

Establishing a routine for watch-keeping is vital on any passage, whether it's just for a short overnight trip or a voyage across the Pacific because it's important that no crew member is allowed to get too tired to perform, particularly if conditions suddenly deteriorate, or because the passage takes longer than expected.

In many ways, shorter passages are even more important than longer ones, because by definition, the boat is closer to the coast and perhaps amongst shipping; there will be more navigation required, and perhaps frequent alterations of course to avoid collisions.

When starting out there's often a reluctance to start the watch-keeping routine. Perhaps it's a nice sunny afternoon, and the boat is going well. Nobody wants to go below. Besides, nobody is feeling tired yet. Or maybe it's rough. Everybody is on deck, dressed for heavy weather. Nobody can face the thought of getting undressed, only to have to struggle back into their gear to come on deck again in a few hours time. They know they will feel queasy when they go below. Much better to stay on deck until it's time for their watch!

The big danger is that everybody will get tired at the same time. Then the problems start. Nobody feels up to going forward to put a reef in, so it's left too late. The navigator gets so tired he starts making silly mistakes, like giving the reciprocal of the course. We've all done it. The watch routine should be set out before the boat even gets under way. Somebody may feel like a rest early on, perhaps after a long drive down to the boat, but if there's no watch schedule, he may postpone it, not wanting to appear to be shirking. If the watch schedule is only set after several hours, he might find himself faced with a long night watch, having missed a good opportunity for a sleep.

So it's vital that, before the passage starts, the skipper discusses the watch routine. That way, all the crew know right from the start when they are expected to be on watch. The skipper must encourage the off-watch to get some rest, and for the whole crew to get into the routine as quickly as possible.

The traditional watch routine, which is still practised by most navies throughout the world, has four-hour watches, starting at midnight. They go like this: 00—04, 04—08, 08—12, 12—16, but at 1600 hours they change to two watches of two hours each: 16—18, 18—20, with a last four-hour watch, 20—00 to finish the twenty-four hour day. These two-hour watches are called the 'Dog watches', and result in the day being split into seven periods. This means that the watches rotate each day, so nobody is on the same watch for two consecutive days. The watches are said to be 'Dogged', and it certainly stops any wingeing from a crew member who feels he's being hard done by, perhaps because he always gets the midnight to four watch.

That's the only benefit from this system — at least as far as I can see. Notwith-



HOW DO YOU SLEEP?

JOHN CAMPBELL ON WATCHKEEPING

standing the might of the world's naval forces, I feel there are some other watch systems which are perhaps better suited to life on board a yacht. Before we look at them, it might be helpful to take a brief look at the nature of sleep itself, since a vital part of the watch system is to ensure that the crew get enough rest, to carry out their 'watching' routine.

I'm sure that everybody is aware of our so-called body clock, which is geared up to a twenty-four hour rhythm. This is called the Circadian Rhythm. Upsetting this rhythm, by flying east or west into another time zone, results in 'Jet-lag'. The circadian rhythm is controlled by a region in the brain called the Hypothalamus, which is triggered by the periods of light and dark. So once we've flown to a different time zone, the new periods of light and dark tell the hypothalamus to reset the clock, and within a few days, we adjust to the new rhythms, and have recovered from the tiredness and lethargy of 'jet-lag'. By artificially altering the periods of light and dark, it's possible to fool the hypothalamus into setting up a different rhythm. We can adjust to a 'day' as short as 18 hours, or as long as 28 hours, but outside these limits, the hypothalamus smells a rat, as it were, and switches back to a twenty-four hour 'day'.

So if we are not to feel the effects of 'jet-lag' (or perhaps we should coin the phrase 'watch-lag') throughout the passage, then it's important that our bodies should keep to the 24-hour rhythm that they are used to. This, for me at any rate, is made more difficult by a watch system which changes daily. But more of that in a moment.

As regards sleep itself, I think most of us have heard of the terms REM (for Rapid Eye Movement) and non-REM sleep. Laboratory studies of sleep show that we start off in non-REM sleep, and

then in cycles through the night experience periods of REM sleep. Most people need around eight hours of sleep a night, and usually experience four periods of REM during this period. The first period of REM is usually quite short, perhaps as little as five or ten minutes, but each succeeding period of REM is longer, so about 25 per cent of our total sleep is REM.

REM sleep appears to be light sleep. Muscles twitch, and of course the eyes move, and this is the period when at least our remembered dreams occur. However, when somebody is woken up from a REM sleep, they feel that they were deeply asleep, and it seems much more of a struggle to wake up.

Non-REM sleep has been found to have four different levels, with the fourth level being the deepest sleep. Experiments have been done, depriving people of different types of sleep, and the only one that has been found to be essential, is the fourth stage of non-REM. For periods of several days, we can manage without any of the other stages of non-REM, or any REM periods at all, but if deprived of the ration of 4th stage non-REM, we would soon become fatigued, lose the ability to concentrate and perhaps hallucinate.

When deprived of sleep, these symptoms wax and wane through the twenty-four hour period. To some extent the effects can be overcome by making an extra effort, especially if we can time jobs to be done when it suits us, as subconsciously we will choose a time when the effects are at a minimum. The jobs that suffer most are those which have to be done at a specific time, possibly navigation, or sail changing, which by chance may coincide with a period when we are at a low ebb. We may suffer from lapses of memory, or make serious omissions. It's thought that these are due to periods of 'micro-sleep', when we actually go to sleep for brief

moments without being aware of it.

Under normal conditions of sleep, most people first go into 70 to 90 minutes of non-REM sleep, and during this first period, pass through all four stages of non-REM. A brief period of REM is again followed by another 70 to 90 minute period of non-REM, again covering all four stages.

These cycles continue through the night, with longer periods of REM, but the non-REM sleep rarely reaches the fourth level again, but stays mainly at the second level. So although the fourth level of non-REM is essential, it's usually only reached twice during the sleep cycle.

If we can achieve a four-hour sleep period, then it's likely we will reach the required 4th stage of non-REM, at least once, but hopefully twice. The balance of our sleep can, if necessary, come as 'cat naps', and although we are unlikely to achieve our normal quota of REM sleep, we could go for several days without suffering unduly. If the four-hour period is broken, and we miss the 4th stage of non-REM sleep, there will be problems sooner rather than later.

It's interesting to see, that once a watch keeping schedule is established, and everybody has settled down, each crew member will have one particular off-watch period where they feel that they usually sleep well. This is most probably when they are getting their stage four non-REM sleep.

It would appear possible that we would get our quota of stage four from two periods of two hours each, but unfortunately, this is not usually so. In our normal sleep pattern, our body starts to produce adrenalin a couple of hours before our normal wake up time, to prepare the body for the rigours of the coming day. Once our circadian clock has got used to our watch schedule, most people will wake up in time for the next watch without being called. Probably, we are getting a little shot of adrenalin to set us up ready for the watch. If we're trying to wake up after just two hours, the adrenalin might come too soon to let us ever reach stage four, so one four-hour sleep is much more likely to give us the ration of stage four, than two periods of two hours.

Sleepwalking is restricted entirely to stage 4 non-REM sleep, and sleepwalking (or if you want to sound scientific, Somniloquy) is most common in stage 2 non-REM. Whilst I have yet to be shipmates with a sleepwalker, I've sailed with several sleepwalkers, which can be an unnerving experience, I was once delivering a boat through the Bahamas to Florida, with a young lad as crew. We had had some bad weather, and were both feeling tired. I decided to anchor in a small bay in the Berry Islands, so we could get a good sleep before carrying on.

I wanted to make the landfall myself, so stayed on watch for a bit longer than usual. It was a black old night, and I was feeling my way slowly into the bay, going by the sound of the breakers on the rocks as much as anything.

A sudden yell from up forward almost gave me cardiac arrest, and I turned the boat round before I realised it was my crew talking, or rather shouting, in his sleep. Because I had let him sleep longer than usual, he was into an extended period of stage 2 non-REM, and this encouraged his sleepwalking. Like most sleepwalkers, he could remember nothing of the incident when he woke up, because if we do have dreams in non-REM sleep, we don't remember them.

So, now we have an appreciation of the different types of sleep, how does this affect our choice of watch routines?

For a short passage, say to a maximum of 48 hours, the problem is mainly one of getting enough food and some rest. Not many people can slip straight into a watch routine. For most of us it takes a day or two to 'get our seals'. Most of us don't

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have much of an appetite, nor sleep too well for the first couple of days, so a good plan for a short passage is short watches, with lots of snacks.

It's on the longer passages that the importance of a good routine becomes more important. What this routine is, somewhat depends on the number of crew on board.

For two people, if they have to steer the boat, three hours on watch is about all you can manage if it's rough or cold. As we've seen, four hours is a much better period for the sleeping crew member, so four on, four off should be attempted if conditions allow.

If the boat has some form of self-steering, the problem of being on watch for a longer time is reduced. Lana and I have made several passages doing three on, three off at night, and six on, six off during the day, with the Aries doing all the work. The night watches always seem twice as long as the daylight ones, so three hours is plenty, and we each get a six-hour watch below, to get our stage four non-REM sleep. We eat at 0600, 1200 and 1800, with snacks at night. I dislike the dawn watch. I always seem to get cold just before the sun rises, but fortunately Lana likes this one, looking forward to the approaching dawn, so we don't dog the watches. If such an amicable agreement cannot be reached, it's probably better to swap watches at the end of each passage, rather than each day, so your body can get used to getting the six-hour period at the same time each day.

With three crews keeping watch, the

obvious thing to do is to go two on, four off in cold or rough weather, or perhaps three on, six off in milder weather. The problem with this, strange as it may sound, is getting too much sleep. Sleeping at sea is difficult enough, and if you are not tired, then it may become difficult to get to sleep. If you don't manage to sleep at all during an offwatch, then by the end of your second watch period, you will be very tired indeed.

So, with three people, it may be better to elect somebody as cook, and let the other two do three on, three off, with the cook doing a watch at dawn and dusk. This way, the cook sleeps through the night, and is as fit as possible for the rigours of cooking—while, by taking a morning and evening watch, each of the other two get a long sleep to ensure their stage 4 period.

With four people, my choice is to keep two people awake at all times. Rather than stand a simple watch on, watch off, we've found a very good system is to stand a two-hour watch, preceded by two hours on standby. In bad weather, we have the standby person kitted up ready for action, but otherwise, the only rule is to be awake. So the routine becomes two hours standby, two hours actually on watch, followed by four hours off. A big advantage of this system is that every two hours there are three people awake, so usually reefing or sail changing can be done without waking the off watch crew. A possible disadvantage is the traffic through the boat every two hours, but if consideration is shown for the sleeping person, it's not usually a problem. In fact there's often a sadistic pleasure in hearing somebody else having to go on watch in the rain, knowing you have another two hours left in which to sleep.

With five crew, we usually have the cook stand out of the system. There's more than enough work keeping five people fed, without having to be up half the night. If the cook feels left out, she or he can take a watch for each of the other crew members in turn, giving them a long sleep every four days. And as landfall approaches, the cook could stand watch for the skipper, leaving him free to navigate.

Another advantage with this type of staggered watch system, is that if two crew are stronger, or more experienced than the others, the schedule can be arranged so that one or the other of them is always awake, either on watch or standby. This can reduce the number of times the skipper has to be called.

With six or more people it's probably best to divide into two watches. Traditionally, these are called port and starboard, and it's possible to do four on, four off though my preference would be to do six on, six off, with a mini watch system running inside the watch, taking regular turns to be on the helm or on lookout.

When on watch, it's very important to remember the off-watch crew. Even if racing, it's better not to keep working the winches every two minutes. The boat will go faster, and everybody will get along

better if they all get enough sleep. We had one crew who, as he got bored towards the end of his watch, always started trimming sails. He could never understand that it effectively deprived the next watch of their last half-hour of sleep, and maybe even stopped them getting their ration of stage 4. Nearly always, the fine trimming can be postponed until the change of watch.

When you do change, it's important not to be late. When called, make sure you stay awake. Don't snuggle down for a last five minutes. Adopt the habit of getting straight out of your bunk. There's nothing worse on a cold wet night, having stared at the minute hand creeping round ever so slowly to reach the end of the watch, than to have your relief come up even a minute late. If you want to acquire a friend for life, relieve your predecessor from his watch five minutes early. There's no better feeling in the world.

A good watch keeper will also try to avoid the 'While you're there . . .' syndrome. It's infuriating to sail with somebody who always waits until you've summoned up the energy to get a drink or snack, and who pipes up, 'While you're there, will you get me one please?' Remember, it is no easier for him, he feels just as lethargic as you do. The very uttering of the words 'While you're there . . .' should be punishable by doing all the washing up until the end of the passage, or until somebody else says the fateful words.

Always try to remember that somebody is probably trying to sleep. Save your singing for the bath, and don't forget it's bad luck of the highest order (as well as being very irritating to potential sleepers) to whistle on board a boat. We had one young crew member for a long distance, who could only survive a standby period with his Walkman. Once his earphones were on, he became oblivious to his surroundings. At least we didn't have his music inflicted upon us, but unfortunately he was a frustrated drummer, and many a sleep was disturbed by him beating time on the coaming, or singing and whistling along with the chorus. He was fortunate to make the landfall.

When leaving somebody on watch, it's important that the skipper is explicit in his instructions. I always make a strong point that I would rather be called unnecessarily, than not be called when I should have been. So don't be shy about calling the skipper and be sure you understand his instructions *exactly*.

We have a friend, who was navigating down the reef-strewn Red Sea coast. He picked up the expected lighthouse fine on the starboard bow, and went below, with instructions to the watch to call him when the lighthouse came abeam when he planned to alter course.

He awoke of his own accord several hours later, to see to his horror that the lighthouse was flashing away far astern.

'Why didn't you call me?' he asked the crew.

'But it never did become a beam,' he said. 'See, it's still flashing now.'