PATHFINDER
AIR POWER DEVELOPMENT CENTRE BULLETIN

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PRECISION – THE COMING OF AGE OF AIR POWER

Strike capabilities of air power took a hard knock during the Vietnam War, when the 'high-tech juggernaut' that was the US Air Force could not avoid humiliation by a low-tech opponent. During this war, a number of technology-led innovations dramatically increased the effectiveness of aerial strikes, none more prominently than the so-called 'smart bomb'. Although portrayed as some sort of a 'magic weapon', and the answer to all problems of accuracy in air attacks, there was really nothing very complicated about them.

As early as mid-1945 American scientists were working on a number of guided-bomb projects. In fact, other than for laser and navigational satellites, every other means that would eventually be used to guide weapons was already being trialed. Radio-steered bombs were successfully used in Burma and subsequently in Korea, both times to destroy bridges that were vital to enemy operations. However, with the nuclear standoff that developed immediately after the Korean War, the need for precision to be measured in dozens of feet was pushed to the background.

Although laser-guidance was stunningly effective in the Vietnam War, the necessary budgetary approval to progress further was not forthcoming. The Paveway series of bombs, of which the American forces dropped 28 000 in Vietnam, cost only US $8000 a-piece but were as effective as 25 unguided bombs of equivalent weight. The most famous success of Paveways was the destruction of the Thanh Hoa bridge, which carried the only railroad and principal highway across the Song Ma River south of Hanoi. After 871 sorties had already flown against the bridge, with 11 aircraft lost but no tangible damage done, on 13 May 1972, 14 fighters carrying 2000 and 3000-pound Paveways attacked and destroyed it completely.

The overall success rate of the Paveways was very close to a one bomb–one kill ratio, and also permitted attacks on targets that were off-limits for fear of collateral damage and repercussions. For the first time, precision capability nullified what had from the earliest days of the concept of strategic bombing been its most profound limitation: the public opinion backlash of unintended civilian casualties. Even then the revolutionary implications of precision guidance were lost in the realignment of political forces and the review of defence and foreign policies that saw the curtailment of the development of advanced conventional weapons systems.

During the 1970s and 80s, 80-90 per cent of budgets were spent on developing higher quality aircraft and only the remainder used for weapons research. The potential of advanced weapons was readily apparent to only a few people who appreciated that precision guidance meant that an aircraft would have to make fewer passes over heavily defended targets, and also that weapon release could be accomplished from greater distances and altitudes, keeping the aircraft out of harms way. In the early 1980s it was calculated that 100 fighters carrying precision weapons could destroy as many as 800 tanks per day, more than ten times the number that could be achieved by a force of 2500 World War II bombers. Fortunately, several new developments reinvigorated research into precision weapons.

Results of area attack, Germany 1945

The foremost impetus was Soviet numerical superiority in the European theatre that seemed to assure a 'nuclear escalation' if there was a conflict, since NATO forces would be forced to use tactical nuclear weapons to stop the Soviet advance, and hence risk provoking nuclear retaliation. The NATO doctrine that emerged incorporated conventional tactical air strikes into Army doctrine as never before. The F-117 stealth fighter was

the result of this rethinking and, in the words of RAND analyst Benjamin Lambeth, in retrospect it proved to be 'one of the most pivotal contributions of the 1980s to the revolution in lethality and effectiveness of American air power'.

Two other technological developments underscored the connection between precision strike and accurate intelligence for targeting. One was the introduction of the Low Altitude Navigation and Targeting Infra-Red by Night (LANTIRN) external pods that gave fighter aircraft the capability to autonomously carry out precision attacks at night. The other was the testing of an ambitious concept to locate real-time targets in the battlefield, the prototype of which system was named JSTARS. Throughout the 1980s these two projects were strapped for resources so that on the eve of the 1991 Gulf War there were only two prototype JSTARS and a handful of LANTIRN pods in the USAF inventory.

The First Gulf War demonstrated vividly and graphically the new meaning that technology gave to the concept of precision. The image of a precision-guided weapon plunging down the airshaft of a government building in Baghdad, impacting precisely in the crosshairs of an infra-red targeting system, became emblematic of air power. Precision guidance made it possible to destroy 41 of the 54 road and rail bridges between Baghdad and Kuwait in just 450 sorties and brought about the almost complete destruction of the Iraqi military (at the start of the conflict, numerically the world's fourth largest).

Precision attack in the Gulf War changed the perceptions and reality of air strikes. It made air power the weapon of choice not only to prepare the battlefield for the ground advance, but to destroy more than 50 per cent of the enemy's equipment. Although the victory for air power in this campaign was unprecedented, thereby exorcising the ghosts of Vietnam, it also made the task of air power even harder by creating an incredibly high expectation of perfection in its strike capabilities.

There was also the worry in air force circles that the abnormally low casualty rate would once again put air power into unsavoury situations with higher than deliverable expectations. This worry seemed to be coming true in the peculiar air war that was fought over Serbia in 1999. Although, in the end, the effect required—the capitulation of Milosevic—was achieved with minimal civilian casualties, the use of air power in this campaign was less than optimum. From a purely precision attack perspective, however, the campaign once again proved the new capabilities brought on by a new generation of guided weapons. The Joint Direct Attack Munition (JDAM) had a 30-foot accuracy, had a steering system that was launch-and-leave and could be fed target coordinates up to moments before release, and had all-weather day and night capability.

Targeting with a PGM

The combination of such precise weaponry with real-time targeting capability provides air power with the ability now to conduct a new kind of warfare in which it can locate engage and destroy enemy ground forces across the entire spectrum of operations. Tactical application of such awesome power has also kept pace with capabilities and thereby increased the efficacy of air power. Douhet and Mitchell had predicted that air power would eradicate entire battle fronts: their prophecy has indeed come true. Air power had always to bear the brunt of ridicule for the passion with which advocates predicted its capabilities while its actuality fell short. New technologies in precision guidance and information dissemination have finally laid to rest these objections.

Strategic air attack is wasted if it is dissipated piecemeal in sporadic attacks between which the enemy has an opportunity to readjust defences or recuperate.

– General Henry H. Arnold, USAF, 1948

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