INCREASING RELIANCE ON SPACE SYSTEMS IN COMBAT

The space systems acquired by SMC's predecessors during the 1970s and 1980s made significant contributions to the success of Operation Desert Storm, when United Nations forces led by the United States liberated Kuwait in 1991 after the 1990 Iraqi invasion. It was the first major test of space support for a large military campaign. Once enough ground terminals were brought into the region, DSCS provided 84 percent of the super-high-frequency, long-haul, intertheater communications required for operations, and it supplied much of the short-range, intratheater communications as well. The GPS Program Office made emergency buys of critically needed Small Lightweight GPS Receivers (SLGRs). The various kinds of GPS user equipment greatly increased the American advantage during Desert Storm by helping ground troops navigate through the featureless desert, helping naval vessels map mine fields and maneuver through them, and by helping Air Force and Navy aircraft navigate to their targets and deliver their weapons more accurately. The DMSP Program Office deployed existing weather terminals and quickly procured a new terminal—the Rapid Deployment Imagery Terminal (RDIT)—to support American forces in the Persian Gulf. DMSP provided commanders with high resolution, near real time weather information that was an important part of planning air and ground operations. Finally, DSP played a significant role during Operation Desert Storm, when it detected short-range Scud missiles that Iraq fired at targets in Israel and Saudi Arabia.

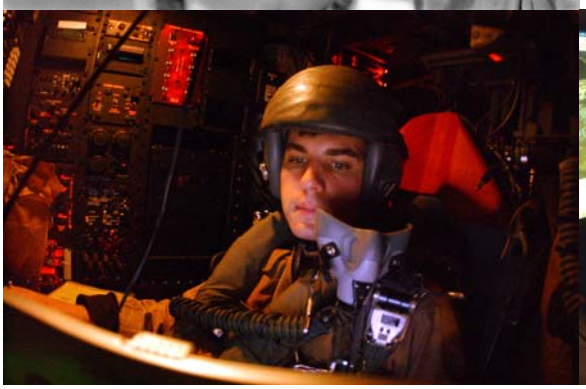
Above left: An American soldier holds one of the Small Lightweight GPS Receivers (SLGRs) used during Operation Desert Storm. Above right: An artist's concept depicts a DMSP Rapid Deployment Imagery Terminal (RDIT) used during Operation Desert Storm.

In 1999, the North Atlantic Treaty Organization launched Operation Allied Force to stop the ethnic cleansing campaign in Kosovo that was being conducted by the Yugoslavian armed forces directed by President Slobodan Milosevic. NATO, with U.S. Air Force units as its largest component, conducted air strikes against Serbian targets rather than launching a traditional military campaign with massed ground forces. Air Force space systems played a vital role in this unique air war. The satellites acquired by SMC provided more information faster and more accurately than they had during Operation Desert Storm. GPS had attained full operational capability in 1993, when it completed its

24-satellite constellation. Therefore it was available 24 hours a day. During Desert Storm, only nine percent of the Allied munitions had been GPS-guided "smart" bombs, but in Operation Allied Force, the majority of the munitions were smart bombs that hit targets with remarkable precision. They played an important part in efforts to avoid civilian casualties and collateral damage from NATO's air attacks. DMSP meteorological information was used to predict and exploit the frequently bad weather over Yugoslavia. The high quality of DMSP's cloud imagery and forecasts allowed strike planners to more confidently identify targets for precision weapons. Images from surveillance satellites were one of the most important sources of data in choosing targets and in assessing damage after they were attacked. DSCS and Milstar satellites provided the most important medium of communications for both aircraft and NATO commanders during the campaign. After a 78-day campaign, Milosevic capitulated and agreed to NATO's peace terms. Operation Allied Force proved that, if the conditions are right, a war can be won using primarily air power and space support.

The United States launched Operation Enduring Freedom in October 2001 against the Taliban regime in Afghanistan, which harbored Osama bin Laden and his Al Qaeda terrorist organization. Members of that organization had carried out terrorist attacks on 11 September 2001 against the World Trade Center in New York and the Pentagon. Air Force space systems provided information even more accurately and rapidly than they had during Operation Allied Force. Initially, small groups of elite American military units were deployed to Afghanistan to support the anti-Taliban Afghan fighters. These Americans carried 2.75-pound Precision Lightweight GPS Receivers (PLGRs) and satellite-based communication devices that they used to pinpoint enemy targets and call

Left: A U.S. Marine prepares for combat in Operation Enduring Freedom by checking out a commercial GPS unit. (U.S. Marine Corps photograph)
Below left: A B-52 navigator plots a course over Iraq in April 2003 using GPS user equipment. (U.S. Air Force photograph)
Below right: An Air Force operator works with satellite weather images at a tactical terminal in Iraq in March 2003. (U.S. Air Force photograph)



in devastating air strikes against them. GPS-guided munitions struck with great accuracy and reduced the number of air sorties needed to destroy a target. The advanced DSCS, upgraded Milstar, and evolving GBS space systems provided American forces with a variety of improved high-speed, long-range communications. The quantity of intelligence and data relayed from space was unprecedented. DMSP provided meteorological information in support of the air campaign, and it also supported ground troops, who had to endure harsh regional weather. The Taliban regime was overthrown in early 2002, and Al Qaeda lost its base of operations and scattered. During Operation Enduring Freedom, Air Force space systems provided an indispensable support system that was always accepted, valued, and used by American forces in the air, on the ground, and at strategic headquarters.

Operation Iraqi Freedom began with an invasion of Iraq on 19 March 2003 by a coalition of American, British, and Australian Forces planning to end the regime of Saddam Hussein. The operation was still in progress at the time this history was written, but it seemed clear that space-based systems would provide even greater precision, speed, and other economies of force than they had during earlier military operations. Lieutenant General Brian A. Arnold, SMC's commander, described the contributions of space systems to improvements in the timeliness of weapons delivery by saying that the average time involved in identifying and hitting a target had been about a day during Operation Desert Storm, about 45 minutes during Operation Enduring Freedom, and about 11 minutes during Operation Iraqi Freedom. He added that future improvements could come by downloading data—GPS positioning data, for example—directly from space systems into munitions.[1] Clearly, Air Force space systems had not only contributed to an American military advantage, they were on the verge of creating radical changes in the prosecution of war.

[1] Richard Tuttle, "New Tactics: Fast-paced Technology In the Air and On the Ground Opens Doors in Iraqi Freedom," Aviation Week and Space Technology, 9 June 2003.