Getting a grip on space

Talon Hook puts GPS in downed aircrew hands

Photo by 30th Audiovisual Squadron

Aircrew members take cover as an MH-53J Pave Low helicopter descends to pluck them from behind simulated enemy lines in July during Special Project Eidolon Lance on Guam. Talon Hook equipment guided the chopper directly to the scene, letting rescuers extract the aircrew in less than 30 seconds.

By SSgt. George Hayward
Air Force Space Command Public Affairs

It's not quite Star Trek, but it will save lives.

Remember how Capt. Kirk never needed to give his coordinates when Scotty beamed him out of Klingon clutches? It seems his communicator did it for him. He needed only to say, "Beam me up," and his communicator told the transporter where to aim.

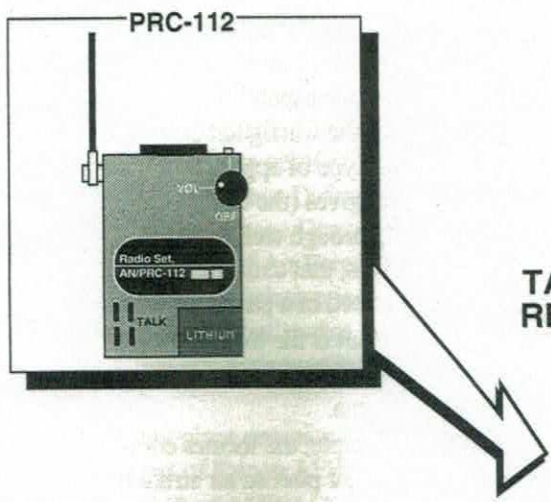
The Air Force doesn't have transporters (yet), but an innovative Air Force Space Command program is using the Global Positioning System to pinpoint and pluck downed aircrews from behind enemy lines, just like Kirk's communicator.

Talon Hook, one of several command Talon programs that give warfighters new uses for space systems, mates tiny GPS receivers to PRC-112 emergency radios used by downed aircrews. This combination, called a GPS-112, uses communications satellites and GPS to let a downed pilot, as well as the search and rescue team, know where he is, where he needs to go and, perhaps most importantly, even where the enemy is. And it does this without the pilot or search team ever speaking to each other.

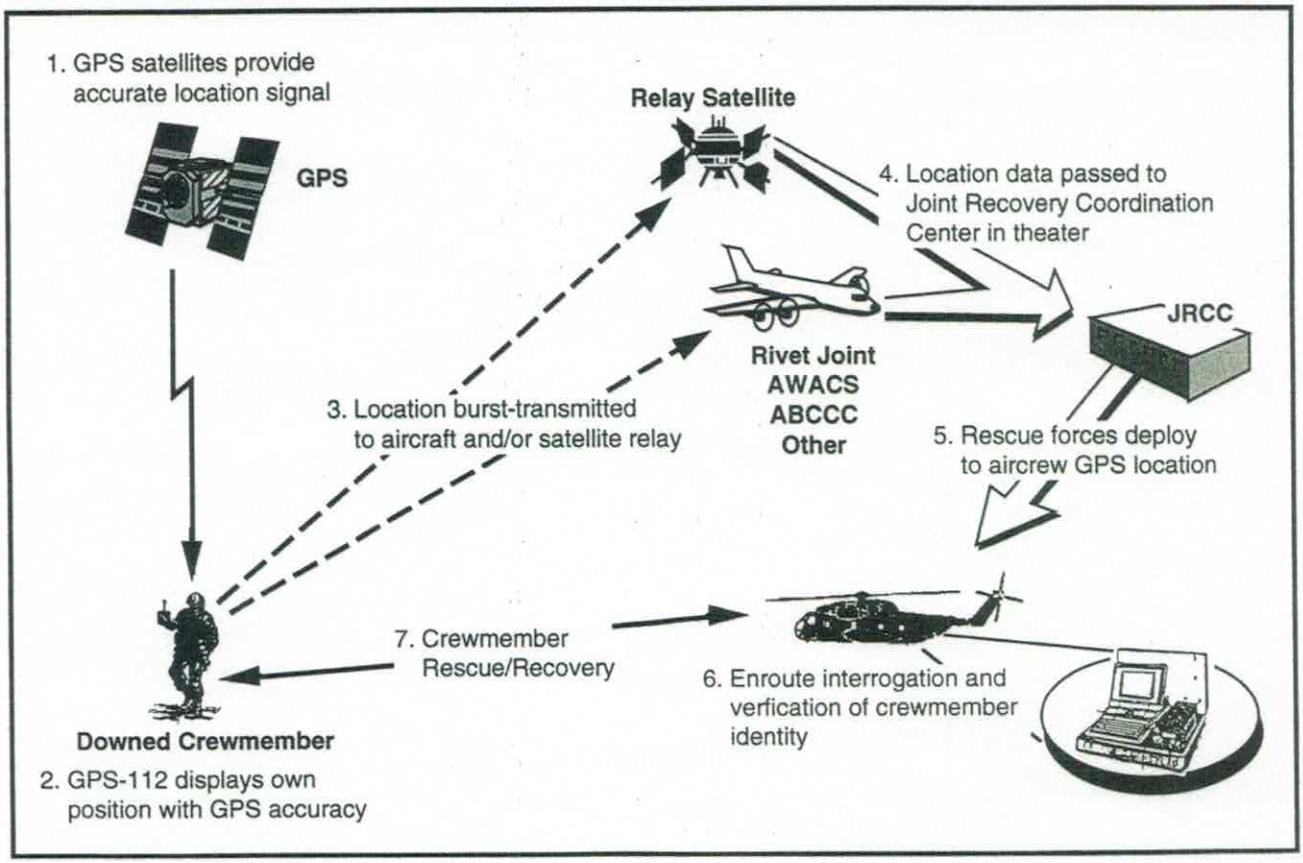
"The Talon Hook system can improve the survivability of our forces simply by the time it takes to get accurate location from this device with the field unit all the way through the system to ... whatever rescue forces are going to do the extraction," said Capt. Ed Loxterkamp, Talon Hook project officer.

Without the GPS connection, a downed aviator uses the PRC-112 to talk to search and rescue forces, who often fly for hours before finding the aviator. At the same time, enemy forces may also be searching for the aviator, listening to his radio transmissions to also locate him. This not only increases their chances of capturing the aviator, but also puts the search and rescue team at greater risk of coming under fire.

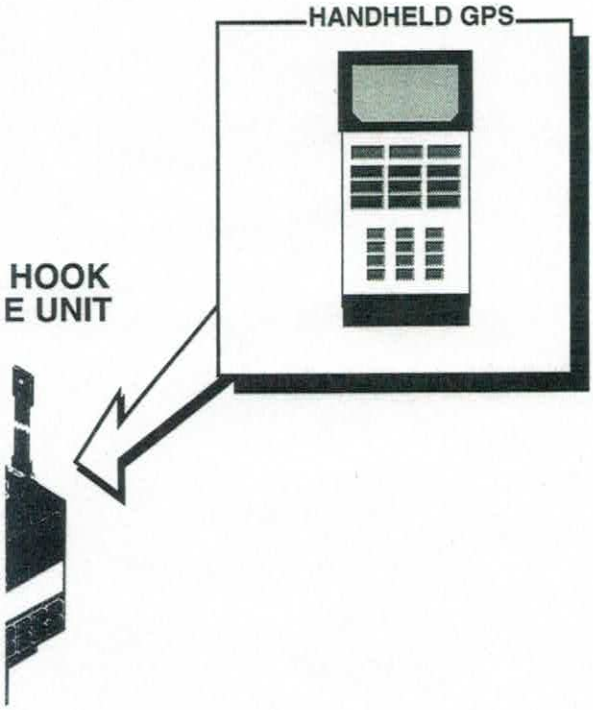
With the GPS-112, the aviator can



How Talon Hook works



send his location to rescue teams via satellite with one short electronic signal that is nearly impossible to detect or trace.



The unit also allows two-way, non-voice signaling between the aviator and rescuers. For instance, the rescuers can pull location readings from the aviator's radio if the aviator is incapacitated. They also can send the aviator directions on where to go to avoid enemy forces or facilitate rescue.

The system, still under development, received its first field tests during the recent Tandem Thrust exercise in the Pacific Ocean. Rescue teams searched for GPS-112-equipped aircrews "downed" behind enemy lines or at sea.

Loxterkamp said rescuers were able to pinpoint the aircrews location and even follow their movements while en route to the scene. When the rescue team arrived, they knew exactly where to go to extract the aircrew. No hours-long visual searches or extensive voice communications were necessary.

The tests let Loxterkamp ensure the GPS-112 met the many varied operational needs of its aircrew users, features he terms "buttonology."

"The quantum leap in technology that's being presented to the individual evader is just potentially fantastic," said Capt. Ed Pernotto, an HC-130 navigator who participated in the exercise. He called Talon Hook "one of the largest breakthroughs in combat rescue ... in decades."

Loxterkamp said such feedback was universal among exercise participants. But they also pointed out many improvements that could be added if future funds are available.