



Missile Defense Timeline

Early History of Missile Defense

8 Sep 44 The Missile Age began when the first German V-2 missile struck London.

1944/45 The Allies developed a plan to use timed anti-aircraft artillery barrages to defend London against incoming V-2 missiles. The plan was never implemented because of the damage that would have been caused when unexploded artillery shells fell back on the city.

1945/46 At the end of World War II, U.S. leaders learned of Nazi plans for an ICBM that would have been aimed at New York City had the war continued into 1946.

4 Jul 45 A delegation of American officers, which went to Europe to investigate the use of ballistic missiles during World War II, recommended that the U.S. undertake a research and development program to develop defenses against these new weapons.

Dec 45 A report by the Scientific Advisory Group of the U.S. Army Air Forces (forerunner of the U.S. Air Force) discussed the use of missiles and a form of energy beam to defend against missile attacks.

4 Mar 46 The Army Air Forces, precursor of the U.S. Air Force, initiated two long term studies, Projects Thumper and Wizard, that were to explore the feasibility of developing interceptor missiles that could destroy missiles moving as fast as 4,000 miles per hour at an altitude as high as 500,000 feet.

29 May 46 The Stilwell Board Report, which had been convened in November 1945 to determine what equipment U.S. ground forces would require following World War II, recommended the development of defenses against ballistic missiles. The report stated: "Guided missiles, winged or nonwinged, traveling at extreme altitudes and at velocities in excess of supersonic speed, are inevitable. Intercontinental ranges of over 3,000 miles and payload[s] sufficient to carry atomic explosive[s] are to be expected. Remotely controlled, and equipped with homing devices designed to be attracted to sound, metal, or heat, such missiles would be incapable of interception with any existing equipment such as fighter aircraft and antiaircraft fire. Guided interceptor missiles, dispatched in accordance with electronically computed data obtained from radar detection stations, will be required."

Sep 53 The prospect of ICMB developments prompted the seven marshals who had led Soviet efforts in World War II to ask the Central Committee of the Communist Party of the Soviet Union to investigate the possible development of an ABM system. In response to this request, a feasibility study was conducted and the determination reached that missile defenses were possible. This led the Soviets to initiate their ABM development program at the end of 1953.

1955 Using an analog computer, Bell Telephone Laboratories completed 50,000 simulated intercepts of ballistic missile targets. These simulations indicated that it was possible to hit a missile with another missile. Up to this point, a number of scientists said that it was impossible to intercept missiles because of their high speed. This, they said, would be like "hitting a bullet with another bullet."

16 Jan 58 Secretary of Defense Neil H. McElroy assigned primary responsibility for the ballistic missile defense mission to the U.S. Army, ordering the Air Force to scale back its Project Wizard and make the radar and command and control equipment from this project compatible with the Army's Nike Zeus ballistic missile defense system.

4 Mar 61 According to one report, the Soviets completed the first interception and destruction of a missile warhead. An official report described this intercept as follows: "The V-1000 antimissile was launched according to a computer command. The detonation of the antimissile's high-explosive fragmentation warhead was conducted at an altitude of 25 km according to a command from earth from a computer after which, based upon data from the film recorder, the ballistic missile warhead began to fall apart."

19 Jul 62 During a test over the Pacific Ocean, a Nike Zeus missile fired from the Army's Kwajalein test facility intercepted a dummy warhead from an Atlas ICBM. Although the Zeus only came within two kilometers of the warhead, this was close enough so that the nuclear warhead of a fully operational Zeus would have destroyed the ICBM warhead.

22 Dec 62 A Zeus missile came within 200 meters of a reentry vehicle during a simulated intercept over the Pacific Ocean.

10 Nov 66 Secretary of Defense Robert S. McNamara informed the American people that the Soviets were deploying their Galosh ballistic missile defense system.

23 Jun 67 At the Glassboro summit, President Lyndon Johnson and Secretary of Defense Robert McNamara tried to convince Soviet Premier Alexsei N. Kosygin that the Soviets should abandon their effort to deploy missile defenses, for the U.S. would merely have to add more nuclear warheads to its ICBM force to overcome these defenses. This elicited the following response from Kosygin: "Defense is moral; offense is immoral!"

18 Sep 67 Secretary of Defense Robert S. McNamara announced President Lyndon Johnson's decision to deploy the Sentinel ballistic missile defense system. This was to be a two-tiered defensive system that employed two interceptors: the Spartan and the Sprint, both of which were nuclear-tipped. The Spartan intercepted warheads and decoys outside the atmosphere. The Sprint intercepted warheads within the atmosphere where air resistance would strip away decoys and make it easier to find the attacking warheads. The system itself was designed to protect the U.S. from the so-called "Nth country threat," an attack by unsophisticated ICBMs such as those the People's Republic of China was building.

6 Feb 69 Secretary of Defense Melvin Laird halted the deployment of the Sentinel system pending the completion of a review of U.S. strategic programs by the new administration of President Richard Nixon.

14 Mar 69 President Richard Nixon announced his decision to deploy a missile defense system designed essentially to protect U.S. ICBM fields from attack by Soviet missiles. This system retained the same missiles that were to be deployed as part of the Johnson administration's Sentinel system. The re-oriented missile defense system was named Safeguard. The overall plan for Safeguard included the option to expand the system so that it could become a population defense against the

system was renamed Safeguard. The overall plan for Safeguard included the option to expand the system so that it could become a population defense against the "Nth country threat."

26 May 72 U.S. President Richard Nixon and Soviet General Secretary Leonid Brezhnev signed the SALT I agreements which include the ABM Treaty. This treaty limited the Soviets and the U.S. to the deployment of two ABM sites, each having 100 interceptors. One site was to guard an ICBM field, the other would protect the national command authorities at each nation's capital city. A 1974 protocol reduced the number of permitted sites to one.

1976 In view of technical limitations and the restrictions on missile defenses contained in the ABM Treaty, Congress ordered the Army to close down the Safeguard system, scarcely four months after it had become operational. The Soviets continued to maintain their own ABM system near Moscow.

6 Jan 84 Presidential National Security Decision Directive 119 established the Strategic Defense Initiative (SDI) to explore the possibility of developing missile defenses as an alternative means of deterring nuclear war. The technology plan developed by the Fletcher committee was to be the general guide for initiating this program. This directive also made the Secretary of Defense responsible for the new program. The emphasis in the program was to be on non-nuclear developments, although research work on defensive nuclear devices was to continue "as a hedge against a Soviet ABM breakout."

Missile Defense Test milestones (1984 to the present)

10 Jun 84 The core of the Army's new hit-to-kill interceptor technology was successfully demonstrated in the homing overlay experiment. In this demonstration, a test intercept vehicle was launched from Kwajalein Missile Range aboard a modified Minuteman rocket. Also riding on the Minuteman was an infrared sensor package and an on-board computer. The interceptor itself carried a computer and an infrared sensor package for guidance; it was also equipped with a kill device that resembled the folded skeleton of an umbrella with weights attached to its ribs. Once above the atmosphere, the sensor and computer in the Minuteman located and tracked a re-entry vehicle that had been launched from Vandenberg AFB by a second Minuteman missile. Then, the on-board computer of the launch rocket passed tracking data to the computer on the intercept vehicle. At the appropriate time, the interceptor package was launched and homed in on the target using its own infrared sensor and on-board computer. Once free of the mother ship, the kill vehicle deployed its umbrella structure, crashed into the target vehicle, and destroyed it. This successful intercept followed partial successes in two other test flights. Nov 87 Lowell Wood briefed General James Abrahamson on the interceptor concept that eventually became Brilliant Pebbles.

14 Jun 89 Based upon his administration's review of U.S. security requirements, President Bush concluded that the goals of the SDI program were generally sound and that the program should continue in such a way as to offer the possibility of a deployment decision in the next few years. Emphasis in this effort was to be directed toward perfecting boost-phase kill technologies such as Brilliant Pebbles. In support of these directions, Bush directed DOD to carry out an independent review of the SDI program and to have this review finished in the fall of 1989.

Summer 89 Four major studies of the Brilliant Pebbles concept were carried out, including a review by the JASONS. The general conclusion of these studies was that Brilliant Pebbles was a promising, technically feasible concept that could provide the solution to cost and vulnerability problems of the space-based elements of the Phase I Strategic Defense System architecture.

18 Jan 91 According to press reports, for the first time in history, an anti-missile missile intercepted and destroyed a ballistic missile under combat conditions. A Patriot air defense missile destroyed an Iraqi Scud missile that was attacking a U.S. air base in Saudi Arabia. The crew that fired the Patriot missile was led by First Lieutenant Charles McMurtrey of Montgomery, Alabama. The Patriot was launched against the Scud at 4:28 a.m. local time. A reporter for the Los Angeles Times wrote: "The age of 'Star Wars' had arrived."

28 Apr-6 May 91 At 7:33 AM EST on 28 April, the space shuttle Discovery blasted off from Cape Canaveral with several major SDIO experiments aboard. The launch, originally scheduled for 26 February, had been delayed because of a number of difficulties with the space shuttle. One of the more interesting facets of the experiments carried out on this mission was the shuttle's execution of a maneuver known as the "Malarkey Milkshake." This maneuver was part of an experiment that observed the firing of the shuttle's engines against various backgrounds, e.g., against the earth, against black space, against the earth's limb, etc. Planners for this experiment had expected to get a minimum of six views of the shuttle's engines firing and hoped for as many as twelve; they actually observed the firing engines seventeen times. The shuttle mission ended at 2:56 p.m. EDT on 6 May when the Discovery landed at Cape Canaveral.

13 May 93 Secretary of Defense Les Aspin announced that the Strategic Defense Initiative Organization was being redesignated the Ballistic Missile Defense Organization to reflect the new focus in DOD's missile defense program and the new way in which the program would be managed.

30 Nov 93 The Army carried out a successful test of the Extended Range Interceptor (ERINT) at the White Sands Missile Range in New Mexico. The ERINT collided with the warhead of a STORM target vehicle. This warhead contained a cluster of 38 pressurized, water-filled containers designed to simulate toxic chemical submunitions.

15 Feb 94 An Extended Range Interceptor (ERINT) hit a ballistic missile target vehicle in a test conducted at the White Sands Missile Range in New Mexico. The target was a nose cone carrying a simulated chemical warhead.

11 May 94 A Scud missile struck the North Yemen city of Sanaa at 1 a.m. today causing fifty-three casualties. As many as twenty-five of these people may have died.

Mar 96 The Peoples' Republic of China (PRC) fired four M-9 missiles that landed in the vicinity of Taiwan. These firings were part of military maneuvers designed to influence Taiwanese elections, which the PRC feared might harden Taiwanese resistance to re-union with mainland China.

24 Jan 97 A modified Standard Missile 2 Block IVA successfully intercepted and destroyed a Lance missile target at the White Sands Missile Range. This was the first successful intercept of a missile by the SM2. During the test, the interceptor successfully transitioned from radar guidance to its infrared guidance system prior to destroying the target with its blast fragmentation warhead. This successful test was one of the prerequisites for moving the Navy's Theater Wide missile defense system into the Engineering and Manufacturing Development stage of the defense acquisition process.

7 Feb 97 BMDO and the U.S. Army's Space and Strategic Defense Command carried out a test in which a Patriot Advanced Capability-2 (PAC-2) missile successfully intercepted a theater ballistic target missile. The target missile was fired from Bigen Island, Aur Atoll, toward the Kwajalein Atoll; the interceptor missile was fired from Meck Island in the Kwajalein Atoll and intercepted the target missile over the Pacific Ocean. A Patriot Guidance-Enhanced Missile was also fired at the target, but destroyed itself because the PAC-2 missile had already destroyed the target missile. The target missile had the characteristics of a variant of the Scud missile.

24 Jun 97 BMDO's Joint Program Office, in conjunction with the U.S. Army's National Missile Defense Program Office and the Air Force's 30th Space Wing, successfully completed the first flight test (IFT-1A) of "a candidate infrared sensor designed for possible use with the National Missile Defense (NMD) program." This sensor was produced by Boeing North America and employed a very "sensitive infrared silicon-based focal plane array." Another sensor developed by Hughes Aircraft will be tested later. In the test of 24 June, a specially configured Minuteman II rocket, fired from Vandenberg Air Force Base in California, lifted aloft a suite of test targets. This launch occurred twenty-one minutes before a payload launch vehicle sent the Boeing sensor package into space from Kwajalein Missile Range in the Republic of the Marshall Islands. The sensor package then flew by and "looked at" the test objects, collecting an extensive amount of data on the objects. Following the test of the Hughes sensor package that will occur later, both companies will integrate their sensors with hardware to develop a test exoatmospheric kill vehicles (EKV). These two EKV's will then be flown in actual intercept tests. Following these intercept tests, one of the EKV designs will be selected for an integrated NMD flight test in late 1999.

19 Aug 97 The fifth flight of the Arrow 2 anti-tactical ballistic missile was launched at 11:29 a.m. local time (4:29 EDT). The lift-off was normal, but the interceptor veered off course soon after launch and had to be destroyed for range safety purposes. The target missile was an Arrow 1 missile. The cause of the failure was isolated to the Electrical Actuator Driver (EAD). The EADs used in the test missiles were prototype models that had not heretofore been subjected to subsystem testing.

26 Sep 97 The Navy conducted a risk reduction missile flight test at the Pacific Missile Range Facility (PMRF) in Kauai, HI, using a modified SM-2 Block IV. The flight was declared a "NO TEST" because the missile did not complete second stage flight and the proper operation of the SM-2 Block IV second stage was not the focus of this test. The primary objective was to demonstrate missile flight stability during second/third stage separation and subsequent flight to extremely high altitude. The missile did not enter the upper atmosphere as required to permit achieving the conditions that were prerequisite for the primary test objective. BMDO would later challenge the Navy's decision to declare this "no test" rather than a failure.

29 Sep 97 The Ballistic Missile Defense Organization and the U.S. Army successfully demonstrated the first Developmental Test Flight (DT-1) of a PATRIOT Advanced Capability-3 (PAC-3) missile at White Sands Missile Range, N.M. Preliminary data indicate the test was successful. Test objectives included the verification of launch and flight functions, interfaces with the existing Patriot System, and missile operation in flight environments prior to targets intercept missions. No intercept of a target was attempted in this test.

17 Oct 97 The U.S. Army test-fired the Mid-Infrared Advanced Chemical Laser (MIRACL) at an old Air Force satellite. The laser fired two bursts at the satellite, one for less than a second and a second one for about ten seconds. Neither the satellite's laser camera that was the target of the firing, nor the satellite was damaged in the test.

15 Dec 97 At approximately 11:15 EST, the second PATRIOT Advanced Capability (PAC)-3 controlled test flight took place. After clearing the launch tube, the missile executed a pull up maneuver using fourteen attitude control motors. The missile reached an altitude in excess of fifteen kilometers before pitching over to fly down range. Ninety-seven seconds into flight, the launch crew commanded the remaining attitude control motors and flight termination system to function. All indications are the missile flight was nominal. The Radio Data Frequency Link (RFDL), one of the items which did not function on the first controlled test flight, did transmit and receive data.

15 Jan 98 The National Missile Defense (NMD) Integrated Test Flight-2 (IFT-2) was carried out successfully. All NMD Integrated Flight Test Objectives, as specified in the IFT-2 Detailed Test Plan, were completed. Test data was collected at all nodes of the NMD System for later analysis. 6 Apr 98 Pakistan tested its Ghauri missile, which reported has a range of 950 miles and can carry a nuclear warhead of more than 1500 pounds. The missile was named after a medieval Afghan king who defeated the Hindu ruler of New Delhi. The capabilities of this missile, as well as the symbolism of its name, were considered to be highly provocative by the Indian government.

14 Apr 98 The Kraken cruise missile built by the BMDO Countermeasures Hands-On Project crashed on take off from Point Mugu, California. The Kraken was built to test the ability of a rest-of-world country to develop this type of weapon.

17 Apr 98 The Ballistic Missile Defense Organization (BMDO) announced the successful launch of its Red Crow Flight Experiment. The purpose of the Red Crow Flight Experiment was to assess the operational performance of a suite of ballistic missile countermeasures under real atmospheric flight conditions. Preliminary flight data indicated that the Red Crow mission objectives were met. The Red Crow launch took place from the Kauai Test Facility, Barking Sands, Hawaii, at approximately 1:05 PM EST.

12 May 98 THAAD Flight Test 08 was conducted at White Sands Missile Range, New Mexico, this morning at 0522 Mountain Standard Time. The test was a failure. Preliminary investigation indicated that the THAAD missile lost control shortly after launch. The missile impacted on the White Sands Missile Range about 2 miles north of the launch site. The cause of the failure was later determined to be an electronic short affecting the missile's thrust-vector control system. This was the fifth straight failure to intercept for THAAD. The fourth failure earlier had triggered major concern about the program.

15 Jul 98 The Commission to Assess the Ballistic Missile Threat to the United States (Rumsfeld Commission) submitted its report to Congress. The nine commissioners who made up the Rumsfeld panel were unanimous in their conclusions, which included the following: "Concerted efforts by a number of overtly or potentially hostile nations to acquire ballistic missiles with biological or nuclear payloads pose a growing threat to the United States, its deployed forces and its friends and allies. These newer, developing threats in North Korea, Iran and Iraq are in addition to those still posed by the existing ballistic missile arsenals of Russia and China, nations with which we are not now in conflict but which remain in uncertain transitions. The newer ballistic missile-equipped nations' capabilities will not match those of U.S. systems for accuracy or reliability. However, they would be able to inflict major destruction on the U.S. within about five years of a decision to acquire such a capability (10 years in the case of Iraq). During several of those years, the U.S. might not be aware that such a decision had been made."

21 Jul 98 Iran carried out the first flight test of its Shahab-3 medium-range ballistic missile, which was expected to have a range of 800 to 900 miles, sufficiently great to strike virtually any country in the Middle East, including Israel.

31 Aug 98 North Korea flight tested its Taepo Dong-1 missile in a flight that carried over Japan. According to the Washington Times, the missile traveled about 1000 miles, surpassing by 380 miles the range of the No-Dong medium ranged missile. This launch caused an angry reaction in Japan, which immediately canceled plans to extend \$1 billion in aid that was to help North Korea build "two civilian reactors." It also caused a furor in the U.S. government over the next two weeks as its implications for the U.S. threat were teased out.

10 Feb 99 The National Missile Defense program conducted Risk Reduction Flight 5, which was designed to reduce the technical risks inherent in the National Missile Defense (NMD) Integrated Flight Test 3 scheduled for June. Risk Reduction Flight 5 demonstrated real time element hardware and software capabilities and system interfaces. The functions exercised included communications links, system loading and timing, algorithms, cueing, and tracking. The flight also provided the National Missile Defense Test Team with training and a rehearsal for NMD Integrated Flight Tests 3. Risk Reduction Flight 6 was scheduled for May 12.

25 Feb 99 In a letter to the President, Senator Jesse Helms (R-NC), chairman of the Senate Foreign Relations Committee, asked the President to provide evidence to contradict the contention of Republicans that the 1972 ABM Treaty is moribund. Without this evidence, Helms said, his committee would hold hearings in the near future in which the operating "legal assumption" would be that the treaty is "no longer in force." Accompanying his letter was a memorandum prepared by attorneys George Miron and Douglas Feith for the Washington-based Center for Security Policy, which states that the ABM Treaty died with the demise of the Soviet Union.

15 Mar 99 BMDO and the U.S. Army conducted the Patriot Advanced Capability-3 missile Seeker Characterization Flight (SCF) test at White Sands Missile Range, NM, today at 6:55 a.m. MST. Preliminary data indicated that the test was successful. The objectives of the test included collecting data and analyzing the system/missile capability to detect, track, and close with its target, gathering data on the PAC-3 missile seeker in a flight environment, and evaluating performance closed-loop homing guidance in flight. While interception was not a specific objective of the SCF, the PAC-3 missile did intercept the Hera target missile.

29 Mar 99 In a flight test at White Sands Missile Range, THAAD failed to hit its target for the sixth straight time.

11 Apr 99 India successfully tested its Agni II missile.

14 Apr 99 Pakistan carried out another test of its Ghauri II missile just three days after the Indians conducted a test of their Agni II missile. The Ghauri II is reportedly the longest ranged missile in the Pakistani arsenal. It can hurl a 2,200 pound payload 1,240 miles.

15 Apr 99 Pakistan test fired its 450-mile Shaheen missile.

25 May 99 A test of the THAAD missile was aborted when the Hera target missile failed to follow the appropriate trajectory. This test was to have been the tenth in a series of thirteen flight tests currently planned in the Program Definition and Risk Reduction phase of the THAAD system.

3 Jun 99 Russia conducted another successful test of its Topol M missile. Fired from Plesetsk cosmodrome, the missile hit a target 5,500 miles away in Kamchatka. This was the seventh test in three years for Topol, which NATO designates the SS-27. The maximum range of this three-stage, solid-propellant ICBM is 11,000 kilometers. It is 22.7 meters long, has a maximum diameter of 1.86 meters, and weighs 47.2 tons at launch.

10 Jun 99 THAAD successfully intercepted a Hera target missile at White Sands Missile Range. This test ended a string of six failures.

2 Aug 99 The 11th flight test for the Theater High Altitude Area Defense (THAAD) defense missile system was completed successfully, when the THAAD interceptor struck a Hera target missile at approximately 7:45 a.m. EDT at the White Sands Missile Range, N.M. For the first time in FT-11, THAAD intercepted a target outside the earth's atmosphere. This was also the missile's first intercept of a warhead that had separated from its booster. The difficulty of the test was further increased because cooling of the target in outer space reduced the ability of the missile's infrared sensors to detect it.

16 Sep 99 The Ballistic Missile Defense Organization and the U.S. Army today conducted a successful intercept test of the PATRIOT Advanced Capability-3 (PAC-3) missile at the White Sands Missile Range, N.M. this morning at 7:26 a.m. Mountain Time. Test objectives included a body-to-body intercept of a threat representative of a tactical ballistic missile target; a demonstrated capability of the ground system and missile to detect, track, and engage the target, and to collect data to evaluate missile homing functions.

2 Oct 99 BMDO and the U.S. Army Space and Missile Defense Command successfully carried out the IFT-3 NMD test. At 7:02 p.m. PDT, a modified Minuteman intercontinental ballistic missile (ICBM) target vehicle was launched from Vandenberg AFB, California; and a prototype NMD interceptor was launched approximately 20 minutes later and 4,300 miles away from the Kwajalein Atoll in the Republic of the Marshall Islands. The intercept occurred at approximately 7:32 p.m. PDT and demonstrated the ability of the exoatmospheric kill vehicle to intercept and destroy a ballistic missile target outside the atmosphere. The intercept vehicle weighed about 120 pounds and was equipped with two infrared sensors, a visible sensor, and a small propulsion system. The interceptor's seeker system located and tracked the target and then guided the kill vehicle to a body-to-body impact with the target. The test demonstrated the power of a "hit to kill" interceptor to totally destroy and neutralize a warhead carrying a weapon of mass destruction-nuclear, chemical or biological.

1 Nov 99 The Arrow II missile system successfully completed its first fully integrated intercept test. This was the seventh flight and third intercept for the Arrow 2. During the test, the Arrow took off and flew in a nominal trajectory, acquired the TM-91 target, then locked on and homed in on the target missile. The Green Pine fire control radar and the Citron Tree battle management center both participated fully in the test, performing battle planning, launch operation, up link/down link message applications, as well as post intercept verifications.

18 Jan 00 During NMD's IFT-4 flight test, the interceptor failed to hit its target. The entire mission was virtually flawless, with the malfunction developing during the end game. A blockage in the kill vehicle's krypton cooler caused a sensor failure in the final six seconds of the flight. As a result, the interceptor missed its target by 73 meters.

5 Feb 00 A PAC-3 missile successfully intercepted its Hera target over the deserts at White Sands Missile Range. The Hera had been launched from Fort Wingate about five minutes before the launching of the Patriot.

15 Mar 00 The Army completed flight test MFT-3B at White Sands Missile Test Range. In this test, a PAC-2 production missile was fired from a PAC-3 launcher and "successfully engaged" a target that was towed behind a MQM-107 drone. The purpose of this test was to "demonstrate the ability to launch a standard Patriot missile from a PAC-3 launcher and collect reliability data on the production missile round."

8 Jul 00 The IFT-5 test, a major test in the U.S. National Missile Defense program, failed to achieve the planned intercept. This failure was an important factor in President William J. Clinton's decision to defer the initiation of an NMD deployment in Alaska.

14 Oct 00 The Ballistic Missile Defense Organization and the U.S. Army completed Development Test-6 (DT-6) in the Patriot program. This was a complex test involving three targets and two interceptor missiles. The test entailed a simultaneous engagement using a PAC-3 and a PAC-2 missile and two targets, one a ballistic missile, the other an air-breathing drone. One of the principal objectives of the test was to demonstrate system capability to engage and destroy a maneuvering tactical ballistic missile reentry vehicle with a PAC-3 missile and a sub-scale air-breathing target with a PAC-2 missile. The test also aimed to demonstrate PAC-3 seeker acquisition and tracking of a target with a second object present in the seeker's field of view. The targets used in the test were a tactical ballistic target (STORM) and an MQM-107 drone (two drones were actually launched although only one was targeted). □□□□ During this highly successfully test, which was conducted at White Sands Missile Range, New Mexico, the PAC-3 missile intercepted and destroyed the STORM target. While the PAC-2 missile did not destroy its sub-scale drone target (MQM-107), the drone did appear to be damaged.

25 Jan 01 BMDO and the U.S. Navy conducted a successful flight test of the newly developed Standard Missile-3 (SM-3). The missile was launched from the Aegis cruiser USS Lake Erie in the Pacific Ocean with support from the Pacific Missile Range Facility, Kauai, Hawaii. The test was formally known as "the Aegis Light Exo-Atmospheric Projectile (LEAP) Intercept Flight Test Round (FTR-1A) mission."

Jun 01 The Defense Science Board Task Force on High Energy Laser Weapon Systems Applications completed its study. Among its findings was the conclusion that "high-power lasers" had "the potential to change future military operations in dramatic ways."

14 Jul 01 The Ballistic Missile Defense Organization, BMDO's Mid-Course Joint Program Office, and the U.S. Army successfully completed Integrated Flight Test 6 (IFT-6), a test of BMDO's mid-course, exoatmospheric kinetic kill vehicle.

31 Aug 01 BMDO conducted its Booster Vehicle-2 (BV-2) flight test. The missile was launched from Vandenberg Air Force Base, California, at 1600 EDT. All three stages of the booster operated properly. Although telemetry on the attitude control system was lost 33 seconds into the flight and the roll rate of the missile was above normal, the "actual trajectory was indistinguishable from [the] planned [trajectory]." Overall, BMDO considered the test successful.

11 Sep 01 Terrorists hijacked four passenger jets, crashing one into each of the towers in the World Trade Center and one into the Pentagon. The fourth plane crashed in Pennsylvania, when passengers alerted to the hijackers' intentions attempted to gain control of the plane.

3 Dec 01 BMDO and the U.S. Army successfully completed Integrated Flight Test 7 (IFT-7) in the Ground-Based Midcourse Segment portion of the overall missile defense program. This was two straight successes and brought the count in the intercept test series to three successes out of five attempts.

13 Dec 01 President George W. Bush served notice to Russia that the United States was withdrawing from the ABM Treaty and was giving the required six-months notice.

13 Dec 01 During the Boost Vehicle Three (BV-3) test, the prototype booster for the Ground-Based Midcourse Segment of the Ballistic Missile Defense System in the Boost Vehicle Three (BV-3) drifted off course and had to be destroyed for range safety reasons after only about thirty seconds of flight.

2 Jan 02 Secretary of Defense Donald Rumsfeld issued guidance on the execution of the U.S. missile defense program. Included here were instructions that the Ballistic Missile Defense Organization be renamed the Missile Defense Agency.

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