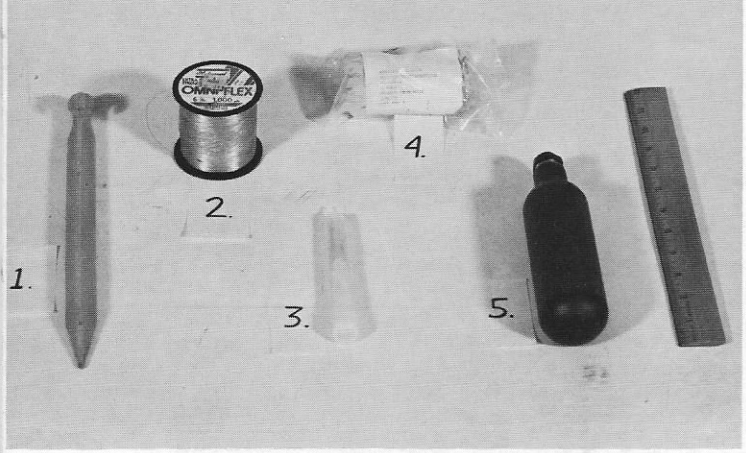
LTC John G. Heslin
photographs by SP4 Mark G. Crummett

Consider the Balloon

WITH THE INTRODUCTION and proliferation of effective antiair weapon systems on the modern battlefield, we have been forced to habitually operate in the nap-of-the-earth (NOE) environment. The challenge of low level navigation is well documented and the nemesis of many rotary wing aviators. Many of us have carefully planned our flight to ensure successful mission accomplishment defined in terms of en route survival and termination at the appointed place, at the appointed time. However, execution has often caused many an anxious moment

The white balloon (inset) is clearly visible when the background is green trees; but against the cloudy sky, the red balloon (top left) is more conspicuous



Materials used to inflate and deploy balloons:

(1) tent peg
(2) monofilament fishing line
(3) chemical lightstick
(4) balloon
(5) Air Force helium cylinder

as we weave in and out of the terrain environment, constantly checking our position against our planned route. As we approach our landing zones (LZ), a certain tightness increases until we get "contact" with our intended point of landing. This sensation is usually more pronounced during periods of reduced visibility, especially at night. Relief is almost instantaneous when some set of eyes within the aircraft makes "contact" with the LZ.

To ensure contact is made, we have several visual references which can aid us; examples are colored smoke, panels and sometimes flares or strobe lights. The problem with the visual references we now use is that they are far less effective for aircraft operating at treetop level. Panels cannot usually be seen until the aircraft is in the immediate proximity of the LZ. Smoke can be very imprecise as it drifts through the trees or is blown by the wind. In addition, smoke may become very visible to the enemy as it climbs into the air. Neither of these visual references is effective at night. Flares can best be seen at night; however, if fired they usually do not mark their origin clearly and may be observed for some distance by the enemy as they arch high above the LZ. Ground flares or strobe lights are often masked by the vegetation and not observed by the approaching aircraft.

Radio beacons are very effective; however, the electronic emissions are easily detected and their source pinpointed by enemy forces. Also, nondirectional radio beacons are not as readily available.

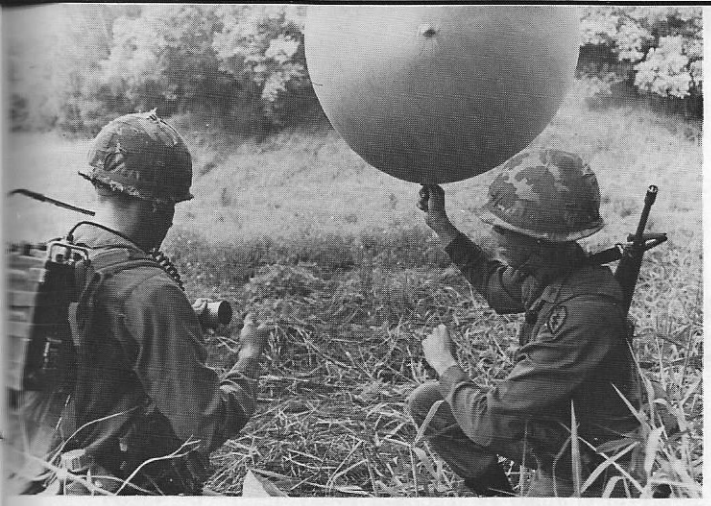
An alternative visual reference system may be developed using helium-filled balloons on a tether. Some exploratory testing and training have been conducted by C Troop, 3d Squadron, 4th Cavalry, 25th Infantry Division, Western Command, HI. Balloons and helium were obtained from the 25th Infantry Division, Division Artillery Headquarters, Metro/Radar Section. The meteorological balloons were red, white and black; however, only red and white were used for the test. Fully inflated, they are about 24 inches in diameter. Locally purchased 6-pound test monofilament fishing line and plastic tent pegs were used for the tether. The Metro Section provided some heavy twine; however, in the interest of safety, the lighter line was used and it proved satisfactory. The balloons secured by light monofilament line present a minimal safety hazard to the aircraft.

Helium for inflation was provided by a large cylinder weighing about 60 pounds. Although this is adequate for preliminary tests, a small container such as a CO_2 type cartridge would be necessary for tactical application. The Air Force Weather Detachment at Wheeler Air Force Base, HI, provided a sample of a lightweight portable container they used. The Coast Guard also has similar helium containers.

The day portion of the test was conducted using a single UH-1H Huey and two Soldiers (19Ds) from the recon platoon of C Troop. The team was inserted in a small LZ known as "LZ Depression" located at the northern end of the Kahuku Training Area. During the test, winds were 15 to 20 knots and there were intermittent rain showers through the area. The team members, Sergeant Russell Grant and Specialist Four Donald Jensen, did not have any difficulty inflating and deploying the balloons in the LZ. However, one balloon pulled free from the ground and was lost; another was destroyed when the wind pushed it into the trees. After making adjustments for these problems, the Soldiers were able to position and secure the remaining balloons without further difficulty.

Several NOE approaches were made with white and red balloons deployed to mark the LZ. The white balloon was easily observed and clearly visible when the background was green trees. However, when the balloons were skylined, the red one was more conspicuous. The pilots, Chief Warrant Officer, CW2, David Currie and Captain Bryan Fluke, stated that the balloons greatly facilitated locating the LZ. From the NOE altitude, the LZ was completely masked by the surrounding trees. When observed from a higher altitude, the white balloon could be seen for several kilometers. The balloons could be quickly recovered or easily cut free in the event of detection.

Initial night testing was conducted by the C Troop commander, Major Jim Wiggin during marginal weather conditions of intermittent rain showers. A white balloon with a 30-minute, high-intensity, cyalume light-stick was used. These lightsticks are locally purchased for about $2.50 each and are included as part of the survival equipment for aviators in Hawaii. The Division Artillery Metro Section also has a small white light, about 59¢ each, which can be used with the weather balloons. The lightstick was activated and inserted in the balloon. The balloon had the appearance of a



Soldiers of the recon platoon releasing the line and anchoring at selected height; releasing additional red and white captive balloons at various heights

glowing globe which could be observed drifting above the trees by the aircraft crew. The light from the balloon was not so intense as a light suspended beneath it. In fact, if more light were required to be observed from an extended distance, several lightsticks could be hung in series; however, the balloon would have to be inflated more in order to lift the additional weight. An interesting point here is that the greenish light from the lightstick was not easily detected by the use of night vision goggles. A white light would be more easily detected. It was also found that the lightstick does not significantly degrade night vision. These lightsticks may prove useful for other tactical lighting requirements such as constructing a "Y" or marking parking spots.

Initial indications are that the helium balloons provide an effective day/night visual reference system to support helicopter operations in the NOE environment. The Cavalry Squadron, 25th Infantry Division, intends to continue testing with an air toward possibly integrating the system into normal training.

One word of caution is offered here. Should one of the balloons with a lightstick in it break free, you are likely to have a large number of UFO sightings reported in that area.

Alternative applications for the balloon for both training and combat seem limited only by imagination and initiative. It has been suggested that scout aircraft could use them to mark flight routes, PRs, etc., for a follow-on air assault operating NOE. In a training environment where aerial gunnery is often limited to the same old expensively emplaced targets, one might consider using an array of balloons dropped in the impact area. This would provide a rapidly changing target display which would be challenging to engage and inexpensive to employ.

The visual references used in training will be the ones used in combat. Selection of the most appropriate reference commensurate with terrain, weather, enemy and the mission will be made based on availability. What is suggested here is that the choice be expanded by a different application of items already available in the supply system in order to enhance combat effectiveness.

ABOUT THE AUTHOR

Lieutenant Colonel John G. Heslin is the Aviation Officer for Headquarters, United States Army Western Command, Ft. Shafter, HI. He received a bachelor's degree from Providence College and a master's degree from the University of Rhode Island, and is a graduate of the Command and Staff Course, Naval War College. He has served in various aviation command and staff positions in the Continental United States and Vietnam.