Tan Tran

Two hundred years ago a Frenchman named Louis-Sébastien Lenormand demonstrated for the first time what we know today as the Parachute. Exactly 120 years later the Wright Brothers took flight in the world's first powered aircraft. Barely sixty years later Neil Armstrong successfully set foot on the moon. It may stand to reason that with the great technological leaps forward in aviation that parachutes have fallen into irrelevance. Despite this, parachutes continue to play a crucial role in the US Navy and Marine Corps to this day.

From the very early days to the present there have been few changes as to the core function of parachutes. Their primary purpose is to slow the rate of descent of an attached object. Parachutes slow an object's rate of descent by creating increased drag via air resistance. The higher the force of drag is the slower the rate of descent. This is because there is more force acting against the force of gravity. Guided by these fundamental principles, parachutes can come in many different shapes and designs. One of the earliest designs was the round parachute. As implied by the name these parachutes were perfectly circular. These parachutes were unsteerable and prone to oscillation making them less than ideal. The next type of parachute falls into a subset of round parachutes. Known as Cruciform parachutes, these parachutes are slightly squarer than round parachutes to reduce instability from oscillation. Both parachutes see use in static line jumping as their tendency to descend straight down helps to reduce midair collisions. The final major type of parachute is called a ram-air parachute. These parachutes are generally rectangular in shape and feature tubular "ribs" which inflate during a jump. These ribs together form an airfoil not dissimilar to that of an airplane wing which allows ram-air parachutes to be steered.

While many of the basic features and functions of parachutes remain the same, recent advances in material sciences can allow for better and more advanced parachutes to be created in the near future. In the past year, a team of engineers and researchers from a number of universities have managed to create a new ultralight material reportedly stronger than both steel and kevlar. The research that ultimately culminated in this carbon nanomaterial was funded by many different groups, among them the U.S. Office of Naval Research. Once able to be produced on a large scale this new nanomaterial could spearhead massive improvements in parachute design. For one, the lightweight properties of the material would make parachutes (which are generally quite large) less cumbersome to bear. In addition to being lightweight, the added strength of the material opens the door to many possibilities. Load-bearing cargo parachutes could benefit from the strength as they typically must withstand extreme forces upon opening. These parachutes which are used to drop up to a ton of cargo are made from various materials including nylon and Kevlar, both of which the new nanomaterial could be set to replace. Another potential application of this material in parachutes is PPG or Powered Paragliding. These ultralight aircraft are typically used for recreation but have merit as short-ranged reconnaissance aircraft. Up until today there has been limited use for these aircraft due to the fact that they can only be launched from the ground. The parachutes used for PPG flights cannot be both light enough and strong enough to withstand the forces involved during the opening of a potential air launch. Both of these weaknesses associated with PPG parachutes can be remedied by a parachute made of the new carbon nanomaterial. Such a parachute would allow for operators of air launched PPG aircraft to far exceed the ranges of even the best ram-air parachutes.

There is no question that parachutes from the day of their creation were destined to be intricately intertwined with the world of aviation. Given this importance, it is all the more important for the world of naval aviation to advance parachute technology as much as possible. The new carbon nanomaterial may just be a key to unlocking a new revolutionary breakthrough. In the future may allow for airborne insertion of naval special warfare operators, allow for unspeakable cargo loads, or perhaps could just make for a nice airshow along the lines of the Navy Leap Frogs. Either way the possibilities are endless.