LIGHTNING NEVER STRIKES TWICE!
Bob and Elaine Hazell

(Since leaving the Hamble in June 2008, Bob and Elaine have sailed over 37,000 miles aboard Pipistrelle, their Wauquiez 48PS. At the time of writing they were in Madagascar, heading for South Africa and Cape Town by the end of the year and the Caribbean by May 2016, where they will complete their circumnavigation. Follow their journey at www.yachtpipistrelle.wordpress.com.)

Lightning never strikes twice ... or so the saying goes. But in our case this is not quite true! Three times is the score for Pipistrelle – once in Curaçao in the Caribbean, once in Fiji and now in the Maldives. But whereas the first two were electromagnetic pulses, this was a direct lightning hit to the top of the mast. Read on ...

The tropics are renowned for frequent lightning, and nowhere more so than Malaysia and Thailand. We had investigated installing a lightning protector in New Zealand but, with a quoted cost of NZ$15,000 and no guarantee it would work, decided not to go ahead. So we were relieved to move on westwards from Thailand, and away from the frequent electrical storms. Our first stop was Trincomalee in Sri Lanka, where we were one of the first yachts to visit after the civil war. This stopover was infinitely preferable to Galle in the south, both in terms of the anchorage – which was protected – and cleanliness, plus it was easy to visit Kandy and the tea plantations at hill stations ‘up country’, which are beautiful.

Pipistrelle at anchor in the Maldives, April 2015
We then made for the northernmost of the Maldivian islands where we could check in, and were made really welcome in Uligan, where the agent brought us a present of ice cream! Sailing south through the Maldives was uneventful, but we did enjoy seeing the many atolls and anchorages. The snorkelling was stunning.

Our next major stop was the capital, Malé, for re-provisioning and refuelling, after which we left for Gan. An overnight passage between two atolls was needed on the night of 6/7 April 2015, but while the weather forecast predicted rain, there was no mention of lightning. In the early hours, while Elaine was on watch, the radar showed cumulus nimbus ahead and we saw lightning, but it was moving away from our path. After the change of watch at 0300 Bob continued to monitor developments by radar, and saw with concern a huge bank of cloud behind Pipistrelle, moving against the wind and catching us up. He altered course towards a nearby atoll, but as the cloud went overhead there was a huge bang, crack, and simultaneous flash of lightning. We had suffered a direct hit to the top of the mast.

Though Bob felt the shock of the impact, and Elaine’s off-watch slumbers were severely curtailed, we were both unhurt if a little shaken. But there was a strong smell of burning in the aft area of Pipistrelle (one cause could have been the PCB for the autopilot or the earth wires to the P bracket). As there was very little wind associated with the cloud we were motor-sailing at the time. We lost all instrumentation, autopilot and engine controls, as well as having no charge from the alternators and no VHF. With the engine cooling fans eating 10 amps, we shut the engine down manually to conserve power. We have electronic engine controls as the engine could be controlled from the saloon or the cockpit but, once stopped, the engine could not be started again! We were out of mobile phone range, but used the satellite phone
our only means of communication – to advise our Maldivian agent and sailing friends in the vicinity of our situation by e-mail.

At the time of the strike we were making our way south outside Gaafu Dhaalu Atoll, about 15 miles offshore. With no wind and no engine we were drifting, and the current was taking us northeast towards Kolamaafushi. We were helpless, with no idea whether wind would appear before we were swept onto a reef, a worrying situation. Eventually we had one bar on the mobile and were able to call our friends Neal and Ruthie on Rutea. As luck would have it they were anchored only 10 miles from our position and motored out to meet us with crew from two other yachts. Shortly after they arrived so did the wind, and we were able to sail towards their anchorage, where Tom from Pakea Tea strapped his dinghy alongside and used his outboard to drive us into the anchorage.

Once anchored we heaved a sigh of relief, had a relaxing lunch, and then began checking the damage – a tedious and difficult job, trying to identify the precise cause of electrical failure and whether there was a workaround. We found that the generator started but created no AC, and that both the 12 and 24 volt alternators were also wiped out, so we were unable to charge any of the batteries. Fortunately our new solar panels kept them partially charged, with the fridge and freezer turned off overnight (not ideal in that latitude). The following day Neal and other yachties came over, and between us we bypassed the Micro Commander which controls the main engine electronically. Neal found a spare switch on Rutea to start the engine and made a clever lever to act as a throttle, so with a floor hatch open by the companionway we were able to change gear and increase the speed of the engine by manually moving the cables.

We could now move Pipistrelle carefully, but hoisting the mainsail using the electric winch depleted the batteries, so it was hoisted by hand (curiously, the anchor windlass and all the electric winches still worked). With 72ft of mast and a very heavy sail this was not as easy as it sounds. Manoeuvring was not straightforward either, with Bob down below on the engine controls and Elaine on the wheel calling engine instructions as he popped his head up into the cockpit.

The improvised engine controls
Helmut and Kerstin on *Lop To* kindly offered to buddy boat us to Gan on Addu Atoll, which we thought made sense, rather than returning to Malé on our own. They led the way to a couple of anchorages in between, before the final 60 mile overnight leg to Gan. Following another yacht’s tricolour is far easier than steering a compass course, providing one checks the chartplotter frequently! On arrival we anchored between Gan and Heydhoo, and all repairs were undertaken in the lagoon or at anchor outside, in 35m of water.

The following equipment had been taken out by the strike:

- VHF and masthead aerial, which was split
- AIS and AIS B
- Tricolour and anchor light, which still smelt of burning two weeks after the strike
- All navigation, depth and wind instruments including the main GPS
- Autopilot
- 12v and 24v alternators
- Micro Commander engine controls
- Generator AC supply
- Timer delay switch for grey tank
- Galley lighting
- BEP DC voltage and amp meter
- Victron 24v DC to 12v DC converter

The mobile phone, sat phone and e-mails were heavily used to advise our insurance company, Admiral Marine, and the providers of the affected equipment of our plight. One of these calls was to Steve Gilmour of Category 1 Marine in New Zealand, who had replaced the Kubota motor on our FP generator in 2012. An extremely competent marine engineer and sailor himself, he took such an interest in our problems that he became our natural choice to ask whether he would consider flying to Gan to help us replace the equipment. The answer was ‘yes’. With the quick agreement of Admiral, flights and accommodation were booked. Between them, Bob and Steve very successfully project-managed the ordering, transport and arrival at Gan airport of all the necessary replacement kit, which arrived from NZ, Australia, Germany, the US and the UK.

The Maldives are probably one of the worst places for the import of spares and, because of the complexity of most of our electrical and electronic systems, we did not want to rely on local labour. DHL is by far the best shipping agent, and fortunately our agent in Gan charged us only for his time. We also discovered that local replacements such as alternators are not like-for-like and would not fit: don’t waste time, order the precise part needed from a reliable source.

_Pipistrelle at anchor in Gan_
Steve flew in on Saturday 25 April and by Saturday 2 May everything was working except the generator. Whilst we had taken the manufacturer’s advice that the windings were probably affected, no mention was made of the PCB in the control box. The windings weighed 80kg and were shipped from Germany. Steve split the generator, removed the old windings and replaced them with new windings and the armature.

Countless tests and checks were to no avail and eventually, to save time, we contacted Fischer Panda in Germany direct to order the parts for the new AC control box. When they finally arrived the PCB bore no resemblance to the old one, because FP in their wisdom decided that all the components would be okay, they just needed transferring from one board to the other, which was a complex and time-consuming task.

There is little one can do to avoid a lightning strike – we were very lucky it did not happen during an ocean passage and just hope that this was the last occasion for Pipistrelle. Our fellow yachtsies could not have been more helpful or supportive – the international sailing community is quite remarkable at times like these, and we know of so many instances when yachtsies have gone out of their way to assist others in trouble.

We were also extremely fortunate to have an outstanding and understanding insurance company in Admiral, who did not quibble once. Once our claims manager, Bob Samuels, understood the problems and what we were doing to overcome them, could not have been more helpful and supportive. He even monitored and replied to e-mails at weekends ... added to which their premiums are highly competitive.

Our thanks also go to Steve, who worked like a Trojan for eight hours or more each day in very hot, cramped conditions, and was a tower of strength. When the additional issue with the generator manifested itself, he extended his stay by two days hoping he would be able to resolve the problem.
Steve accessing the main engine from Aladdin’s Cave

We finally sailed from Gan on 27 May, the B&G autopilot getting us to the Seychelles. We plan to have the remainder of the repairs undertaken in South Africa and until then, and maybe longer, the insurance claim will remain open.

Home sweet home!
Lessons learned

For other cruisers, this might be a useful checklist:

1. If, like ours, your engine controls are electronic, learn how to insert a switch from a relay, so that you are able to start the engine;
2. Use the lever on the side of your diesel engine to stop it;
3. Learn how to remove the cables from your control box, and then use them to change gear and control the engine speed;
4. Alternators are susceptible – carry spares, and ensure they fit the mountings;
5. You will probably need a puller to remove the pulley for the drive belts on the alternator;
6. Any printed circuit board is susceptible. Whilst carrying spares is probably not feasible, bear in mind that any of them could be affected;
7. The AC control box on our generator was damaged, meaning that even a month later we still had no method of creating AC other than from a small inverter we had acquired;
8. Our 24 to 12 volt DC converter, which provided the power for all the nav instruments, was taken out. This is one thing which is small enough for a spare to be carried;
9. We were lucky that our SSB and sat phone were not damaged – plan for how you would communicate following a lightning strike;
10. Place all small items like laptops, tablets, sat phones and handheld GPS units in the oven, which acts as a Faraday cage.