



## *A CAP Aerospace Education Moment*

Did you know?

Among the many innovations that came into being during World War II, was something called Marston mat. This was a system of building a landing field practically anywhere using perforated or pierced steel planks. Each steel plank was 10 feet long and 15 inches wide (some sources say 16 inches wide) and  $\frac{1}{4}$  inch thick. It weighed about 66 pounds. Each plank had three rows of 29 holes for a total of 87 holes per plank. The edges of the holes were flanged in order to improve the strength of the plank and to allow for drainage. Also for drainage and to improve structural strength, there were U-shaped channels between the rows of holes. Two men could easily carry one or two planks. The planks had slots and L-shaped hooks on their long edges.

The method of building a runway was to first survey the desired direction that the runway was supposed to go, then mark it by driving stakes into the ground. Road-grading equipment could then smooth it out. In a pinch, however, the Marston mat could be laid directly on relatively smooth ground or on top of straw or other soft material to smooth out the bumps. The mats were laid on the ground so that the hooks of one went into the slots of the adjacent mat. The mats were also staggered somewhat like courses of bricks or floorboards so they wouldn't come apart too easily. Spring clips were inserted into the slots after the mats were joined to keep them from sliding back and forth against each other.

Before the U.S. entered World War II, a huge training exercise was held in North Carolina. The Army engineers built a 3000 foot runway in 11 days using 18 railroad carloads of this new product. General Henry (Hap) Arnold, who observed the exercise, thought that the Marston mat was the its greatest achievement.

Marston mat was used extensively in the Pacific Theater during World War II. As islands were captured, it became necessary to build landing fields quickly to carry on air operations. It was also relatively easy to repair if hit by a bomb. At Guadalcanal they devised a system that enabled 100 men to repair the damage caused by a 500 pound bomb in about 40 minutes. They determined that about 1600 square feet of Marston mat would do the job. They stored bundles of that amount in shelters alongside the runway. When a bomb exploded, repair crews would go out and clear away the damage. Trucks loaded with sand and gravel would pull up and fill the hole caused by the bomb. This would be tamped down and new Marston mat put into place making the runway serviceable again. It was thought that the success of the Pacific campaign owed a lot to Marston mat which helped support the island-hopping strategy.

The use of Marston mat was not limited to the Pacific. It was used wherever a runway was needed in a hurry. It was used in Alaska, Hawaii, Greenland, Italy, France, and other places wherever the U.S. went during WW II. The use of jets and helicopters, both of which kick up a lot of debris, and very heavy aircraft has made Marston mat obsolete for runways. However there are many subsidiary uses for it and vendors are still selling the product today.

See also: [https://www.youtube.com/watch?v=c\\_heqdlC7B4](https://www.youtube.com/watch?v=c_heqdlC7B4) for a video