

Flying Blind in Iraq: U.S. Helicopters Navigate Real Desert Storms

Seething clouds of dust and sand make for tough landings--and frequent crashes--in the deserts of Iraq and Afghanistan. The American military's response? Point, click and simulate.



Photographs courtesy of Applied Minds, Inc.

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POPULARMECHANICS.COM, October 3, 2006 — Squinting against the scorching, 150 mph tornado tearing through the BlackHawk's open windows, I can see the ground unit about a mile off the bird's nose. Five Humvees, all gun trucks, their turrets sprouting machine guns, are strung along the road below us. We're flying flat-out, 300 feet off the desert floor.

I'm on a month-long embed last year with the Army's 50th Medical Company (101st Airborne Division, Air Assault)—the BlackHawk medevac crew known as "Eagle Dustoff" that I chronicled in the October 2005 issue of Popular Mechanics. We're rushing to an urgent Medevac call 20 miles northwest of Baghdad, and now—less than a mile out—we know the landing will be trouble.

The PZ (pickup zone) is a desolate stretch of desert punctuated only by a strip of road. There aren't villages for miles, and no signs of life other than the occasional scrub brush and a few stunted bushes. This scorched earth, with no crops, buildings or pavement to hold it down, is the perfect setup for one of a helicopter pilot's many worst nightmares: a brown out. As the helo descends, its powerful rotor wash kicks up sand, dust and debris, churning it into a blinding cloud of brown, cutting visibility to zero and completely obscuring any unfriendly

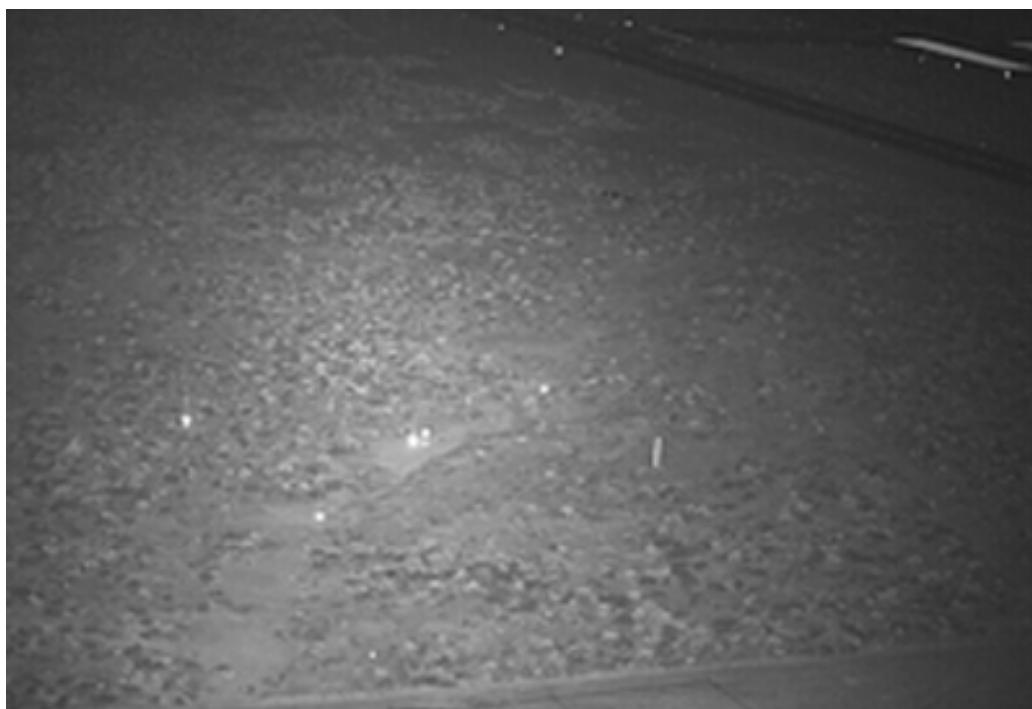
obstacles that might be waiting in the landing zone.

The problem is pervasive in arid climates like Iraq's. The Air Force Special Operations Command (AFSOC) has seen a recent spike in accident rates—brown outs have been a “significant factor” in one-third of their serious aircraft accidents since 2000—as the \$100-million-a-year headache affects all branches of the military. The U.S. Army, which flies most of the choppers in Iraq, blames the brown-out effect for three out of every four accidents there and in Afghanistan.

We're about 75 feet off the ground and 150 feet from the Humvees when the BlackHawk's rotors kick up dust and sand. “Call the dust,” pilot Scott Brown orders over the headset to his crew chief and medic. Both are hanging out the windows, peering back at the cloud boiling up quickly behind us and calling: “Dust at the tail wheel!” “Dust at the cargo door!” “Dust at the landing gear!” “Dust at the cockpit door!” Brown gently sets the BlackHawk down in a roll-on landing as the seething cloud billows over the bird. Our own mini-sandstorm is so thick and dark that we sit for 30 seconds until it settles enough for Brown to release his crew.

This landing ended safely, but just a few weeks later some of the same crew crashed during a brown-out that broke the back of their BlackHawk and left them stranded in downtown Baghdad.

And while conditions in Iraq are bad, battle-tested crews say they're far from the worst. The dust in Afghanistan is so fine that it flows like a fluid and routinely engulfs helicopters—especially during special-ops landings, which often take place in 0/0 conditions (zero ceiling/ zero visibility). Maj. Mike Grub, an MH-53 pilot with AFSOC calls Afghanistan the “scariest environment imaginable,” and former MH-53 gunner Paul Bratcher estimates that the theater's conditions give it a “pucker factor of 12.”



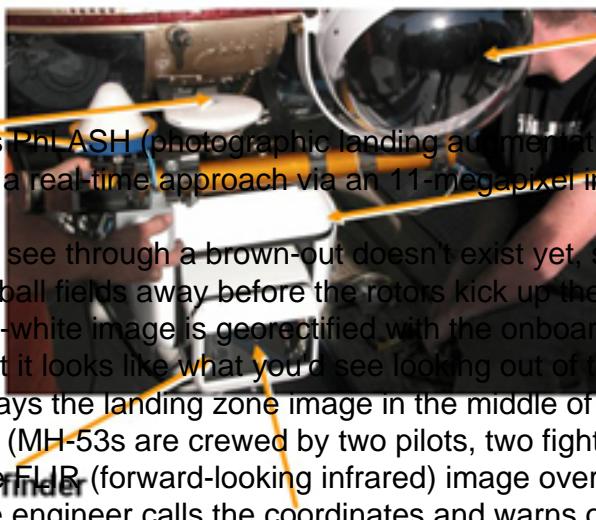
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A typical image taken by PhLASH, 200 feet above the desert floor and 1,000 feet from the landing zone.



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PhLASH's 11-megapixel digital camera starts taking pictures from as far as two football fields away, but its high-powered zoom essentially puts the helo pilot on the ground.



The solution is PhLASH (photographic landing augmentation system), a glorified point-and-click that simulates a real-time approach via an 11-megapixel infrared digital camera mounted off the nose of the MH-53.

Technology to see through a brown-out doesn't exist yet, so PhLASH takes a picture of the landing zone from as far as two football fields away before the rotors kick up the dust and sand using a high-intensity I.R. flashbulb. The black-and-white image is georectified with the onboard global positioning system, then "zoomed and panned so that it looks like what you'd see looking out of the cockpit," Grub says.

PhLASH displays the landing zone image in the middle of the cockpit's instrument panel directly in front of the flight engineer (MH-53s are crewed by two pilots, two fight engineers and two gunners). During landing, the pilot focuses on the FLIR (forward-looking infrared) image overlaid on top of flight information (altitude, airspeed, etc.), while the engineer calls the coordinates and warns of any obscured obstacles.

"It's like flying an instrument approach to hover through the brown out," Grub says.

[Click to enlarge](#) The Air Force developed PhLASH through its Air Force Research Laboratory's Rapid Reaction team and has successfully tested it on a commercial helicopter, with an MH-53 test set for December. If all goes well, the plan is to deploy the system as quickly as possible—though the Air Force isn't sure how many choppers it will equip with the system at a price tag of approximately \$150,000 apiece.



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The PhLASH system mounted on a MH-53 Pave Low Helicopter, which will test the device in December.