



Georgia-Pacific

**ON TOP OF THE WORLD**—Mountain climbing workmen stand at the top of this giant gypsum concrete dome being completed for the Carborundum Co., Niagara Falls, N.Y. Extending 300 feet in diameter, its peak rises 100 feet on a 20-foot base to cover an extensive, completely post free area. Technicians from Georgia-Pacific Corp., Portland assisted in building the challenging roof deck.

MILITARY SCIENCE

## 'Copter Rescues 'Copter

► **THE MOST AVID** collector in Viet Nam is the Sikorsky Skycrane, which is known for gathering all sorts of things such as downed aircraft, heavy weapons that need moving and almost any other object that cannot be handled any other way.

More than 100 aircraft have been retrieved by the four Skycranes belonging to the Army's new First Cavalry Division (Airmobile). Most common rescuee is the speedy "Huey," officially known as the UH-1B. The Huey is the most active fighting helicopter in the war, and as a result has comprised more than 60 of the Skycranes' recoveries.

Another helicopter that owes a debt to the Cranes is the CH-47 Chinook, which at 16,000 pounds, is beyond help from any other rescue vehicle.

The Skycrane, in fact, may be the strongest helicopter for its weight in the world. Empty weight is 17,240 pounds, but it can lift more than 20,000 pounds—equivalent to a 170-pound man lifting 200-pound barbells.

In contrast, the Sikorsky S-61N, used

in this country for ferry service between such nearby points as San Francisco and Oakland, weighs 12,256 pounds, almost twice the amount it is capable of lifting.

Fixed-wing aircraft also have had reason to be grateful to the Skycrane. Fighters such as the A1E Skyraider and A4E Skyhawk, as well as transports like the eight-plus-ton C-47, have been recovered intact from the places where enemy fire or mechanical ills forced them down. Even a DeHavilland CV-2 Caribou, which weighs more than 14 tons, was carried out, though it had to be moved in two sections.

Heavy artillery such as 14,000-pound, 155-millimeter batteries have been moved from hilltop to hilltop, as have their ammunition and crews.

Complete field hospitals can be transported by the Skycrane, built into a boxcar-like structure that fits snugly between the helicopter's spidery legs. A mobile command post unit has also been ferried about in the same kind of enclosure.

Though the Skycranes have cost the Army almost \$2 million apiece compared with \$850,000 for the S-61N "stateside ferry," the Army is far from unhappy. They will reportedly double the number now in service in Viet Nam by the end of the year, and acquisition of still more is being negotiated.

TECHNOLOGY

## Global Navigation Net Three-Eighths Ready

► **NORWAY, Trinidad** and the Hawaiian Islands are separated by thousands of miles, yet they have something in common—in fact, it is because of their spread around the globe that they are the locations of the first operating links in a worldwide U.S. Naval navigation net.

Five more fixed stations will be installed, the earliest of them to be at an undisclosed location in "the U.S. Midwest." Both Naval and Coast Guard ships are serving as bases for the eight seagoing receiving stations now being used to perfect the system.

Another receiver is being used at a Navy training school so that upcoming officers will be able to use the equipment even before it is fully operational. A tenth is being tested by the manufacturer, Northrop Northronics, in Needham, Mass.

Each station in the network, called Omega, transmits two radio pulses at different frequencies (10.2 and 13.6 kilocycles). The pulses are transmitted sequentially, each station producing its two pulses at assigned times during a 10-second interval.

The shipboard receivers compare the time differences between any three or more signals. A series of numbers are automatically displayed, equivalent to lines drawn on a map from the ship to each of the transmitters.

The reason Omega can be used over such long distances (up to 6,000 miles) is that its signals are VLF (Very Low Frequency) waves. Because of the way VLF signals bounce off layers of the atmosphere, Omega's signals have been used successfully in all kinds of weather, and can even penetrate seawater and ice—a boon to nuclear submarines which owe their effectiveness to their ability to remain submerged for months or years at a time.

Omega's predecessors are two LORAN (Long Range Navigation) systems, one of which requires 80 stations to cover 30% of the Northern Hemisphere, while the other uses fewer (25) stations for a larger area (35% of the Northern Hemisphere).

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