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Patriot launch unit from Alpha Battery, 2nd Battalion, 7th Air Defense Artillery, outside King Abdul Aziz Royal Saudi Air Base, Dhahran, Saudi Arabia. The photograph was taken on 18 January 1991 after the launch unit had been rearmed. The previous night this launcher conducted the first successful engagement of a Scud missile in the Gulf War. (XVIII Airborne Corps photograph by Private First Class John F. Freund)

AFTERMATH

The emergence of Patriot as an instrument of U.S. Foreign Policy

by Major Terence M. Dorn

"Send in the Marines," was once America's typical response to virtually any foreign crisis; today, the United States is more likely to "send in the Patriot battalions." The Gulf War, with its salvos of Scud missiles, took Air Defense Artillery out of the rear echelon of Army doctrinal and strategic thought and placed it in the vanguard of Army Force XXI. At the same time, it made Patriot a powerful instrument of foreign policy comparable, in many ways, to an aircraft carrier battle group. This may seem an extravagant claim, but it's a claim supported by an assessment of Patriot's performance during Operation Desert Storm and its aftermath.

General H. Norman Schwarzkopf credited Patriot's performance during Operation Desert Storm for holding together the fragile Gulf War coalition. "When the history of Desert Storm is written," he proclaimed, "the Patriot system will be singled out as the key." After the war, some critics complained that the Army had grossly exaggerated Patriot's tactical effectiveness, but no one cast doubts on the system's strategic effectiveness.

Iraqi based its strategy for defeating the Coalition forces during the Gulf War upon

experiences gained during the Iran-Iraq War, in which it relied on belts of carefully prepared and mutually supporting defensive positions to repel Iran's "human wave" assaults. During the Gulf War, Iraq built a massive, in-depth line of defensive positions supported by reinforcements and numerous obstacle belts designed to channel Coalition forces into prearranged kill zones. In discussing the concepts of the offense and defense, Carl von Clausewitz stated that "the defense should not be entirely immobile," it should "await the blow, but then parry the blow." The Iraqi forces were clearly well dug in along their defensive line and in their reinforcing positions. As a result, concern raged amongst Coalition planners about the Iraqi's ability to "parry the Coalition's blow."

Saddam Hussein predicted that American soldiers who attempted to breach the Iraqi defenses would "swim in a sea of blood." He believed that his defensive strategy and deployment of military fortifications would cause the conflict to drag on for, at least, months, in much the same manner as his previous war with Iran. He gambled that high casualty rates would weaken Coalition resolve and turn American public opinion against the war. Unfortunately for Iraq, his rationale was flawed in that he discounted a number of important considerations, especially the supremacy of Coalition air forces.

Saddam also attempted to escalate and alter the very nature of the conflict (using Clausewitzian terminology) by identifying and attacking what he believed to be the Coalition's center of gravity -- its tenuous political and military alliance. Saddam ordered his military to use its highly mobile Scud missile launchers based in the Western Zone of Operations to launch unprovoked missile attacks against what he believed to be the linchpin that could unravel the Coalition forces now arrayed against him - Israel. His strategy was simple enough, draw Israel into the conflict and drive a wedge between the United States and its Arab partners. Saddam believed that once Israel initiated retaliatory strikes, and thus became involved in the conflict, the Arab coalition would refuse to participate any further and the Coalition alliance would rapidly disintegrate.

In the months prior to the outbreak of hostilities, Saddam vowed that any attack upon Iraqi forces would be countered with an attack by Iraq upon Israel. When Saddam's simplistic attempt to deter a Coalition attack failed, it came as no surprise that he soon began firing Scud tactical ballistic missiles (TBMs) into Israel. His goal was to widen the conflict by drawing Israel into the fray, and to refocus attention from his invasion of Kuwait to a much wider conflict involving a united Arab front against Israel or possibly an Islamic conflict with the West.

The first Scuds fell on Tel Aviv and Haifa on January 17, 1991. Israel accepted the United State's immediate offer to send U.S. Patriot batteries. The 32nd Army Air Defense Command airlifted two 10th Air Defense Artillery Brigade batteries from Germany to Israel. These 4th Battalion, 43rd Air Defense Artillery, Patriot batteries began arriving at Tel Aviv's Ben Gurion Airport on January 19, barely a day after the air defenders received notification to deploy. The U.S. Patriot batteries joined two Israeli Patriot batteries, whose soldiers had been rushed home from training at Fort Bliss, Texas. Nearly simultaneously, a special C-141 Galaxy loaded with the newer and deadlier TBM-killing Patriot Advanced Capabilities-2 (PAC-2) missiles, along with corresponding software enhancements, touched down at Ben Gurion Airport.

The PAC-2 missiles were about to enter production when Iraq invaded Kuwait in August

1990. The first 11th Air Defense Artillery Brigade Patriot batteries that deployed to Saudi Arabia during Operation Desert Shield arrived with only a few PAC-2 missiles that were leftovers from the missile's test and evaluation program. Soon, workers at Martin Marietta (now Lockheed Martin) were working around the clock, and PAC-2 missiles began pouring off the assembly lines. Raytheon, the Patriot prime contractor, stepped up production of Patriot engagement control software, delivering several generations of software upgrades in time for Operation Desert Storm. Patriot commanders breathed easier as PAC-2 missile stockpiles grew and enhanced software improved the system's capabilities. These new missiles and enhanced software permitted Patriot batteries to successfully engage hostile TBMs and forever altered modern warfare.

In truth the Scud missile presented a much greater political hazard threat than a military threat. The Scud missiles that the Iraqi forces fired toward Israel were inherently unstable and highly inaccurate; their basic design flaws were further compounded as a result of Iraq's attempts to increase both the range and payloads of their inexpensive Soviet supplied missiles. Although ineffective militarily, the Scud missile attacks were of great strategic potency in that they allowed Iraq to maintain the psychological and political pressure on the United States, its allies and, certainly, Israel.

As wailing sirens announced the approach of incoming Scuds, the pressure on Israel to launch retaliatory air strikes grew almost irresistible. Coalition air forces diverted sorties from bombing missiles to search for Scud launch sites. Despite a great deal of military effort, none of the Scud mobile launchers were ever located, targeted and destroyed. It's failure to locate the Scud launchers will undoubtedly stand as the intelligence community's biggest failure of the conflict.



Patriot soldiers of the 1st Battalion, 7th Air Defense Artillery, board an Israel-bound C-5 transport plane at Rhein Main Air Base, Germany.

Since four Patriot batteries were not enough to defend Israel's sprawling urban areas, U.S. Army Europe and the 32nd Army Air Defense Command deployed two additional batteries from the 1st Battalion, 7th Air Defense Artillery, 94th Air Defense Artillery Brigade, to Haifa, Israel. The Netherlands dispatched a Patriot battery to defend Jerusalem. However, there would be one major problem with the Patriot deployment to Israel. The command and control apparatus, controlled by the Israeli Air Defense

Command, was not as effective as the U.S.-managed systems in Saudi Arabia. Neither trained nor familiar with the Patriot system, the Israeli commanders insisted that the Patriot crews operate under manual control verses the faster and optimally designed automatic procedures written into the system software. They also failed to position the Patriot fire units in optimal locations respective of the known Iraqi Scud launch areas.

Flawed command and control procedures, combined with software problems, resulted in multiple engagements of the same attacking Scud missile by Patriot interceptor missiles. The Scud's breakup and debris were often classified as new threats due to software difficulties, and the Patriot system would re-engage the "new targets." The first poorly managed intercept of an Iraqi Scud missile by multiple Patriot batteries involved the nearly simultaneous launching of more than 15 Patriot interceptors against one inbound target. With the Israeli government underwriting the cost of Patriot expenditures in the defense of their country, that first single Scud missile attack was unquestionably the most expensive missile engagement of the war.

Based upon detailed information provided by the U.S. Army before Congress, the overall success rate for Patriot was "greater than 60 percent." This figure, the Army said, is "the composite of a greater than 70 percent success rate in Saudi Arabia and more than 40 percent in Israel." In Saudi Arabia, not a single Scud damaged command, control, communications and intelligence centers, logistic complexes or airfields defended by Patriot batteries, although flight operations were suspended for a few minutes at Dhahran while debris from an intercepted Scud was swept from the runway. An Iraqi Scud that hit a warehouse that had been converted into a barracks killed 27 soldiers and wounded 100 others. It was easily the most telling blow that Iraq managed to deliver during the entire war, but the tragedy only reinforced Patriot's success by focusing the Army's attention on the requirement for more effective systems to defend the force and host population centers.



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From a strategic perspective, the Patriot system reduced the effectiveness of the Iraqi's most fearsome instrument of mass terror. Patriot denied Saddam Hussein his desire to drag Israel into the conflict, and as a result he was unable to break the multinational coalition arrayed against him and their political will to fight. "Patriot reduced the potential damage to civilian property and lives far below that which could have been expected without a TBM-capable defense," said Saudi Prince Bandar Bin Sultan Bin Abdulaziz in a post-war interview. "... I was there and the most beautiful sight in the world that I have ever seen in my life was that Patriot streaking across the capital of Saudi Arabia hitting those Scuds...." General (Ret.) Uri Ram, commander of the U.S. Patriot forces in Israel during the war, stated, "Patriot was a success, but it wasn't perfect... Patriot was of enormous strategic significance and helped save lives in Israel from Scud

attacks...." As part of the U.S. Army's testimony before Congress in April 1992, Congressman Horton (R-NY) summed up the testimony succinctly when he stated, "I believe Patriot's performance was superb and that it saved lives. I believe its psychological and actual impact on the enemy was immense."

"In the final analysis," wrote Frank N. Schubert and Theresa L. Kraus, general editors of *Whirlwind War*, "the Patriot missile made major contributions to the success of Operation Desert Storm. Though some allied tactical aircraft were diverted to hunt for the elusive mobile Scud launchers, the air phase stayed on track and on schedule in large part because the Patriots were able to deal with the Scuds, which were employed in a piecemeal fashion by an unimaginative enemy. The Patriot also helped keep preparation and execution of the land campaign on schedule by eliminating the need to divert maneuver units to the task of searching for mobile Scuds. In short, the Patriot reduced the Scud to a minor operational irritant. And last, Saddam Hussein's use of Scuds as a terror weapon to goad the Israelis into a reprisal that would possibly unravel the fragile coalition or to panic the Saudis and crush their will to resist came to naught. Overall, the Patriot blunted the foe's only truly effective offensive weapon."

Aftermath

Since the Gulf War, it has grown increasingly evident that the proliferation and development of weapons of mass destruction deliverable by TBMs or other airframes will soon render American foreign policy impotent unless we can erect an effective defensive shield. Fortunately, Air Defense Artillery is on the verge of fielding a near-leakproof, multi-tiered air and missile defense system of systems.

When Patriot air defense batteries rapidly deployed for Operation Desert Thunder in February, a new type of military organization, the 32nd Army Air and Missile Defense Command (AAMDC), deployed with them. As I write, 32nd AAMDC soldiers, commanded by Brigadier General Dennis Cavin and operating out of a fully automated tactical operations center, are orchestrating theater air and missile defense across a broad swath of Southwest Asia.

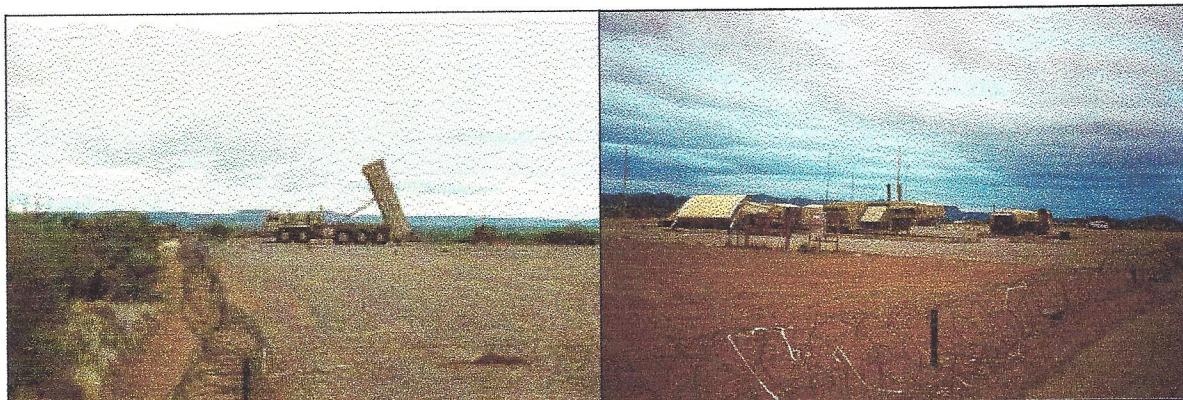
Although presently deployed, the 32nd AAMDC is not scheduled for activation until this fall. While it appears that the current crisis in the Persian Gulf has subsided, the 32nd AAMDC's deployment serves as a preview of things to come. By virtue of his rank and position, the 32nd AAMDC commanding general serves as the theater army air defense coordinator and simultaneously as the deputy area air defense commander, a subordinate position to the area air defense commander. The area air defense commander is the single commander designated by the joint forces commander with overall responsibility for air defense. During the Gulf War, this position was held by the Joint Forces Air Component commander, an Air Force three star.

The 32nd AAMDC owes its existence to lessons learned from the 1990-1991 Gulf War and the dramatic duel between Patriot and Scud missiles in the skies above Saudi Arabia and Israel. As Coalition forces assembled for Operation Desert Shield and began to expand across hundreds of miles of open desert, the need for an "overarching" theater missile and air defense command grew apparent. During the Gulf War, this position was filled by the commander of the 11th Air Defense Artillery Brigade, Colonel Joseph G. Garrett III. In any future conflict, U.S. Army air defense forces will eventually come under the

operational control of the Army air defense "one star," who commands the 32nd AAMDC. Therefore, the 32nd AAMDC represents a substantial increase in the Army's and Air Defense Artillery's position in the command and control apparatus hierarchy, but this is only one of the ways that Patriot and its performance during the 1990-1991 Gulf War have transformed Air Defense Artillery.

Today, the Army is rapidly fielding Patriot Advanced Capability-3 (PAC-3) upgrades, a time-phased series of system hardware and software upgrades designed to improve Patriot's performance against the evolving threat. The PAC-3 upgrade program will eventually provide an enhanced anti-tactical ballistic missile capability to all 10 of the Army's Patriot battalions. The upgrade includes improved electronic counter-counter measures and advanced, hit-to-kill, PAC-3 missiles. A Patriot launcher that can hold just four PAC-2 missiles can hold 16 PAC-3 missiles. Each Patriot battery will load two of its eight missile launchers with 16 eight ready-to-fire PAC-3 missiles apiece (a total of 32 PAC-3 missiles) while the remaining six launchers will carry four ready-to-fire PAC-2 missiles apiece (a total of 24 PAC-2 missiles.) The PAC-3 missiles will allow Patriot batteries to engage maneuvering and non-maneuvering TBMs, as well as cruise missiles and aircraft. The PAC-3 enhancements package will effectively double the engagement capability of the Patriot system against TBMs.

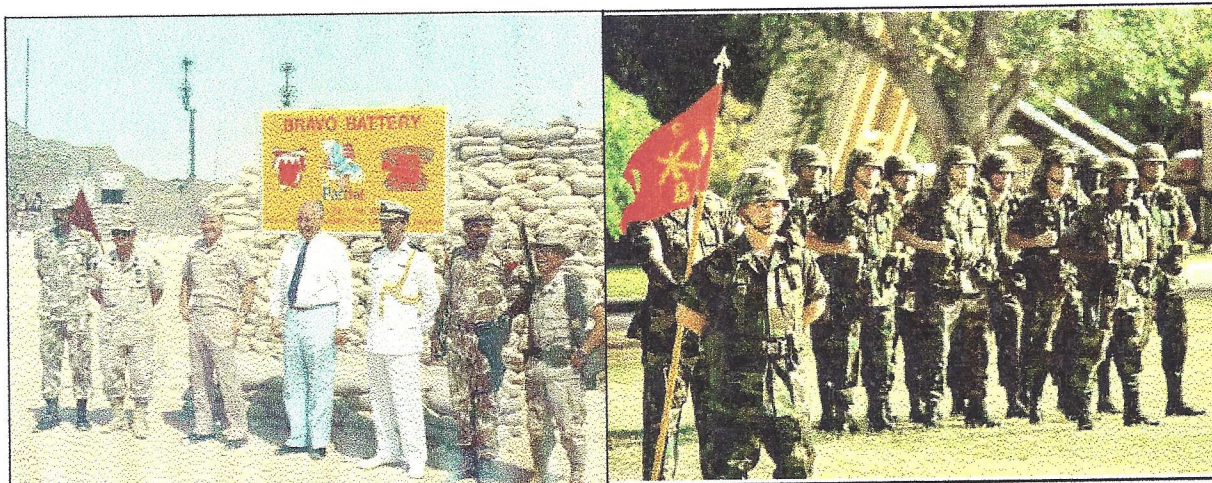
As a direct result of the Gulf War, the U.S. Congress recognized "an immediate need for a system capable of defending large areas" and cities against TBM attack. In 1991 the U.S. Congress passed the National Defense Act and the Defense Appropriations Act, both of which established a requirement for a "deployable demonstration system in order to provide a highly effective upper tier Theater Missile Defense (TMD) for U.S. forward deployed forces and those of its allies." It further directed that a mature system be available by the turn of the century



A THAAD launcher, left, and its fire control equipment, including the radar and prime power unit, are shown above. THAAD will serve as the upper-tier Theater Missile Defense system while Patriot and Medium Extended-Range Air Defense System will serve as complimentary lower-tier theater missile defense systems.

The Theater High-Altitude Area Defense (THAAD) system, sometimes referred to as a "Super Patriot" system, is an upper-tier system that was designed from the onset to function as an anti-tactical ballistic missile system. It is capable of conducting endoatmospheric and exoatmospheric (within and outside of the Earth's atmosphere) engagements of short and intermediate range theater-class ballistic missiles at much higher altitudes and further downrange from the targeted areas, thereby reducing damage due to debris or chemical agent fallout while guaranteeing multiple engagement

opportunities. Unlike the PAC-2 system, THAAD utilizes hit-to-kill interceptors which have been proven to provide "a much greater degree of lethality compared to interceptor missiles designed with fragmentary warheads." It will augment the lower-tier Patriot system and other planned systems such as the Medium Extended-Range Air Defense System to provide a "near leakproof" umbrella of critical theater assets. Much of the THAAD's operational capabilities is classified, but for comparison purposes it can protect an area more than 20 times larger than Patriot against TBM attack.



As commander of a Patriot battery deployed to Bahrain in July 1992, the author (second from left in the photo at left), hosted the Vice Chairman of the Joint Chiefs of Staff, Admiral David E. Jeremiah (center). At right, the author as commander of the THAAD User Operational Evaluation Battery during its activation at Fort Bliss, Texas.

As the commander of a Patriot fire unit deployed to Bahrain in July 1992, I had the pleasure of hosting a visit by the Vice Chairman of the Joint Chiefs of Staff, Admiral David E. Jeremiah. During the course of his visit, Admiral Jeremiah pulled me aside and commented on the fact that in his opinion, "Patriot was now more important than aircraft carriers in signaling U.S. resolve and intention." According to Admiral Jeremiah, as soon as the current crisis had erupted, the first question asked at the Joint Chiefs of Staff level, was "how soon can we can send Patriot units?"

More than any other weapon in the Army and rivaled only by the Navy's super carriers, Patriot is a well known, active player in the international community and, as such, an effective political tool for U.S. foreign policy objectives, resolve, and posturing. Unlike threatening super carriers, Patriot is strictly a defensive weapon system. For the immediate future, Air Defense Artillery's political influence on the tactical, operational, and strategic realms of warfare will only continue to grow as technological advances to Patriot and subsequent "spin-off" weapon systems, namely THAAD, are fielded.

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