



Emergency VHF antennas

In a dismasting, you'd want to be able to rely upon an emergency VHF antenna to maintain radio contact. Alex Bell and a PBO test team put five examples to the test

Dismasting is one nightmare scenario all sail boaters have to be prepared for. Over the years I have been sailing, I've experienced a few such situations; two were in my dinghy days, close to shore, no big deal. Two more were with keelboats: the first was a spreader failure on a quarter tonner, resulting in the mast breaking at the spreader, while the second was after being T-boned at the start of a race – the whole rig came down.

In both cases my main VHF radio was rendered useless, but in the second incident we made radio contact with a handheld and were able to communicate with the start boat. They requested an airlift for an injured crewman. The problem with handheld radios is, of course, their range. With, typically, 5W maximum transmission power and an antenna fixed to the set, range is limited – depending upon the atmospheric conditions – to around 4 miles.

This is where an emergency antenna comes in useful. Firstly, it can be connected to your main radio and deliver 25W of power: secondly, there is the potential to raise the aerial as high as

The test team



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possible to extend its range should help be needed. For this reason emergency VHF antennas are required under ISAF Offshore Special Regulations for certain safety categories (0, 1, 2, 3) for offshore yacht racing, when the regular antenna depends upon the mast. Under race conditions it would be reasonable to expect that other competitors may be close enough for radio contact, either from a handheld radio or using the main set with an emergency antenna and thus able to render assistance.

Available for the UK market are five makes of emergency VHF antenna: Bantén, Glomex, Pacific, Shakespeare and VTronix. We also decided to include an AIS antenna which would more typically be attached to the pushpit and hence survive the loss of the main mast antenna.

How we tested them

We used our standard test for VHF radios and antennas, be they main sets or handheld. We placed one boat, a Beneteau First 305 (*Symphony*), on a mooring buoy off Calshot in Southampton Water and our second boat, a Nelson 42 (*Trinity Star*), 'steamed' in a south-easterly direction, stopping at regular distances to test the antenna's range.



Symphony in Southampton Water

One practical aspect of deploying an emergency antenna with your main radio is access to the antenna connection at the rear. Ideally it should be easily accessible, without having to remove the radio from its location at the navigation station.

The Beneteau First 305 has an air draught of 12.6m: on the Nelson, the emergency antennas were attached at a height of 2.5m.

Emergency VHF antennas we tested

Bantén 00045

PRICE: £39.95

contact: www.banten.it



The Bantén is a short, stubby, rigid helical coil antenna and comes with 5m of cable packed in a PVC waterproof screw cap tube.

Attachment is facilitated by the use of two silicone rubber straps to wrap around a pole or mast and with a hole-over-stud

closure set 60mm apart. Attachment to a pole using the two stretch rubber straps was straightforward.



Shakespeare 5911

PRICE: £67.82

contact: www.shakespeare-ce.com



The antenna is a white, flexible, rubber-coated helical coil. It comes packed in a 300mm-length translucent waterproof tube with 3.7m of coaxial cable. Mounting options are via a rubber suction cup onto a suitably flat surface or using suitable lashings.

Two adhesive Velcro tapes are provided for storage options.

Though the circular rubber suction cup achieves a quick, secure mounting at coachroof level, it doesn't lend itself to attaching to a pole!



Technical talk

Two factors are specified by antenna manufacturers: VSWR and gain.

VSWR stands for voltage standing wave ratio, and is also referred to as standing wave ratio (SWR). VSWR is a function of the reflection coefficient, which describes the power reflected from the cable and antenna. If the combination of connections, cable and antenna were perfect, the VSWR would be 1:1. In reality, it is more likely to be between 1.1:1 to 1.5:1 (as for the antennas tested).

ANTENNA GAIN: This is a relative measure of an antenna's ability to direct or concentrate radio frequency energy in a particular direction or pattern. The measurement is typically measured in dBi (decibels) relative to an isotropic radiator. An isotropic radiator radiates in all directions in a spherical pattern: an antenna which performs like this would have no gain written as 0dBi. A 3dBi antenna is more focused and concentrates the power into a narrower beam width in the horizontal plane. A higher gain, say 6dBi, would concentrate it so narrowly it could miss the receiving antenna when the boat heels. (See PBO Oct 2012*, '8 antennas tested' for a fuller description). *Available from the Copy Service, Tel: 01202 440832

Emergency VHF antennas we tested

VTronix Shorelink 156

PRICE: £68.95

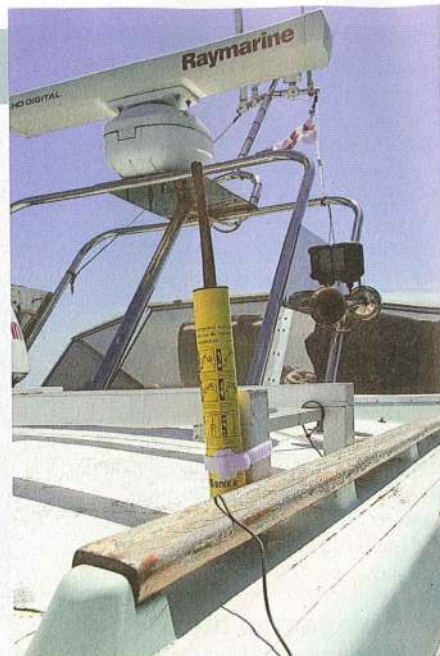
contact: www.shakespeare-ce.com



The antenna comprises a black, rubber-coated helical coil. The aluminium tube container, like the Glomex, acts as a base for the antenna which, once removed from the tube, is then screwed to one end. Comes with 6m of miniature coaxial cable (RG174).

The antenna can be mounted on a painted aluminium bracket (provided). Two lugs attached to the storage tube engage with the bracket. This would require a predetermined site for the antenna onto which the mounting bracket would need to be attached (by two screws provided). Conversely, it could be used to store the antenna on a suitable bulkhead, with the antenna attached by insulation tape or a lashing to a suitable pole. The Shorelink Antenna has step-by-step multilingual instructions printed on the case for the unskilled user.

The support tube length (250mm) made for easy lashing to a pole, and the Shorelink had the most compact storage tube.



Glomex Emergency Antenna

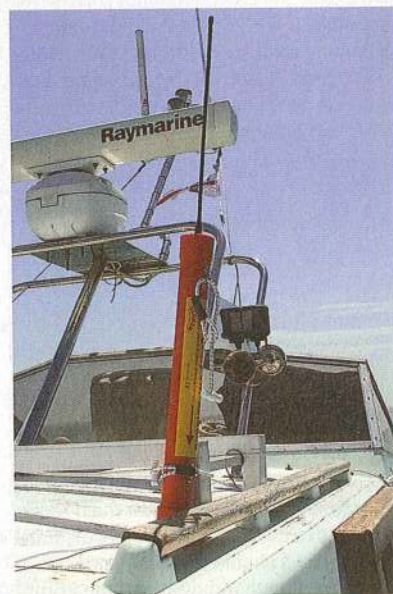
PRICE: £69.95

Contact: www.glomex.it



The Glomex, with by far the largest storage pack of the antennas as tested, cleverly makes use of the PVC waterproof storage tube to form the base for the antenna. Once removed from the tube (screw cap closure) the flexible rubber-coated helical coil antenna is attached by a bayonet connector to the closed end. The tube can then be lashed to a suitable pole or mast. Attachment provided is through two bungee straps attached to the tube by two stainless steel half-round brackets. Closure is through plastic toggles. The straps are set 310mm apart. Comes with 9m of coaxial cable.

Attachment to a pole was easy using the two bungees provided. The long support tube (490mm) would be easy to attach to a halyard, and the coaxial cable was also the longest on test.



Pacific PA6031 Seamaster

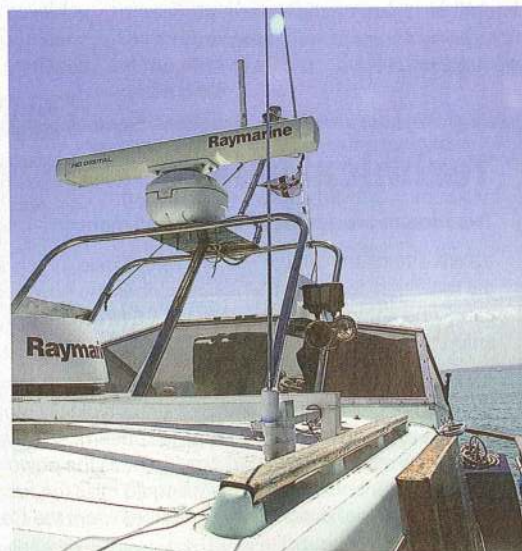
PRICE: £78.55

Contact: www.pacificairials.com



The Seamaster antenna is an eight-section stainless steel telescopic tube, giving a length of just under 1m. This is then mounted on a short circular plastic tube base. Attachment is through two Velcro straps set 35mm apart. It comes packed in a translucent, water-resistant tube with a push-fit closure cap. Three different 'Fastfit' connectors are provided: PL259, BNC and SMA. Comes with 5m of coaxial cable.

The Velcro straps provided were not the easiest to attach to a pole because of their close proximity. It's important that the antenna must be fully extended for effective use, but it's not as robust as the short helical coils. On test, this had the best reception at the 4NM range.



Make	Banten	Glomex	Pacific	Shakespeare	V-Tronix
Type	Rigid plastic-coated coil	Flexible rubber-coated coil	Telescopic stainless steel whip	Flexible vinyl-covered coil	Flexible rubber-coated coil
Model	00045	RA114	PA6031	5911 Stowaway	SL156
Antenna length	240mm	350mm	950mm	160mm	150mm
Weight	420g	800g	400g	390g	295g
Frequency range	156.8MHz	156-162MHz	156-162MHz	156-162MHz	156-162MHz
Gain	3dBi	1dBi	3dBi	3dBi	2dBi
VSWR	1.1	1.3 at 156.8MHz	1.2 at 156.8MHz	1.5 @ 156.8MHz	<1.5 @ resonance
DC grounded	yes	no	short circuit	yes	reads 10 ohms
Max power input	25W	50W	50W	25W	50W
Cable length	5m	9m	5m	3.7m	6m
Connection plug	PL259	PL259	PL259, BNC, TNC fast fit	PL259	PL259
Mount	Two rubber straps	2 x bungee with toggles	2 x Velcro straps	Rubber suction cup	Screw-mounted bracket
Storage	Waterproof tube	Waterproof PVC tube	Water-resistant tube	Weather-resistant tube	Waterproof container
Tube size: length x dia	310mm x 60mm	490mm x 50mm	310mm x 60mm	290mm x 60mm	260mm x 40mm
Warranty	2 years	Lifetime	3 years	2 years	3 years
Cost inc VAT	£39.95	£69.95	£78.55	£67.82	£68.95
Website	banten.it	Glomex.it	pacificairals.com	shakespeare-ce.com	shakespeare-ce.com
Distributor	Bainbridge Marine	Marathon Leisure	Bainbridge Marine	SMG Europe/Aquafax	SMG Europe/Aquafax

Results

We found that the Glomex AIS antenna didn't have the standard PL259 connecting plug required to connect to the main radio set, so this was our first object lesson. If you have an AIS antenna and want to deploy it as a main VHF radio antenna, check its connector and, if necessary, have an adaptor on board. The other thing we found interesting was that transmission from the emergency antennas was better than their ability to receive. In our test at 4NM, the reception from all the emergency

antennas was either very good (Pacific) or good (the remainder), so their transmission range was greater than their reception range. In theory, the transmission and reception strengths should be the same. The difference was probably due to electronic equipment, including the engine on *Trinity Star*, creating background noise which affected their reception. Another factor was the position of the emergency antenna. We found that having some boat superstructure between the emergency antenna and the other (masthead) antenna predictably weakened the signal.

Make	Reception quality		Transmission quality
	2.5 miles	4 miles	4 miles
Banten	Good	Nothing discernible	Good
Glomex	Good	Weak	Good
Pacific Seamaster	Very good	Good	Very good
Shakespeare 5911 Classic	Good	Unintelligible	Good
VTronix Shorelink	Weak	Unintelligible	Good

Mounting options

There are various options for mounting an emergency antenna. The easiest and quickest would be to hold it by hand, raising it as high as possible. Alternatively, it could be attached to a spinnaker pole or boat hook to give it increased height, limited by the length of cable supplied. With a mast still intact, but with a broken main antenna, it could be strapped to a halyard. Either way, the higher the better. With a handheld antenna, just standing up could double the range. See the RNLI site for a range calculator: <http://compleateguide.rnli.org/vhf-radios>

PBO verdict

For offshore sailing in particular, carrying an emergency antenna makes sense. It adds to the arsenal of safety equipment on board, especially if the emergency antenna can be raised above deck height – the higher the better for greater range.

Our test conditions looked pretty favourable for VHF radio wave transmission: it was a warm, sunny day. However, moisture content in the air absorbs energy and thus reduces transmission range. It is

possible that warm weather could have created humidity from surface evaporation, which hindered our transmission strength.

The test illustrated the importance of placing the antenna as high as possible, both to increase range and to ensure there was no part of the boat obstructing the transmission: however, the height would be limited by the length of cable provided. The Glomex had the longest at 9m.

As a comparison, at our four-mile range we tried using

the handheld VHF on board *Trinity Star*. Surprisingly, it performed just as well in transmission despite operating at 5W (compared with the 25W used with the emergency antennas) and marginally better in reception, probably because it was held clear of any superstructure. This suggests that the most compelling reason to use one of these emergency antennas is to take advantage of its ability to be hoisted aloft to increase range.

The antennas which made use of the storage container

to mount the antenna, the Glomex and VTronix, were considered the easiest to lash to a suitable attachment point. The test demonstrated that the telescopic whip antenna of the Pacific performed the best on test and therefore gets the Best Buy award, although we did have reservations about the robustness of the telescopic whip.

■ Thanks to Alan Watson for providing his Nelson 42 and his technical support for this test.

