (Europe + UK) and ask for the Coastguard. The calming voice on the other end of



Fig 15 Lassoing the MOB works – but usually takes practice.

the phone should be able to work with them to find out where the boat is and initiate a rescue.

The use of a mobile phone should not be regarded as an alternative to the VHF, because it cannot be heard by other boats in the vicinity and cannot be tracked by Search and Rescue helicopters. However, it is a lot better than nothing and could allow the frightened crew to be talked through other operations such as using the VHF and reading out a GPS position.

There are a few occasions, however, when sending a VHF

Mayday will not be of any use. If you are in the middle of an ocean with no ships within view then it is most unlikely that you will be heard. In this scenario the priority must go to staying in visual contact with the MOB and attempting a rescue.

Every second counts

One skipper told me he only survived because his wife didn't actually use up valuable time calling a Mayday.

The glacial meltwater he fell

Next month: getting the MOB back onboard and how to look after him as he recovers. We also cover the things we can do to prevent the MOB happening in the first place and simple preparations we can make in advance to help us if it does.

In addition, we will include guidance from the RNLI and Coastguard, saying what they do when they arrive on the scene and what things the crew on our boat can do to help them do their job.

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Organisations
Cruising Association (CA), Hallberg-Rassy Owners Association (HROA), HM Coastguard SAR Helicopter Unit, Lee on Solent), Marine Accident Investigation Bureau (MAIB), Maritime and Coastguard Agency (MCA, Southampton), Naval Academy Sailing Squadron, Ocean Cruising Club (OCC), Royal Cruising Club (RCC), Sailing Foundation of Seattle, UK Coastguard and Helicopter Rescue Services, US Sailing, www.noonsite.com.

Individuals
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SailTime (Oceanis 43), Ocean Safety (life saving equipment), Spinlock (lifejacket), Henri-Lloyd and Musto (drysuits), Town End (Dyotix Life dye) and Icom (waterproof VHF).

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M.O.B.

Getting them back on board

Last month **Clive Loughlin** looked at the physiological and psychological impact of falling overboard and described a method that an inexperienced crew might try to get back to the MOB. In this, the second of three articles, he examines how to get them safely out of the water.

All photos Nick Day

If you read my previous article you'll understand where we're coming from. Our scenario is very specific – an experienced skipper and his inexperienced and perhaps unconfident wife go sailing and he falls in leaving her alone on board. What should they do to give her the best chance of saving his life?

The trials were conducted with the support and assistance of the RNLI with Keith Colwell, Divisional Sea Safety Manager and author of the RYA publication *Sea Survival Handbook*, and Dr. Frank Golden, a world authority on sea survival and author of *Essentials of Sea Survival* guiding our activities.

This then is a 'try this' rather than a 'do this' article. The best strategy for an MOB situation will depend on the boat herself and the ability of the crew left on board and the MOB in the water.

The way we were

We finished off with the boat stopped in the water and 'in irons' with the bows pointing more or less into the wind and the MOB roughly amidships and 5-10 ft from the boat. We also managed to get a line to the MOB, so at this stage they are attached to the boat. All of the crew's activities were performed by Pat Morrison on her own. We

did this to ensure that all actions were physically manageable by a lone female.

With the boat head to wind, wave action can work to pitch her around, making the stern and bow a no go zone for the MOB (Figure 1). This is why it's important to use the line to the MOB to pull him towards the beam of the boat to keep him away from this danger. With luck you'll have an amidships cleat that the line can be secured to while you prepare to recover the MOB back on board.

The best method for getting the MOB back on board depends on how much he can help himself and this will be partly determined by the temperature of the water and how long he's been in it, as

well as any injuries he sustained when falling in.

We shall start off from the positive and optimistic position that the MOB is in good shape, in which case there's nothing wrong at all with taking the simplest possible approach.

Boarding Ladders

If conditions are calm and the MOB is able to help himself,



Fig 1 Under the stern of a boat is no place to be in bad weather

ABOUT THE AUTHOR

Clive Loughlin is a chartered engineer and recreational sailor and is also a regular contributor to *Sailing Today*. We would be very pleased to hear from readers to find out how they get on using the methods proposed in this article and any others that they find work better on their particular boats. Clive would also be pleased to hear from ST readers about any technical aspects of sailing or navigation that are of particular interest to them.
Email: clive.loughlin@sailingtoday.co.uk

then there's no reason why he shouldn't use the stern boarding ladder if one is available. There's also a lot to be said for having a boarding ladder amidships.

We tried emergency step ladders of the form that are designed to live in a bag secured to a couple of stanchions with a trailing pull-line so that the MOB in the water can reach up and pull it down. We tried a set with webbing for steps and a set with rigid steps. In both cases they were not long enough to reach the water, let alone drop down to a foot or two below the surface, which is where you need the lower step to end up.

Even after tying on extra lines, so the steps could be lowered to a useful height, I found them both very difficult to use. Those with the webbing steps were virtually impossible to get a foot in. The main problem was caused because with my lifejacket inflated I could see neither my feet nor the steps. The rigid steps were better, but only once I had found my

first foothold. Both sets would probably work fine for occasional use after a cooling dip, but for emergency use I would suggest looking elsewhere for a solution (Figure 2).

The difficulty with the steps was just one of a depressingly large number of cases of equipment that was purchased with safety in mind, not being up to the job. This underlines that safety is not something you can just spend money on and then forget. You really need to try equipment out under reasonably realistic conditions and wearing clothing (including an inflated lifejacket) that could be relevant to your situation, so that you know how to use it and also know how to overcome its shortcomings. Had I bought myself a set of the webbing steps and tested it after a lunchtime dip in the Med, I would probably have decided they worked fine and been happy with my purchase. It was not until they had been tested while wearing an



Fig 2 The emergency boarding ladders were very hard to use.

inflated lifejacket that the major flaws were revealed.

There is a good case to be made for having a set of rigid steps amidships as a permanent feature. These could be telescopic so that they come to the same height as the guardwires when raised, but reach down to below the waterline when deployed. I have not seen such steps on

the market, but telescopic stern boarding ladders could probably be modified for use in this way and would no doubt prove themselves useful for more routine activities.

Launching the liferaft

If the MOB is in good shape, but there is no readily obvious way for him to get out of the water, then one option is to launch the liferaft, leaving its painter attached to the boat. The MOB may then be able to get himself into the liferaft where he will be relatively safe and secure while a method for getting him back on board can be sorted out. It is essential that this be done at the earliest possible opportunity before the MOB succumbs to the cold and exhaustion. Getting into a liferaft is quite difficult in itself, as anyone who has every tried it will testify.

Getting him back

In cold water, when useful action of the hands is quickly lost, the »

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task of self-recovery would verge on being impossible, so it is most likely that assisted rescue will be necessary. This would mean that using a boarding ladder is no longer an option, but with luck the MOB will still be able to offer some assistance to the crew that is working to recover him.

If we return to the stage when we have our MOB alongside amidships and secured to the boat by a recovery line, the next thing we need to do is to try to get him back on board the boat. In my view the best way of doing this is to use a masthead halyard; a spinnaker halyard will normally be available. This needs to be unclipped from wherever it is stowed and lead outside all guardwires and clipped on to either the lifting strop on the MOB recovery sling or directly to the harness loop on the MOB's lifejacket. The MOB should still remain attached to the recovery line even when securely attached to the halyard.

The crew then puts turns around a winch and grinds away to raise the MOB clear of the water and over the guardwires. The winch in question needs to be both available for use (i.e. not still holding the main halyard) and self-tailing. It also needs to be big enough (gear ratio) to provide sufficient gearing for the crew to raise the waterlogged MOB.

If the boat is rolling around there is a danger of the MOB being swung away from or towards the boat as he is lifted higher. This can be controlled by the MOB recovery line that should still be round the MOB.

Some experienced sailors advocate the use of the boom and mainsheet to act as a hoist for getting the MOB back on board. This could work, but in my view it adds extra unnecessary complications and the prospect of the freely swinging boom (even without the main still up) is not one that I find at all attractive.

Others advocate the use of a 4:1 purchase arrangement (often referred to as a handy-billy), which has the top end attached to a masthead halyard and the lower

The MOB recovery sling is used to haul the MOB (face up) back to the boat.



end clipped on to the MOB. The pull line of the handy-billy is then led via a headsail block back to a winch and the winch ground round to raise the casualty. The argument for this is that the 4:1 purchase further supplements the gearing on the winch itself to make the lifting easy. Another argument is that it means that it does not matter if the halyard sheave at the top of the mast should jam.

I have several concerns regarding the use of a handy-billy in our scenario. The first is that it adds unnecessary complications. Before being used, the handy-billy needs to have the upper and lower blocks at least 2m apart to allow for a decent lift. If the handy-billy was left stowed like this then it is not too bad, but if not, then valuable time has to be spent getting the system ready to

use. Also, in my experience, block and tackle arrangements have an uncanny ability to tie themselves in knots that take quite a bit of untangling. Of course you could have one all ready to use and stowed accordingly, but in practice it would probably end up getting buried in a cockpit locker. A good alternative would be to have the handy-billy stowed at the mast and ready for the halyard to be attached.

I also do not consider the risk of the masthead halyard jamming to be a significant one. I have checked with rigging specialists and they have all stated that the masthead sheaves are built to withstand far greater loads. I have known thinner wire halyards jump off the sheave and jam when pulled sideways, as will be the case if the line is used as I propose, but wire halyards are hardly used anymore since the development of low stretch synthetic lines.

There are, however, two things that can thwart the proposed method. The first is that the masthead halyard needs to be long enough to reach the water. If yours doesn't,

I would advise replacing it with one that does. The second is that the crew's job will be made a lot easier if the winch is self-tailing – if it is not she will struggle and may well find the task impossible.

Pat had no difficulty lifting me up using the spinnaker halyard and the coachroof mounted winch (size #40, 40:1 gearing). We did also try out a 4:1 handy-billy, but any mechanical assistance it did give was mitigated by needing four times as many turns of the winch handle to achieve the same amount of lift. This made raising me tediously slow and once we had tried using the spinnaker halyard directly we never went back to the handy-billy.

Pat was unable to lift me using a 4:1 handy-billy on its own. A 6:1 just about made it possible for her to lift me, but this was under ideal conditions and so I doubt it would have been viable in a real emergency.

I have subsequently done tests with other female crew using a masthead halyard on its own (no handy-billy). This proved impossible with a #6 winch and was difficult but possibly manageable with a #16 winch, while



Jimmy Green's 4:1 Handy Billy



Fig 3 An MOB recovery sling is also used for lifting the MOB back on deck.

RECOVERING THE MOB...

In the course of our trials we tried many of the 'approved' methods for raising the MOB out of the water. I will cover each of these in turn to report our findings.

The use of a sling is quite a popular method (e.g. Kim MOB Sling by Ocean Safety and the US company Lifesling). For those not familiar with them, these comprise a 'U' shaped collar section of buoyant foam secured to a floating line that is typically 30-45m long and with the other end permanently attached to the boat. The MOB puts the collar over his head and under both arms. (Figure 3)

When the MOB is secured in the sling the crew can pull him towards the boat. Once alongside, the masthead halyard can be clipped to the lifting strop on the sling. At first I made the mistake of trying to hold onto the lifting lines as I was being pulled up; this was hard work. The correct way to be lifted is just to let your arms hang down loosely.

An inflatable Jonbuoy is an alternative to the MOB recovery sling. This can be



Fig 4 A Jonbuoy provides a raft for the MOB and helps ensure a horizontal lift.

rapidly deployed from the transom and it automatically inflates to create a miniature raft into which the MOB can drag himself. The whole assembly can then be lifted up using a masthead halyard and this has the benefit of the MOB being relatively horizontal. (Figure 4)

Another method we

tried is sometimes referred to as the elevator method. This uses a mooring line running from a forward cleat and then dropping down into the water with the other end going via a block back to a winch. The idea is that the MOB stands on this line and is raised up as the mooring line is winched tight. This method does not use the masthead halyard to raise the MOB – all the lifting is done indirectly by tightening the for and aft mooring line. For this to work at all, the MOB either needs to be able to grab the toerail from the water or, if the decks are too high, as they were in our case, to grab onto a line that has been let down to him. This line needs to have knots in it at least every foot or so. An unknotted line is simply too difficult to hold onto and to pull



Fig 5 (above right) The elevator method takes some practice – and it hurts.

Fig 6 The trapeze gives a comfortable lift that is very easy on the MOB.



a #43 two speed winch was easy when on the second gear with 43:1 power ratio, but the first gear with a 14:1 ratio proved unmanageable. Incidentally, the first gear of most two-speed winches is often 14:1 or less, regardless of the size of the winch.

These tests show that you need to have a winch of at least size #30 if you are going to use it for raising an MOB out of the water. It is also probably essential that it be self-tailing.

If your winches are less than size #30 then you will need to use whatever you do have in combination with a handy-billy (see Product Supplies).

There is an apocryphal line of thought that basically says 'Don't worry – in a moment of crisis you will find the strength to do...'. There are physiological reasons why this may have an element of truth, but it is not something that can be relied on. If you cannot do something under controlled conditions on a warm day, then it is folly to assume you will be able to do it after a tiring sail in awful conditions and under considerable stress.

How to recover an unconscious MOB

The recovery of a conscious MOB, who is able to assist in his own rescue, is difficult enough, but how on earth do you manage if they are unconscious or injured? Last month we »

yourself up with. (Figure 5)

I found this very difficult to do. One problem is that you need to set your feet securely on the mooring line and keep them there. This is really quite tricky, because everything is moving around all over the place. Then you need to adopt the correct stance, so that you are balanced on the mooring line. If you don't, you simply fall away from the boat. Even while grasping the knotted lift line I found I was unable to hold myself. However, after about four attempts and with expert guidance, I developed the knack and then it worked reasonably well. It was, however, incredibly painful for my feet, which were crushed with some considerable force against the side of the boat as the line was tightened.

It might seem reasonable to adopt the view 'never mind »

...RECOVERING THE MOB

the pain – if it works then use it'. However, it is important to remember that the MOB is likely to be pretty exhausted at this stage and anything that involves pain normally also means that it requires some strength to make it work. I was wearing a drysuit, was never in any danger and was never cold – but there still came a time in the recovery exercises when I was completely exhausted and simply too weak to help myself and had to rely entirely on Pat to get me back on board.

We then tried a very simple device that I have not seen mentioned elsewhere, but which in my view was one of the great successes of the MOB trials. This device is basically a trapeze. I had first considered its use as a step with the trapeze being lowered into the water and the MOB standing on it while grasping the lifting line. When used in this way it did work, but required some strength. The real advantage came, however, when I sat on the trapeze and was raised up out of the water with hardly any effort at all. (Figure 6)

To make the trapeze, get a length of line about 8mm diameter and about 4.5m long and a 40cm length of the sort of plastic pipe that is commonly used by plumbers for sink waste drains. These are normally either 32mm or 40mm in diameter.

Put one end of the line down the pipe, back round the outside and then back through the pipe again and tie the ends of the line together with a double sheet bend. Now push and pull the line so that you end up with the double sheet bend out of

sight inside the pipe. Then tie a simple overhand knot to create a loop in the middle of the bight of line, such that the trapeze is horizontal when you hold it up by the loop you have just created (Figure 7). Of course, this has to be prepared in advance, but for the outlay of just a few pounds and 15 minutes of your time, you can have a very valuable piece of rescue equipment that will take up minimal space in your cockpit locker.

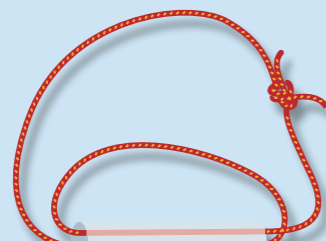


Fig 7
The MOB Trapeze

I have also made arrangements for the trapeze and handy-billy to be available commercially from Jimmy Green (see Product Supplies).

This system has several advantages that are not immediately apparent.

The first is that the pipe holds the loop open, so that it is relatively easy for the MOB to deploy it over himself.

The second is that because when you actually sit on it you're pretty well balanced, not only does it mean that it takes minimal effort to stay there, but it also means that the MOB can easily hold himself with his body and legs horizontal, which will be an enormous help in minimising the chances of cardiac arrest following the hydrostatic pressure release (see panel on opposite page).



WITH THANKS TO SAILTIME

The boat we used was SailTime's *Sailfin of Cowes*, a Beneteau Oceanis 43, one of a selection of 11 boats based at Hamble and Lymington. SailTime is the UK's premier sailing membership company and has five bases along the south and east coasts, with four more due to open throughout spring/summer 2009. Details www.sailtime.co.uk



An MOB rescue sling trailed behind the boat can be brought close to the MOB. Key to the success of this manoeuvre is for the boat to travel slowly, because this reduces the size of her turning circle.

discussed how the MOB can be lassoed to keep him in contact with the boat. If the conditions are not too bad, then it may be possible to drag him to the stern of the boat and, if you have a sugar scoop transom or boarding ladder, hook a masthead halyard onto his lifejacket harness.

An amidships boarding ladder could also be used by the crew to get herself down to water level and within reach of the MOB. I hope it goes without saying that the crew must be wearing a lifejacket and be securely clipped on before venturing outboard.

Many shackles used for attaching halyards to the head of a sail are not at all easy to use, even under normal circumstances when you have two hands available for the task. Clipping these onto a harness that is bobbing about in the water would be almost impossible.

If this is the case on your boat then it might be easier to attach a normal lifejacket safety line to the halyard and then use the other end of the safety line to clip onto the MOB's harness. This also adds a useful 1.5m to the length of the halyard making it more likely to reach the MOB.

Desperate measures

If you can't get a lifting line onto the MOB then desperate measures may be called for. One method we tried was to first lasso the MOB near the stern of the boat, so that they were secure, and then to deploy the boat's liferaft (or an already inflated dinghy could be used instead), being sure that the painter was firmly attached to the boat. Pat then got into the liferaft and struggled to try to pull the mannequin into the liferaft.



Fig 8 Dragging an MOB into a liferaft is very hard work – even under ideal conditions

10 stone and so is at the lighter end of the range of the male population. Also, we were trying this under almost ideal conditions and yet it still proved very hard to do.

It also puts the crew at a considerably greater risk and there are numerous opportunities for disaster to strike and for you to end up with two MOB's instead of just one.

For this reason, and for our particular scenario with just a single inexperienced crew member, I cannot recommend the method. It is simply too risky and the chance of the crew member being able to be of practical help is minimal.

In my view, if the MOB is unconscious, then priority must be given to staying close to the MOB and also, most importantly, being in early contact with the rescue services and for the crew to concentrate on working with them to guide them to the scene and effect a professional rescue.

MOB back on board

Assuming that we now have our MOB safely back on board, we may think that the mission has been accomplished. We have done well, but we are not out of the woods just yet.

Unfortunately, the records are full of cases where the MOB died

With the liferaft fully inflated she did not have a chance, so we tried deflating the upper ring to reduce the freeboard, so she had less lifting to do. This was still very hard work, but at least she was able to get the MOB's head and upper body out of the water (Figure 8).

The RNLI mannequin weighs

sometime after being rescued and, more sadly still, many were completely avoidable.

In next month's feature we will cover the best things that can be done to care for the rescued MOB, as well as things that we can do to prevent the accident happening in the first place.

We will also look at the



preparations we can make in advance to help us if we still get into a man overboard situation.

We will also include contributions from HM Coastguard and the RNLI telling us the things they would like us to do to help them do their job.

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ACKNOWLEDGEMENTS
Organisations
Cruising Association (CA),

Hallberg-Rassy Owners Association (HROA), HM Coastguard SAR Helicopter Unit (Lee-on-Solent), Marine Accident Investigation Branch (MAIB), Maritime and Coastguard Agency (MCA, Southampton), Naval Academy Sailing Squadron, Ocean Cruising Club (OCC), Royal Cruising Club (RCC), Royal Harwich YC (RHYC), Sailing Foundation of Seattle, UK Coastguard and Helicopter Rescue Services, US Sailing, www.noonsite.com

Individuals

Pat Morrison (the 'wife'), Keith Colwell (RNLI), Dr Frank Golden and Prof Michael Tipton (University of Portsmouth), Dr John Leach (Lancaster University), Graeme Johnston (SailTime), Chris Waterman (Ocean Safety), Caryl and Peter Aitchison, Brian Alexander (Tri-Buckle), Jim Baerselman, Nick Barham, Jonno Barrett, David Beckly, Mike Bickell, Chris Brown (RHYC), George Curtis (OCC), Bernard Holland, Eispeth Iskander (RHYC), Ted Laurentius (OCC),

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EQUIPMENT SUPPLIERS

SailTime (Oceanis 43), Ocean Safety (life saving equipment), Spinlock (lifejacket), Henri-Lloyd and Musto (drysuits), Town End (Dyofix Life dye) and Icom (waterproof VHF).

PRODUCT SUPPLIES

The author has no financial interest in the following products:
Coastline Manoverboard Lifting Trapeze, www.jimmygreen.co.uk (£8.50)
Coastline Manoverboard Lifting Kit, www.jimmygreen.co.uk (£49.50)
Stainless Steel Folding Boarding Ladder www.mysticstainless.com (from \$386).

HYDROSTATIC PRESSURE RELEASE EFFECT

If the MOB is more or less vertical in the water, the legs will be subject to hydrostatic pressure, which has the effect of squeezing blood out of the lower parts of the body towards the central circulation (heart) system. As a consequence the blood pressure increases and the heart pumps up to 66 per cent more blood per minute. This can cause cardiac arrest or a 'stroke', especially in those already suffering from high blood pressure. If the MOB survives the initial submersion and the effects of 'cold shock', then they might be forgiven for thinking that this hydrostatic pressure was no longer a problem for them. Unfortunately, it is a double-edged sword. If an MOB is raised vertically from the water, then as they are raised the hydrostatic pressure squeeze to the lower limbs will be removed at the same time as the restoration of full gravitational force, resulting in an

immediate rush of blood into the legs. This may cause a rapid drop in blood pressure, which again can give rise to loss of consciousness or, for those with related coronary artery problems, even cardiac arrest.

Tragically, there are numerous reported incidents of MOB's losing consciousness and dying during their rescue. For this reason, helicopter hi-line lifts are now usually carried out with the MOB casualty held in a semi-horizontal position. Whilst this problem of hydrostatic release is real, it is important to keep it in context. If the MOB has only been in the water for a relatively short time (less than 30 minutes) and is therefore unlikely to be suffering a significant degree of hypothermia (i.e. he is still capable of movement), then horizontal lifting is of less importance than is the risk of his drowning. The longer the MOB

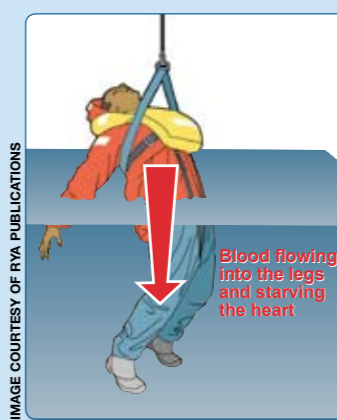


IMAGE COURTESY OF RYA PUBLICATIONS

As the MOB is raised from the water, blood rushes into the lower limbs (red arrow), starving the heart of blood and possibly leading to loss of consciousness and cardiac arrest

individual has been in the water for some time, they are likely to be hypothermic. Assuming the immediate threat of drowning has been countered successfully, as is likely to be the case in calm water, the dangers associated with the sudden removal of hydrostatic support will increase in importance. In this case an extra short time period organising the equipment for a horizontal lift could well prove lifesaving. However, the bottom line must be that if the MOB's airway is being threatened with water splashing over the mouth, the priority *must* be to get the person out of the water by whatever means is quickest.

remains in the water, the higher the risk there is of inhaling water, leading to drowning.

Therefore, removal from the drowning threat is far more important than waiting around while assembling the equipment to provide an attempt at horizontal rescue. Alternatively, if the



Fig 1 The casualty should have his feet raised and be strapped in.

M.O.B.

How to keep them safe

In this, the third and final part of our series about man overboard rescue, Clive Loughlin considers the best way to look after a casualty once they've been successfully recovered. Our scenario is very specific – with an experienced skipper and just an inexperienced wife or partner. What exactly should she do now?

We finished off last issue with the MOB recovered from the water and onto a side deck. There we may think the crew's job is over, but this is far from true. The records are full of cases where the MOB died some time after being rescued and, more sadly still, many were completely avoidable.

What to do next

With luck, about the time you get to this stage, the rescue services will have arrived, but if not, it's a good idea to know what you should do to help the casualty. Even if another boat has responded to your Mayday, do not assume that anyone on board will know what they are doing – however well meaning.

What not to do

- Don't try to get them below – the cockpit is quite sheltered and is better than risking a fall down the companionway.
- Don't strip them of their wet clothing at this early stage.
- Don't assume they are OK just because they say they are.
- Don't let urgency cause you to rough handle the casualty. Getting the MOB back on board may feel like a successful rescue, but the dangers are far from over and rough handling can make things worse, possibly resulting in cardiac arrest. It may be

sometime before the victim's own internal systems for regulating blood pressure will return to normal, so fainting or cardiac arrest are still possible.

- Don't give them a hot shower or hot water bottle
- Don't give them alcohol.

What you should do

- The casualty should not attempt to stand; this could lead to dizziness and a fall. Instead they should crawl along the deck or, if unable to help themselves, they should be dragged along the deck.

- Help the casualty to lie down in a sheltered position. The cockpit seats are probably the most suitable with saloon cushions to add comfort and thermal insulation. In this position it will also be relatively easy to administer First Aid, but be sure to strap them in in some way if there is a danger of them falling off. Safety lines clipped on to 'U' bolts and then taken around a winch or cleat can provide a quick solution. If a fully reclining position is not possible then it is best to keep the head and upper body lower than the legs (**Fig 1**).

Conscious casualty

Less severely hypothermic victims (conscious, capable of talking and moving despite

possibly shivering violently) are in no immediate danger provided further heat loss can be stemmed. If a fully conscious, hypothermic casualty is actively rewarmed in a shower, then there is a danger of 'rewarming collapse' due to a fall in blood pressure.

Gently remove wet clothing, towel down and replace with dry clothes, including headwear. Then wrap them in blankets or, if possible, get them into a sleeping bag (**Fig 7**). The aim is to prevent further heat loss and give the body's own metabolism a chance to rewarm the body, through shivering, from the inside out.

There are also high tech but affordable products, such as the

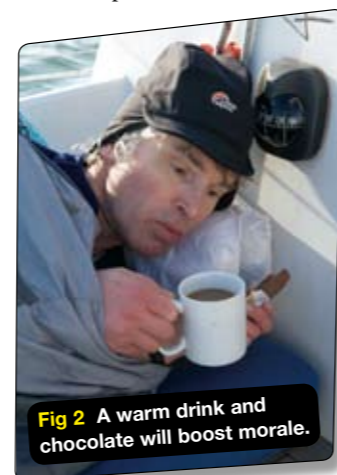


Fig 2 A warm drink and chocolate will boost morale.



Even when back on board, the dangers are far from over.

Ambuwrap hooded blanket, that provide protection from the elements and are easy to use in emergencies (**Fig 3**).

The conscious casualty may also be given warm (not too hot) sweetened drinks and chocolate or biscuits, which will help from a nutritional and psychological standpoint (**Fig 2**).

If they can manage any exercise, such as raising and lowering their legs, then they will rewarm more quickly, but this may not be practical.

A hot water bottle will not be of benefit to our casualty and indeed is likely to be detrimental, because it would encourage the body to circulate blood to the superficial tissues, adding load on the heart, at the very time it needs to be concentrating on keeping the brain alive. The body core needs to warm up, not the skin.

Despite folklore to the contrary, alcohol should never be given to a hypothermic casualty. It may make them feel warmer, but it actually has the opposite effect and dilates blood vessels causing an increased loss of

body heat to the skin and an increased load on the heart. It can also inhibit shivering thereby undermining the body's natural defences.

Semiconscious or unconscious casualties

If the casualty is unconscious or deeply hypothermic (limbs stiff and not shivering), then extreme care should be taken when handling them. It may be better to carefully cut away their clothing with scissors. Place an unconscious casualty in the recovery position and then treat as above (**Fig 11**).

Don't forget the crew

Although the crew will be concentrating on caring for the casualty, it is also important that they continue to look after themselves. A survival incident tends to produce a burst of adrenaline that can give an explosive charge of energy, but at the cost of burning up the body's immediate blood glucose, possibly causing a physical and psychological 'crash' later. If this happens the crew may be unable

to help themselves, let alone care for the casualty. A hot, sweet drink with some chocolate will help.

Prevention first

Everyone knows prevention is better than cure and this is particularly the case with regard to MOB's. So what can we do to minimise the risk?

One very important first step is never to sail beyond the ability of the crew. This has a bearing on both how you sail and the weather you go out in. One contributor told me that when sailing with just him and his wife aboard he had a policy of never going out in anything worse than a F5. This is a sensible precaution that leaves a decent margin for the weather to deteriorate and yet still be manageable. I bet it is pretty popular with his wife as well. Skippers who take the feelings and abilities of their crew into consideration when deciding where and when to sail are likely to get many more miles under their keels than if they make a habit of frightening them in F8s.

Another maxim I use is 'Up early, down late'. Hoist your sails before you leave the shelter of a harbour and drop them only once you are back in shelter. It makes no sense to wait until the boat is being thrown around before undertaking deck work if you can avoid it. In reports in the 1998 LMSRF Crew Over Board Study, a significant number of MOB incidents occurred while crew were grappling with spinnakers and poles (**Fig 8**).

Accidents happen when things go wrong, so preventing them from going wrong should prevent the accident. An example is the rigging of a preventer while you are sailing downwind. By avoiding an accidental gybe you are also preventing the boom and mainsheet from causing injury, but do ensure it can be released quickly from the cockpit.

In my experience one of the commonest causes of accidents, or near accidents, is when things that are meant to be fixed come loose. Lines coming out of jammers can easily result in the mainsheet traveller shooting »



Fig 3 Special blankets can protect the casualty from the wind and rain.

across the cockpit, headsail furling lines letting go and booms becoming free.

Cam cleats should always be treated with suspicion. They are OK for temporarily gripping a line, but will release it too easily. Unless you need to release a line quickly, it should always be secured around a cleat as well. One good example of this would be to secure the furling line of a roller reefed headsails to prevent all the sail being let out in an instant.

The same goes for sheets on self-tailing winches. Don't rely on the self-tailer gripping the line. If it did come free you would soon have a loose sheet cracking around like a whip. If you can't put the line around a cleat then add additional turns around the winch after the line has passed around the self-tailing section. This will greatly reduce the chances of its coming out (**Fig 5**).

Similarly, a mainsheet traveller will typically have cam cleats for gripping the positioning lines. If these come free, then the traveller will shoot across the



Fig 4 An extra half-hitch will help secure the mainsheet traveller.

cockpit. It is much better to cleat these lines off, so if you don't have small cleats specifically for this task, consider fitting them. An alternative is to put a hitch around the cam cleat fitting itself (**Fig 4**).

The mainsheet is trickier. It often ends with the sheet going through a cam cleat as it exits the lower block and it is very easy for this to get pulled out if someone stands on the sheet. The difficulty is that you do

need to be able to release it quickly in a gust or pull it in if you're about to gybe. One solution is to add in a slip hitch. The line can still be released very quickly, but it does help prevent this happening accidentally.

Never put your weight against an object that can come free. On the coachroof, it can be tempting to use the boom for support, but if the mainsheet comes out of its jammer, as in one MOB incident I heard about, you will likely fall overboard.

From personal experience, I can also advise against leaning against the guardwires. These should be secured with cord at one or both ends, so that they can be cut in an emergency, but the lashings need regular checking. I was on the foredeck with a very experienced instructor who used a guardwire for support and when the lashing came undone it was only good fortune that saved him from an unexpected dip.

I would always recommend using safety lines and jackstays in bad weather, but do practice using them in daylight; they can in themselves become a trip hazard. The old maxim of 'one hand for the boat' is essential

and, while moving around on deck, I would make use of both and get used to not letting go with one until the other has a firm grasp on something solid.

Getting in and out of dinghies is particularly hazardous, especially if you have recently indulged in a meal ashore and a glass or three of wine. Wearing a lifejacket is a sensible precaution.

Before starting research for



Fig 5 An extra turn or two after the self-tailing section secures the sheet and is quick to remove.

this article I confess that I was a reluctant lifejacket wearer. I would put one on in rough weather and at night when underway, but the rest of the time it remained in my cabin. Now, having experienced what it is like to be an MOB, and this under ideal conditions, I am making great efforts to wear my lifejacket as a matter of course. Many of the recorded MOB incidents with fatal outcomes occurred not in gales, but in mild conditions and in daylight – the very conditions in which I used to leave my lifejacket below.

The RYA says: "Crew are not expected to wear lifejackets when securely moored or when down below. There will also be many occasions underway when the risk of entering the water is low and an experienced skipper may decide that lifejackets are not required".

This sounds like pretty good advice, but I would add: "It is never wrong to wear a lifejacket". They are there to help when an accident has already happened, but I would prefer people to concentrate on developing an attitude of mind that embraces safety, so as to prevent the accident happening in the first place.

You may feel very safe when you are on a mooring in a quiet creek watching the sun go down (**Fig 10**), but if you happen to fall overboard while relieving yourself at the pushpit, the outgoing tide could have you hundreds of yards offshore before you can say "gosh this water is cold". And even if your crew did hear you fall in, it will still take them a minute or two to get the engine on and let go of the mooring, and a lot longer if they have an anchor to raise.

There is also an argument for wearing helmets, such as those used by canoeists and climbers. This may be a step too far for many sailors, but for special activities, such as going aloft, and for the crew left below, it is certainly worthwhile. Children are used to wearing helmets on bikes and for them it will come naturally to use them on the water as well and it makes good sense given that young children cannot be expected to look out for themselves.

If you can adopt a 'safety first' attitude for your sailing »

HOW WE LOSE HEAT...

A sedentary person typically gives off 80 Watts of heat energy (about the same as a filament light bulb). If we get too cold, we start to shiver and this additional muscle activity boosts the amount of heat generated to about 700 Watts. Our normal body temperature is 36.8°C and we become seriously ill if our core body temperature falls below 35°C, when hypothermia sets in, or if it rises above 41°C.

There are four physical mechanisms for heat loss and it is worthwhile understanding these so that the treatment of our hypothermic casualty makes sense. The four mechanisms are:

- Conduction
- Convection
- Evaporation
- Radiation

Conduction is loss of heat to solid or liquid objects through direct contact and is the major source of heat loss in water.

Convection is loss of heat to air or liquid, warming up the molecules and causes them to rise. These are in turn replaced by cooler molecules.

Evaporation causes loss of heat due to a liquid turning into a gas. When you splash on aftershave the liquid soon evaporates into a gas, absorbing thermal energy from the skin and leaving it feeling cold. Heat is also lost through breath. As we breathe out, water is evaporated from the lungs and heat is lost from the body.

Radiation is the heat you can feel coming from a fire. When infrared radiation hits a body it is absorbed and turned to heat. Radiation is a two way process; if an object is at a lower temperature than its surroundings it will absorb radiation energy and become warmer. If it is warmer it will radiate energy and cool. People radiate from their skin, so it is the temperature of the skin that matters.

When our casualty is in the water, their skin rapidly drops to be at the same temperature

as the water (if wearing normal clothing) and so the heat lost through radiation is minimal. If there is a flow of water over the body then heat lost by convection is significant and conduction between the body and water is also a major factor. There remains the same heat loss by respiration, but all other evaporation will cease apart from the small area of skin that is above water.

This shows why it is important for the MOB to retain their clothing while in the water, because this reduces heat loss by the primary mechanisms of

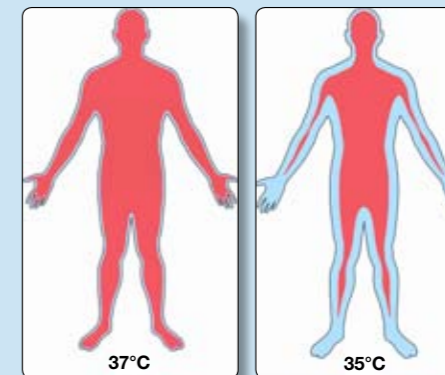


Fig 6 As the body cools, blood flow to the extremities is reduced to conserve heat in the body core. (RYA Publications)

conduction and to restrict limb movements, which accelerate heat loss by convection.

Once the casualty is out of the water a different set of criteria come into play. Waterlogged clothing will be at the same temperature as the sea water, which around the UK will be between 5°C (February) and 15°C (August). This makes it a major source of heat loss by conduction and evaporation, so all clothing except underwear should be removed and replaced with warm dry clothing. This should preferably be fleecy materials that trap air in pockets next to the skin and so help prevent heat loss by convection. In addition, the whole body should be enclosed in a sleeping bag or blanket, so that the body is protected from the wind (convection) and well insulated to

prevent heat loss by conduction. The head is a vulnerable area and should be covered in some way while still allowing the casualty to breathe.

Heat loss by evaporation will not be a problem at this stage provided that the casualty is dry, because the body will not start sweating until the skin is considerably warmer. As the temperature of whatever the casualty is wrapped in is likely to be higher than the temperature of the skin (which will initially be at sea water temperature), heat loss through radiation will be minimal and

this means that the special reflective coatings on survival or 'space' blankets are of no great benefit to a hypothermic casualty. The reflective surface can help keep you warm if you are warm to start with, but once your skin gets cold they provide little benefit apart from as a barrier to the wind and rain.

Marathon runners are often wrapped in space blankets at the end of the race to moderate the rate at which they cool down – not to keep them warm.

Our bodies have evolved highly sophisticated survival mechanisms. As the body

cools, so blood flow to the cold extremities is reduced and is restricted to the inner core and the preservation of the essential organs and the brain (**Figure 6**). In addition, our bodies work to generate warmth by the muscular activity of shivering. To summarise – we need to get the casualty out of waterlogged clothes and into warm dry clothes; we must also protect them from the elements by enclosing them in wind and rain barriers; we should seal them up as best we can to prevent heat loss through convection; they should be wrapped in insulating materials to prevent heat loss through conduction.

A warm, sweet drink and chocolate or biscuits will also be beneficial, both as a source of energy and as a psychological boost. This applies to the rescuer too.

SAILING SAFETY STATISTICS

Here are some statistics. First the bad news...

- 21% of boating fatalities included alcohol
- 80% of fatalities involved people who had never been on a safety course
- 66% of fatalities were from drowning, 90% of which were not wearing a lifejacket
- 82% of fatalities occurred with wave heights of less than 2ft
- 10% of fatalities occurred with wave height 2ft to 6ft
- 3% of fatalities died from hypothermia.

And now some good news:

- Sailing is 1,000 times safer than riding in a car
- Sailing is about as safe as walking
- Sailors who have had training are 466 times less likely to have an accident.

These statistics were largely gleaned from the US Coastguard Recreational Boating Statistics 2007. Unfortunately, I could not find equivalent statistics for the UK, but there is no reason to think our record would be greatly different.

then all actions such as those outlined above will become so automatic that you'll soon be doing them without thinking.

Preparation

Advance preparation and practise of MOB procedures will help raise awareness that will prevent these incidents occurring in the first place, but will also greatly increase your chances of a successful outcome if the worst happens.

In the first article I stated that in a disaster situation typically only 10 per cent of people will take effective action, while 75 per cent behave as if nothing has happened and the remaining



Fig 7 A sleeping bag and a woolly cap help prevent further heat loss.
Fig 8 Below right: The use of spinnaker poles is not advised for our scenario.

15 per cent essentially crack up and act totally inappropriately. These statistics apply to untrained members of the public, but regular training can dramatically increase your chances of remaining calm and tackling the crisis in a constructive manner.

In the course of our trials, I was repeatedly made aware of the importance of actually trying things out. It is only by actually using something, as opposed to just reading about how it is meant to work, that you can learn how to use it and, most importantly, become aware of its limitations.

The subject of preparation can be split into three parts: preparing the boat, the crew and

the MOB. Most of the following has already been covered, but it's worth summarising the main points.

Preparing the boat

Equip your boat with an MOB recovery sling that has been modified to improve its performance by adding a thigh strap, (so that the MOB can be lifted horizontally, **Fig 9**), a lifting eye that allows the lift line to be attached at deck level while the MOB is still in the water, and an extended retrieving line that is at least three times the length of the boat (*Lifesling Owner's Preparation Guide*, developed in conjunction with the Bonnell Cove Foundation).

A boat that doesn't have a recovery sling should at least have a floating throw line with a double bowline in the end and a lifting eye so that it can be used in a similar way to the modified recovery sling. The loops also make it much easier for the MOB to hang on to the throwing line as it is pulled towards the boat. Both the MOB recovery sling and throw lines should always have one end tied to the boat.

An MOB lifting



trapeze, as described in the previous issue, is also a very useful accessory for recovering a conscious MOB and may well prove easier to use.

Every boat needs to have some viable means for a single female crew to lift an MOB out of the water. This can be a masthead line and/or a handybilly. The line (e.g. spinnaker halyard) needs to be long enough to reach the water at anywhere on the boat's perimeter and a self-tailing winch of sufficient size needs to be available.

It's a good idea to mark both ends of the lifting line, so they

are easy to identify in a rush and in the dark. Some stitched-on ribbon or a few inches of coloured whipping should help.

A handybilly can find many uses on a boat (e.g. lifting an outboard), but if you need to use it in a hurry it is important that it be stowed so that it can be retrieved and put into service quickly without spending time untangling it.

In Part 2 we saw how difficult it was to use emergency boarding ladders to retrieve a MOB. A rigid, telescopic or folding boarding ladder amidships is very useful in this application.

Lifejackets should be fitted with crotch straps, a safety harness, lifeline and a storm whistle and ideally they would also have a waterproof VHF and a Day/Night smoke/flare.

Preparing the Crew

The crew need to know how to use all of the rescue equipment that the boat has at their disposal and as a bare minimum all crew should know how to:

- Call for help using VHF, EPIRB and mobile phone
- Don a lifejacket and safety line and then find the pull cord and whistle
- Launch the liferaft
- Read the boat's GPS position
- Switch the engine on and off
- Steer the boat
- Tell where the wind is coming from
- Furl the headsail
- Haul in the mainsheet
- Release a preventer
- Launch flotation devices and recovery lines

- Use a self-tailing winch and masthead lines.

Preparing to be an MOB

"Eighty per cent of a successful rescue is down to the MOB and not the rescuer", (Dr John Leach). I hope that the information in this series of articles will empower the MOB so that they can play an active part in their own rescue.

Becoming Safe

Most consider themselves safety conscious and may well spend considerable sums on rescue devices. You cannot buy safety; it is only by practising with the equipment that any improvement in your safety is made. When the 'Man overboard!' call goes out, is no time to start reading the instructions on your recovery sling or to discover that the line is not attached to the boat.

Safety is mainly an attitude of mind. Develop a safety-conscious approach to your sailing by recognising potential incidents and taking action to prevent them happening.

The best and most practical actions will depend largely on the boat and her crew. I hope everyone tries out at least some of the ideas presented and makes up their own minds about what works for them.

I would also encourage everyone to practise their MOB procedures under structured and controlled conditions. For our trials we had a highly experienced skipper and First Aid and Sea Survival experts on board, plus a well manned safety RIB standing by. I was »

WHAT THE RESCUE SERVICES WANT YOU TO DO

When you send a Mayday in UK waters, one of HMC's Maritime Rescue Coordination Centres (MRCC) organise the response of the RNLI and their own Search and Rescue (SAR) helicopters, as well as those of the RN and RAF. The MRCC will also make

a long range Mayday Relay broadcast to alert vessels in the area. The Coastguard can only start to do something once they are informed of an incident, so it is vital to send the Mayday as soon as possible. Speed is of the essence, but particularly if drowning or hypothermia is to be avoided.

However, sending a Mayday is the second priority – the first is to keep the MOB in sight and get back to them. If the crew loses sight of the MOB or is in difficulties then the first priority is to stop the boat and send a Mayday. If possible both by DSC and voice to maximise the chance of someone hearing you. Even if you're offshore with no vessels in sight, big ships over the horizon will relay your message. Record the GPS coordinates, the time the MOB went in and activate an EPIRB or PLB.

Once an MRCC receives a call they will evaluate the situation and decide which SAR asset(s) would be best able to respond. For our scenario the MRCC will almost certainly send a helicopter and a lifeboat, so the former can fly the MOB to hospital and the lifeboat crew are on hand to help with the yacht.

The RNLI aims to reach at least 90 per cent of all casualties within 10M of lifeboat stations, inside 30 minutes in all weather conditions, so don't delay calling a Mayday. In winter (sea temp 5°C), as long as the MOB is wearing a correctly fitted lifejacket, they will rarely succumb to hypothermia within 30 minutes. But they are unlikely to survive for longer than two hours, so the window of opportunity for a successful rescue can be small. In summer (sea temp 15°C) the window is 2-12 hours. Without a lifejacket the risk of drowning increases.

The MRCC will need to be kept informed of the situation. If the

crew is unable to handle the demands being made on them, let the Coastguard know, so it can prioritise. The crew's priority is to stay close to the MOB.

Rescue by helicopter

The rescue helicopter would prefer



PHOTO: RNLI/NIGEL MILLARD

the boat with the MOB on deck, to be making way using the engine. If you can't use power, take down all sails, listen out on VHF Ch16 for the helicopter and follow their instructions.

Once the helicopter is overhead, the noise will make it impossible to hear them on the VHF. They may spend some minutes hovering alongside and apparently doing nothing. Don't worry, the crew are briefing themselves, assessing how best to do the winching and what their options are if they have an emergency. A winchman will probably be lowered to the boat and once on board he will have communication with the helicopter and can decide what to do. Helicopters also prefer to winch with the boat under way so that there is some wind into which the helicopter can fly.

If the MOB is not on the boat, the helicopter will ask the boat to move away so they can winch the MOB directly from the water.

Rescue by RNLI Lifeboat

Depending on your location and the weather, the RNLI lifeboat that comes to your aid may be a traditional style, large all-weather (12-17m) lifeboat or a smaller inshore (5m-8.5m) RIB. Providing it is safe to do so and if you are able, drop all sails, secure the boom and put the engine on. Maintain radio contact while also ensuring you don't lose sight of the casualty. A handheld VHF or control microphone in the cockpit is vital if only a single crew member is left on board. »



Fig 10 Safe and sound?

It is most important for the casualty (boat and MOB) not to pre-empt what the lifeboat is going to do. The lifeboat crews are highly trained and they will clearly communicate their intentions. Primary concern for lifeboat crews is to assess the welfare of all involved and to identify those at highest and most immediate risk. Once on scene, the RNLI's lifeboat crew will communicate with the MOB and assess the best course of action. Try not to panic. It is vital that the MOB (and the person on board) remain calm.

There are a number of possible approaches for the lifeboat. After slowing down, one possible way is for the lifeboat to come upwind of the MOB's position and then drift down towards them. The MOB should not try to swim towards the lifeboat unless instructed to by the lifeboat crew.

The exact approach of the lifeboat will be determined by the conditions, however it is likely that this will be head to wind.

In rough, windy conditions, the lifeboat will drive towards the MOB, but on recovery the boat will be in neutral.

In calmer conditions the lifeboat will drive beyond the casualty and then turn through the wind and drift down with the beam of the lifeboat adjacent to the MOB. Although this method offers greater shelter for the MOB in the water it's not generally used in extremely rough or windy weather.

To aid recovery, different pieces of equipment can be used by the lifeboat crew, such as the reverse end of a boat hook, a throw line or Jason's cradle (a device that lifts the MOB out of the water), a scramble net (usually used for multiple casualties) or the MOB may be put into a strop and hauled on board. On an all-weather lifeboat one of the crew will usually be dressed in a drysuit to get near to the MOB.

Transfer from yacht to lifeboat

If the crew on board the yacht has already recovered the MOB then a lifeboat crew member will be transferred to the yacht to assess the situation. If it is decided to transfer the casualty, this may be done in one of two ways. In calm conditions, the yacht will have stopped and the lifeboat been brought alongside. In rougher conditions, the lifeboat's Coxswain will ask the yacht to maintain

course and speed. The lifeboat will then prepare any lines or fenders required and notify the yacht as to which side they will approach. Again a lifeboat crew member will transfer to the yacht to assess the best options. It is most important the yacht does not put fenders or lines out because they could become entangled should the lifeboat need to pull away.

This series of articles started out with the statement from Dr John Leach (author of *Survival Psychology*) that "80 per cent of a successful rescue is down to the victim, not the rescuer". A vital component of survival is the will to live. The MOB should be regularly reassured that you are coming to get them and/or that assistance has been summoned. If you are the MOB, don't give up. Keep fighting to survive.

RNLI statistics

RNLI rescue figures for 2007 show an increase in the number of MOBs for leisure craft – rising from 161 (2006) to 201 (2007). An industry expert panel review, including the RNLI, MCA, RYA and maritime experts, found that out of 42 maritime fatalities in 2007, 29 (69%) would have, in their opinion, resulted in a non-fatal outcome had the victim been wearing a lifejacket. RNLI Sea Safety Manager, Peter Chennell, says: "It is worrying to see such a large increase in MOB incidents, so it's crucial that all boaters know what to do in a man overboard situation and that lifejackets are being worn at all times."

Key facts about the RNLI

RNLI volunteers provide a 24-hour SAR service around the UK and Irish coasts.

It operates from over 230 lifeboat stations and has more than 100 lifeguard units on beaches. Independent of Coastguard and government, it depends on voluntary donations to maintain its rescue service (www.rnli.org.uk).



Fig 11 An unconscious casualty should be placed in the recovery position.

wearing a dry suit and lifejacket with an integral sprayhood and we did the trials in August when the Solent was 17°C. The boat was on a mooring, which actually increased the difficulties caused by the tide.

Having completed our trials I would regard the precautions we took as the bare minimum. This is clearly beyond the scope of most individuals, but well within the capabilities of most sailing clubs and cruising associations.

In the USA, many clubs already have such schemes in place and run courses entitled 'Suddenly Alone'. Unfortunately in the UK very few organisations run such courses. Chris Brown of the Royal Harwich YC has kindly agreed to offer guidance to any clubs wishing to set up their own (see below).

Final thoughts

Fortunately MOB incidents are rare and most of us will go through our sailing lives without experiencing one. So why bother learning what to do in a situation that's unlikely to occur? Because the acquired skill and experience will let us enjoy our sailing even more and may have a direct bearing on our own survival and ability to help others. I know that many couples are concerned about what they would do, but rather

than tackle the problem head on it's avoided all. Fingers are crossed and sailing undertaken with an atmosphere of anxiety hanging over it.

Better, in my view, to banish the demons with knowledge and experience so we can enjoy our sailing. ■

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PRIMARY SOURCES OF INFORMATION

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SUDDENLY ALONE COURSES

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