

Send A Fast And Effective SOS: 2 Simple DIY Techniques

Some of you are surely thinking, "Cache is writing about kites ... he's lost it for sure this time!"

But don't give up reading because you might miss some lifesaving tricks. There are environments where the traditional 'last mile' signal devices are less effective.

Briefly:

- Traditional 'last mile' signals can be impossible to see through a forest canopy or in a small watercraft in rough seas.
- Kites are easy to make from supplies you probably have in your survival kit.
- MRE heaters are a source of hydrogen gas and can be used to turn a lightweight bivy sack into a signal balloon.

Disclaimer – Like many survival projects, this one can be dangerous. Specifically, it involves pointy objects, MRE heaters (scalding hot water), and hydrogen gas, which is both caustic and explosive. So, if you decide to construct the balloon, please use sound judgement and keep it away from any sources of flame. So, sorry ... no smoking. And do not mix the hot-air and hydrogen balloon designs or you may pay dearly for the oversight.

Jungle, Tropical and Coastal Rainforest Environments

On my last trip to Brazil, I noticed that many traditional "last mile" visual signaling devices, such as signal mirrors, would not have worked well under the jungle canopy even if you

climbed a tree or managed to find a clearing. Climbing a hill would be about your only shot with a mirror, but there are multiple problems with that.

First, you cannot see hills and mountains easily in dense jungle, so you do not know if you are walking up a hill or a mountain. Second, traveling uphill contravenes traditional survival wisdom unless you have a working radio.

Lastly, even if you are successful, unless you are signaling to aircraft or someone who is somehow not underneath the canopy, nobody will be able to see your signals!

Maritime Environment

Last spring, I had the privilege of interviewing Jose Salvador Alvarenga, who survived adrift at sea for an incredible 428 days. Salvador drifted from the west coast of Mexico to the Marshall Islands, North of Australia.

During his drift, he saw many container ships as he drifted through shipping lanes, but with only a mirror, he could not attract their attention. On one maddening occasion, he was close enough to see them fishing off the back of the container vessel and he tried to get their attention, but they just waved, kept on fishing, and motored right on by.

Visual signals do not work well in rough seas where rafts and small boats that lack a tall mast or superstructures are only momentarily visible as they crest a wave and then disappear back into a trough.

Another issue with the craft that is low to the water is that the distance at which they fall below the horizon is much shorter than it would be for a taller craft.

In a maritime environment, a kite or balloon flying high above your raft could be seen at far greater distances, which is a key advantage when you are trying to be found and communicate

that you are in distress in the vast expanse of the ocean.

In any case, when lost at sea, constructing a radar reflector and getting it up as high as you can is time and resources well spent since so many vessels have radar. If you do not have a radar reflector, one can be constructed by creating three slotted, Mylar-covered wire or cardboard frames, one for each dimension, and assembling them to radiate from a central point along each axis.

Kites

A kite flown in the middle of nowhere is going to create the same curiosity factor as a balloon and one that is signal orange is immediately identifiable as a distress signal. Write SOS on it in large, contrasting letters and your message will be clear.

About all, you could do from here is to add some retroreflective or IR-reflective tape to it or a small strobe such as an APALS. Just keep in mind that a wet string could conduct electricity from a lightning strike. All you need is a breeze and someone to see the kite and you are in business.

A kite can be flown for many hours and is reusable and field-repairable.

How to Build a Kite

Building a kite is easy.

How to build a kite

① gather supplies



- wooden dowels
- fabric or paper
- string
- scissors
- tape or thread

②



cut notches into
ends of both dowels



③

place smaller
dowel on top of
larger dowel. use
string to tie together

④



thread the string
through all the
notches, creating
a diamond shape.

⑤

cut your paper or fabric
big slightly larger than
the kite frame.



⑥

fold the paper or
fabric over the string
frame, and either tape
or sew it down.



⑦

reinforce
with tape
and punch
a hole.



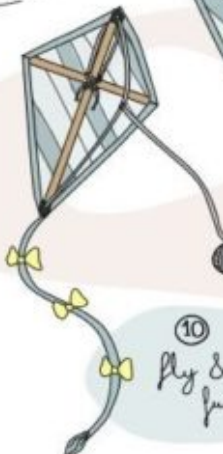
⑧

tie string from
top to bottom
then attach
flying string
1/3 of the
way down



⑨

attach a tail with
ribbons & bows.
the tail will help
stabilize the kite.



⑩

fly & have
fun!

- Form a lower-case letter 't' with two lightweight sticks or similar suitable material. The central stick or spine should be $1/5^{\text{th}}$ longer than the cross-member. Lash them together securely in the 't'-shape.
- Run cordage between the members to create the characteristic 'diamond' shape of a kite, notching the ends of the sticks so the thread stays put.
- Lay the kite shape on a signal orange emergency blanket and draw a diamond shape a couple of inches larger than the kite in each direction.
- Fold the sides around the frame and secure them with 100 MPH tape so that the blanket is taught on the frame.
- Attach a line to the intersection of the two sticks. Poke a small hole in the material and pass the line through the hole. The line should match the length of the crossmember. Run thread from the top and both sides of the 't' to the tip of that string. This point is where the line will be attached.
- Cut a strip of fabric or Mylar for the tail that is 6x that length of the spine. Feed the tail between the fabric and spine at the bottom of the kite and tie it at the mid-point forming a double tail. If all you have is Mylar and the tail is too light, add length and tie bows in it to create more drag.
- Write 'SOS' on the kite in bold, block letters.
- Attach the line.

Supplies Useful for Building a Kite

I am going to stick to supplies carried in survival kits or which can likely be procured from the environment.

Signal Orange Emergency Blanket – I prefer to carry aluminized polyethylene emergency blankets because Mylar is noisier and more fragile, but this is an application where Mylar may be superior since it is extremely lightweight. If you do not have

an emergency blanket, a lightweight trash bag or emergency poncho would probably also work.

Two Lightweight Sticks – To form the frame of the kite.

Kevlar Thread, 60-80 Lbs Test – This will be used to tie the kite to the framework and as a kite line. I carry Olive Kevlar thread in this test range because it is so multiuse, but an inner nylon strand of paracord would work as well. Unfortunately, a long length of paracord takes up more space than survivalists are willing to commit to a pocket survival kit, so you may have to tie multiple inner strands together if paracord is what you prefer to carry.

Sharpie Mini – A sharpie mini is small but can draw large block letters with little effort and the felt tip is easier on the paper-thin material the kite is made of.

Knife or Scissors – To cut the fabric, string, sticks, and tail and notch the sticks.

100 MPH Tape – To secure the fabric to itself when stretched tight across the frame.

Balloons

Unless you are in a part of the world that floats balloons in the middle of nowhere, balloons can be effective signals. Sure, they are not effective in windy weather, but kites are as long as the wind is not blowing too hard and anything out of the ordinary draws curiosity ... especially out in the middle of nowhere.

I have stumbled upon a couple of crashed balloons in my adventures. They turned out to have been lifted by school kids, but even on the ground, on both occasions, the reflective Mylar caught my eye and made me curious enough to hike out to them and send the tags back to the kids.

I imagine they were surprised

Surface-to-Air Recovery System (STARS) and Skyhook

Balloons and the military have a long and storied history. From artillery observation balloons to signaling balloons to surface-to-air recovery systems.

One of my mentors in survival was Lt. Colonel Charles 'Chuck' Jurgensen who served with 1st SFOD Delta (Delta Force). I imagine he was also a CIA operative, judging by where he was and details of some of the many war stories he related to me over the years, but he never suggested that he worked for the CIA.

The man operated in some far-flung parts of the world and did some crazy things and one of them was using a surface to the air recovery system.

The system was called the Fulton Surface-To-Air Recovery System (STARS) in development and named Skyhook once it was ready for operational use and sounds like something right out of a James Bond film. In fact, Skyhook was featured in *Thunderball*, *The Green Berets*, and *Black Knight*.

A rescue package is airdropped to the operator, who dons a harness and sends a line up into the air on a helium balloon. Then a specially-outfitted C-130 with a V-shaped yoke on the front of the plane snags the line which is anchored to the plane and fed into a winch.

The cargo, in case Chuck, attached to the line, is yanked up into the air and reeled into the back of the aircraft as it flies over. It takes 5-6 minutes to reel you in as you are dragged through the air behind the plane at 125mph. Chuck said it was a wild ride.

Well, his actual words were more along the lines of, “You couldn’t have driven a toothpick up my @\$\$ with a sledge hammer!”

Commercial Products

BCB – I have seen a couple of commercial signaling balloons over the years. One is the commercially-available BCB product called the Location Marker Balloon (LMB). The LMB was designed for military operations in jungle terrain and weighs less than 2 pounds, which seems heavy for a balloon, but that is military gear for you.

This may be hard for some of my younger readers to appreciate, but it is nice to have signal devices that do not rely on batteries. The balloon is over a meter across and is radar reflective. It is inflated with an included helium cylinder and can carry chemical light sticks, of which two are included.

The LMB can be seen from 10 miles and is visible at night if IR chemlights and night vision goggles are used. Since it floats above the jungle canopy, it should not be visible to enemy ground forces without the aid of air support. The balloon can also lift a radio antenna of up to 80 grams above the canopy.

Rescue Me Balloon – It appears a company is trying to bring a product to market that incorporates a signal strobe called the Rescue Me Balloon, but I see that crowdfunding attempts have not been successful yet. Perhaps they will be for sale in the future.

Field Expedient Signal Balloons

When I was a kid, I built a balloon out of a paper plate, some birthday candles, pins, string, and tape.

Even though I launched in Arizona, where it can be difficult to get a lift with only hot air, it gained altitude to about double the height of the power lines and made a little over half a block distance before it crashed into a power line, caught fire and fell into a neighbor's yard ... not necessarily in that order.

While the design we affectionately named the 'Hindenburg' was not a success on all accounts, it definitely attracted some attention, which is the point of signaling. You could build this design if that is all you had materials for, but I am going to test another design that will hopefully be more reusable and stay aloft a lot longer.

I intend to use materials I carry in my survival kit, like the kite design, so I'll see if I can't fill an orange bivvy sack with hydrogen gas. To generate the hydrogen, I'll use MRE heaters.

If I can manage to capture the hydrogen without capturing too much water vapor, it should float, but we'll see. In theory, it should work because a single MRE heater can put out up to 10 liters of hydrogen. I have never heard of anyone attempting this, but I would like to put it to the test.

Survival is the king of all DIY pursuits so there is only one way to find out.

Signal balloons should be tethered so they can indicate your location. An improvised balloon may not indicate your location for a long time, but many solutions to survival problems are less than ideal, but still end up getting the job done.

Survival Kit Supplies Useful for Building an Improvised Signal

Balloon

Signal Orange Bivvy Sack

Candles – Heat source. Some folks carry ‘trick’ wind-resistant birthday candles in survival kits. I carry small candles that are only slightly larger than birthday candles and made of beeswax, which has many survival-related uses.

I also carry a multi-wick candle in a tin in cold weather, which I will use to heat the air inside the bag before launch. This way, the smaller candles only need to keep the air hot. I will experiment with heating the air and reusing the balloon versus sending up a heat source.

Aluminum Sheeting– Aluminum foil will serve as a lightweight basket to carry the candles which will be our heat source. I carry thick aluminum sheeting to fold into a pot, use as a reflector, and many other uses, but will use heavy-duty aluminum foil here since it is cheaper and lighter.

Leader Wire – A loop of thin wire or light grass may be useful to hold the wall of the balloon away from the heat source. I carry 60 Lbs test, 7-strand, stainless steel, knot-able, coated leader wire, but any lightweight wire that can hold a shape would work.

Kevlar Thread, 60-80 Lbs Test – This will be used as a guy line to guide the balloon past branches and suspend the basket from the balloon.

Sharpie Mini – As noted under kites.

100 MPH Tape – 100 MPH tape will attach threads to the balloon to suspend the basket.

Paper – Include a note on water-resistant paper and include the date, your position, name, and contact information. Balloons are typically a one-shot deal and sometimes are not

found for a long time, so you would not want to trigger a search long after you have been found or recovered yourself on your own if the guy line breaks or gets burned through.

MRE Heaters – Helium is not the only lighter than air gas out there and since MRE heaters produce hydrogen gas and I carry one in my survival kit for a number of reasons, I will see how many I would need to float a balloon.

Surgical Tubing – As predicted, not only was steam was a problem, but so was the heat generated by the MRE Heaters, so I had to capture the hydrogen in a drum liner attached to the bivvy with surgical tubing, which I pinched off until the contents of the trash bag was sufficiently cool that the water vapor condensed back into the water, after which, I un-pinched the tubing and transferred the gas.

I used Aluminum foil to protect the drum liner from the MRE heaters and to introduce the water to the MRE heaters without any gas escaping, I sealed an MRE hot beverage bag inside the drum liner and introduced the water after evacuating the air and sealing everything uptight!

I carry surgical tubing to access water in crevices, attach it to my pen to make a bellows tube so I don't inhale smoke when stoking my fire, to propel my fling spear, to drive otter boards, as a backup tourniquet, pressure dressing, and many other uses.

Drum Liner – See above. Common survival kit item with near-unlimited uses.

MRE Hot Beverage Bag – See above. I modify MRE hot beverage bags with 100 MPH tape and grommets and use them for treating water by various methods, carrying water, as waterproof wound dressings, floats, bobbers, hot water bottles, and much more.

Aluminum Foil – See above or and in the section on kites.