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HISTORY

of the

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CHRONOLOGY

1941	5	Oct	Camp Cooke activated, U.S. Army.
1946			Camp Cooke inactivated.
1950	7	Aug	Camp Cooke reactivated as Army training center.
1953	1	Feb	Camp Cooke again inactivated; caretaker status.
1954	1	Jul	Establishment of Western Development Division (WDD) of the Air Research and Development Command (ARDC).
1955		Nov	WDD assigned responsibility for intercontinental ballistic missile (ICBM) initial operational capability (IOC).
1956		Jun	Atlas Site Selection Board recommended Camp Cooke for ICBM IOC.
	16	Nov	Secretary of Defense directed transfer of part of Camp Cooke from Army to Air Force.
1957		Feb	First Air Force unit (WDD's 6591st Support Squadron) installed at Camp Cooke.
		Apr	ICBM site construction begun at Cooke AFB.
	1	Jun	WDD redesignated Air Force Ballistic Missile Division (AFBMD).
	13	Jun	Work started at Cooke AFB on first Atlas launch facility.
1958	1	Jan	First Missile Division, Cooke AFB, and subordinate units transferred from ARDC to Strategic Air Command (SAC); ARDC continues support.
		Mar	Agreement between Air Force and Navy on joint use of Pacific Missile Range.

1958		Jul	Contract awarded for construction of second Atlas site at Cooke AFB.
	31	Jul	Start of work on hardened underground Titan silo-type operational system test facility (OSTF).
	4	Oct	Cooke AFB redesignated Vandenberg AFB.
	16	Dec	First launch of Thor intermediate range ballistic missile from Vandenberg AFB.
1959	16	Apr	First successful operational training launch of Thor missile from Vandenberg AFB in British RAF training program (Operation LION'S ROAR).
	30	Jun	AFBMD turned Thor facilities at Vandenberg AFB over to SAC's First Missile Division.
	23	Jul	Construction started on first semihardened Atlas launcher at Vandenberg AFB.
	31	Aug	AFBMD turned over first completely operational ICBM site (Complex 576-A) at Vandenberg AFB to SAC.
	9	Sep	Successful Atlas launch, first by SAC crew, from Vandenberg AFB.
1960		Mar	Air Force acceptance of Titan OSTF at Vandenberg AFB.
	22	Apr	Operational Atlas, first from horizontal storage facility, fired at Vandenberg AFB.
		Jun	Turnover of second Atlas site (Complex 576-B) from ARDC to SAC at Vandenberg AFB.
	10	Aug	Launch of Discoverer XIII from Vandenberg AFB, followed by first recovery of data capsule from orbit.
	3	Dec	Titan OSTF silo at Vandenberg AFB accidentally destroyed; Silo Launch Test Facility to be used pending repair of OSTF.

THE INTERCONTINENTAL BALLISTIC MISSILE AND VANDENBERG AIR FORCE BASE

Introduction

These pages summarize certain activities of the Air Force, the Air Research and Development Command, and the Air Force Ballistic Missile Division from 1956 through 1960. From these efforts and events came the initial intercontinental ballistic missile establishment at Vandenberg Air Force Base and the installation of this new weapon in the Nation's operational arsenal. The transition from Camp Cooke to Vandenberg is also a pertinent part of the story.

An illustrated summary rather than exhaustive, definitive history, this chapter stemmed from a "Picture History" prepared in March 1961 by the then Historian of the Ballistic Missile Division, Dr. Alfred Rockefeller. The annotated Ballistic Missile Division chronologies for appropriate years and a Strategic Air Command historical sketch of the Camp Cooke background provided a brief narrative to supplement the picture captions. Miss Margaret C. Bagwell, in the Office of the Command Historian, Air Force Systems Command, did much of the work in assembling this narrative.

For simplicity's sake, the photographs have been grouped at the end of the text.

Evolution of Initial Operational Capability

Camp Cooke, located 168 miles north of Los Angeles on a rolling dry plateau adjacent to the Pacific Ocean, was named for Major General Philip St. George Cooke, a cavalry officer in the Mexican and Civil Wars. First activated as a military installation on 5 October 1941, Camp Cooke (now Vandenberg Air Force Base) became a training site for the 5th, 6th, and 11th Armored Divisions, the 97th Infantry Division, and the 2d Philippine Infantry Regiment during World War II. In 1944 a German prisoner-of-war camp was established on the Base, and a year later the Army Disciplinary Barracks took over. Camp Cooke was inactivated in early 1946 and put on caretaker status.

The installation was reactivated on 7 August 1950 as a training base for the 13th and 20th Armored Divisions, and for the 40th, 44th, and 86th Infantry Divisions during the Korean Conflict. The Army Disciplinary Barracks again assumed responsibility for facility security and maintenance following the second base inactivation on 1 February 1953. Camp Cooke remained idle insofar as military operations were concerned for the next three and a half years.

The Air Research and Development Command's Western Development Division (on 1 June 1957 redesignated the Air Force Ballistic Missile Division), commanded by Brigadier General Bernard A. Schriever, was established in Los Angeles as the single central manager for intercontinental ballistic missile development on 1 July 1954. The Division was assigned responsibility in November 1955 for achieving the Nation's initial operational capability with the intercontinental missile, and also for developing an intermediate range weapon.

Air Force Headquarters drew up preliminary criteria for selecting operational training bases where the development division could

accomplish its ballistic missile mission, calling for location of the first "soft" bases in the western, central, and eastern United States. General Schriever then directed appointment of an Atlas Site Selection Board to develop specific criteria and to recommend a West Coast site for the initial installation.

The Board's first requirement was that the site should have good target coverage; moreover, it should be so situated that booster fallout on confidence firings would be over the ocean. The location should be far enough south to permit year-around construction and near an existing military support base. The preferred site, in a sparsely settled area with a good water supply, should also permit training firings over the Pacific toward the Eniwetok impact area. Finally, the terrain should lend itself to the construction of massive facilities and foundation excavations.

On the basis of this formidable list, the investigators examined some 200 potential locations and found only 15 suitable for intercontinental missile use. After due consideration, the Atlas Site Selection Board in June 1956 recommended isolated Camp Cooke as the initial West Coast base for ballistic missile operations and operational personnel training. Higher headquarters agreed that Cooke could also support the training and launches of the equally critical intermediate range missile. The Air Force gave the go-ahead for planning construction of three Atlas complexes and development of the Thor operational training capability, and Secretary of Defense Charles E. Wilson on 16 November 1956 directed the transfer of 64,000 acres of the Army base (the area north of the Lompoc branch of the Southern Pacific Railway) to the Air Force. The first Air Force unit, the 6591st Support Squadron under operational control of the Western Development Division, took up residence at Camp Cooke in February 1957. The

following month, 1st Missile Division Headquarters and the 392d Air Base Group became a nucleus for the eventual operational intercontinental ballistic missile units.

The military reservation was no longer a haven for wild game and grazing cattle, as had been the case as late as January 1957 (Photograph 1). Transformation of Camp Cooke into the Nation's first ballistic missile operational and training base was a notable historical milestone. The attached pictures show some of the physical features of that transformation.

On this lonely site (Photograph 2), the Nation's first ballistic missile complex--three launch stands, a blockhouse, service and storage facilities, and operational buildings--was to be built. The construction program got under way at Cooke Air Force Base (the Air Force portion of Camp Cooke) in late April 1957 when the P. J. Walker Company moved in men and heavy equipment to begin work on the Atlas guidance station. The same company also put up the missile assembly and maintenance buildings. Fredericksen, Kasler, and Stolte, Incorporated, on 13 June 1957, started work on the Atlas launch facility. Less than two and one-half years later, on 31 August 1959, the Air Force Ballistic Missile Division turned over the first completely operational site (Complex 576A) to the Strategic Air Command.

As missile site construction progressed, the Division foresightedly expedited a parallel program of rehabilitation to prepare Cooke Air Force Base for an added role--space pioneering. Speaking at a formal ground-breaking ceremony at Cooke on 8 May 1957 (Photograph 3), Brigadier General Osmond J. Ritland, Division Vice Commander, summarized a broad construction program which would include extensive rehabilitation and modernization of chapels,

barracks, mess halls, and other support facilities, in addition to the new construction associated with ballistic missile technical requirements. A modernized airfield and air terminal facilities were also on the books, the whole adding up to an estimated $30,000,000 expenditure during each of the fiscal years of 1957 and 1958. As estimated in 1957, the total construction at Cooke was expected to cost about $100,000,000. By 1960 the incorporation of other major projects--in existence or planned--had boosted this estimate to $700,000,000.

During the May 1957 ceremony Colonel David K. Lyster, Commander of the 392d Air Base Group, watched as General Ritland wielded the ceremonial shovel (Photograph 4), marking the start of the first intercontinental ballistic missile installation in the free world. Afterward, General Ritland displayed the ribbon-bedecked shovel to Colonel Francis B. Howes, Jr., Special Assistant to the Commander of the 1st Missile Division (Photograph 5). By August 1957 Cooke Air Force Base construction had moved ahead convincingly to such complicated tasks as those involved in building the steel-reinforced Atlas launch pad (Photograph 6).

Progressing simultaneously with this construction was the rehabilitation of support facilities. The George A. Fuller Company started to remodel office buildings, renew road networks, and restore water, plumbing, and communication facilities. Priority attention in September 1957 went to the renovation of barracks to provide suitable quarters for Air Force personnel--some of whom had arrived nine months earlier. Barracks renovation involved a thorough rebuilding inside and out. After minimum maintenance for years, many of the existing buildings needed new wiring, plumbing, roofing, and paint (Photographs 7 and 8). The rehabilitation effort by mid-1958 had cost over $25,000,000 for new construction and the renovation of old structures.

General Schriever maintained close contact with the progress being made at the Cooke site and with all interested parties. In October 1957 he conferred informally with local officials on his arrival at the Santa Maria Airport (Photograph 9). General Schriever then proceeded to Cooke for one of his frequent visits. The inspection party included (left to right in Photograph 10): General Schriever's aide, Captain Roger A. Crabbs; General Schriever; Colonel W. S. Rader, Commander of the 704th Strategic Missile Wing; and Colonel Lyster. With General Schriever on his inspection of construction at one of the Atlas launch positions were Colonel Rader and Colonel W. E. Leonhard, the Ballistic Missile Division's Deputy Commander for Facilities (Photograph 11).

From the earliest announcement that Camp Cooke was to become a missile base, General Schriever acted to establish good relations and easy communication with local civic leaders. The swift expansion of the base depended for housing and school facilities on strong support by the local communities. At the same time, the increased number of assigned military personnel and the vast increase in construction activity posed opportunities, as well as problems, for civilian centers in the Cooke Air Force Base area.

When General Schriever found an acute need for on-base family housing, his Division spearheaded an attack on this problem. The Congress subsequently approved the construction of Capehart family quarters, starting with 880 three- and four-bedroom units in 1957. The last of 1,805 authorized units was scheduled for completion in 1961. As they were completed, the Capehart quarters were occupied by married officers and airmen in the higher grades. Other on-base housing to be provided included apartment units for bachelor officers, trailer courts for married airmen in the lower grades, and mobilization-type barracks for the unmarried airmen.

General Schriever broke ground (Photograph 12) for the first increment of Capehart units on 23 October 1957. An informal moment in the ceremony (Photograph 13) found General Schriever talking with Colonel Leonhard (partially hidden); Lieutenant Colonel J. A. Powers, Ballistic Missile Division Information Services Officer (right); and representatives of the construction contractors. Realizing the tremendous impact that Cooke Air Force Base construction and the related military buildup would have on surrounding communities, the Ballistic Missile Division had embarked on an aggressive community relations program to gain the vital support and understanding of those affected. General Schriever spoke on the critical importance of the ballistic missile program at the community banquet (Photograph 14) which followed the Capehart housing ground-breaking ceremony.

An air view of Cooke AFB "suburbia" in April 1958 (Photograph 15) delineated the initial Capehart housing area and reflected the rapid construction progress made in just six months. An attractive ranch-type home (Photograph 16) was typical of the Capehart units, completed by April 1958 and first occupied by an Air Force family the following month. Nonetheless, the local impact was severe. During the construction period and even after housing became available on base, school and home booms occurred in the neighboring communities of Santa Maria and Lompoc. For example, the local school enrollment increased by about 7,500 pupils, and Lompoc's population more than doubled between 1957 and 1960.

In the technical area, the first reported Russian Sputnik in October 1957 gave added stimulus to a United States Air Force desire to hasten assimilation of the intercontinental ballistic missile into operational units. One result was the transfer of certain organizations

and responsibilities from the Air Research and Development Command to the Strategic Air Command. Transfer of the 1st Missile Division (headed by Major General David Wade), its subordinate units, Cooke Air Force Base, and follow-on ballistic missile bases, along with the responsibility for attaining an initial operational capability for the missiles became effective 1 January 1958. Despite its loss of this responsibility, the Air Research and Development Command continued active participation in the buildup of ballistic missile installations at Cooke. The Command's Ballistic Missile Division retained responsibility for design and installation of all ballistic missile facilities, and for the installation and checkout of launch sites before their operational turnover to the Strategic Air Command. To meet the task of earliest possible operational readiness, the Ballistic Missile Division and its associate, Space Technology Laboratories, established a field office at Cooke in June 1958 (Photograph 19). The office functioned as the Division's representative in supervising and aiding contractor activity in the installation and checkout of all missile facilities to insure they met the using agency's operational criteria.

In late November 1957 the Department of Defense directed the Ballistic Missile Division to proceed with plans for peacetime system exercises to meet an urgent Air Force requirement. The Air Force Chief of Staff and the Chief of Naval Operations signed an agreement in March 1958 for joint peacetime operations which would fully utilize the Pacific Missile Range. This arrangement permitted live firings from Cooke without duplicating the Naval Air Missile Test Center facilities at Point Mugu.

Cooke Air Force Base was not only the first Air Force ballisitc missile operational and training base, but--together with associated Point Arguello and the Pacific Missile Range facilities--it also proved

an ideal site for locating installations essential to operation of the Air Force space program. By a fortunate gift of geography, a point of land extending into the Pacific Ocean offered an excellent spot for launching space vehicles south into polar orbits. This same area also furnished an almost ideal environment for an interference-free space communications center. Thus, at Point Mugu a space tracking station and launch facilities for the Discoverer project neared completion by early 1958, including the elaborate and massive electronic equipment essential to space communications (Photograph 17).

Rapid progress featured preparation of the first Atlas launch complex, as well as other construction at Cooke. Accordingly, late July 1958 saw the contract award for construction of the second Atlas complex at Cooke. Another significant occurrence in the same period was the start of work on an operational system test facility for the new Titan missile. This construction had been approved by the Department of Defense in March 1958 and represented a pioneer architectural and engineering effort. The Titan facility was to be the Nation's first hardened underground missile installation. In September 1958, a short three months after construction started, the silo excavation (Photograph 18) was taking shape; it eventually reached a planned depth of over 160 feet. The silo, however, was destroyed by an accident shortly after completion in December 1960.

In addition to the Atlas and Titan installations, the Ballistic Missile Division's Military Construction Program at Cooke included the Nation's first intermediate range ballistic missile (Thor) training and launch facilities--as differentiated from test facilities. The Thor, scheduled for operational deployment in Britain, would not be positioned operationally within the United States, as were the intercontinental weapons. Since no live Thor training launches could be

conducted conveniently in Britain, Royal Air Force training firings were to be made from the West Coast installation.

The military construction program for Fiscal Year 1957 included Thor Complex 75-1, consisting of two launch emplacements for training purposes, and the Vinnell Company commenced work on this facility at Cooke on 12 July 1957. The Fiscal Year 1958 program called for three more launch emplacements for training (Thor Complex 75-2) and three emplacements for space project launches using Thor boosters (Complex 75-3).

The first operational Thor reached the Base in August 1958, and the first Thor launcher with associated environmental shelter and operating equipment underwent installation and checkout in September. Completion and successful operation of the pioneer Thor installation was demonstrated by the historic launch (Photographs 20 and 21) on 16 December 1958 of the first intermediate range ballistic missile from the former Cooke Air Force Base (redesignated Vandenberg Air Force Base on 4 October 1958, in honor of the late General Hoyt S. Vandenberg, former Air Force Chief of Staff and an early missile proponent). The Thor roared off from the newly-finished pad in a flight that met all launch objectives. The Ballistic Missile Division on 30 June 1959 turned over to the 1st Missile Division all major operational Thor installations--Complexes 75-1, 75-2, and associated support buildings.

Readying of the Thor launchers at Cooke coincided with preparation for the eventual Thor deployment in Britain. The first group of Royal Air Force students arrived in the United States and began a month of integrated weapon system training in August 1958. Operation LION'S ROAR, the first operational training launch by the Royal Air Force (Photograph 24) occurred successfully at Vandenberg on

16 April 1959 as the graduation exercise for and by the newly-trained British missileers. Conducted in the presence of visiting British newsmen, this dramatic launch was a feature in their Nationwide tour of American missile facilities that went far to create a favorable opinion for Thor in the United Kingdom. Royal Air Force crews launched a total of 12 Thor missiles between April 1959 and March 1960; two of these were night launches, and three were combat training launch exercises.

In the meantime, workmen continued construction of Atlas Complex 576-A, and were putting the finishing touches on the first launch emplacement in November 1958 (Photograph 22), including the launcher, its servicing tower, flame deflector, and spillway. The complex was completed and turned over to the integrating contractor, Convair Astronautics, for installation and checkout of operational and ground support equipment in January 1959.

The static firing of an Atlas served as a final check. Then, on 31 August 1959, the 1st Missile Division delivered Complex 576-A to the operational control of the Strategic Air Command, thus adding the first operational intercontinental ballistic missile complex to the arsenal of the western world. Ten days later a Strategic Air Command crew, with Ballistic Missile Division and contractor backup, successfully launched its first Atlas missile to demonstrate conclusively that Vandenberg possessed an initial operational capability a full six months ahead of the 1954 prediction. Fired from Complex 576-A on 9 September 1959 (Photograph 25) the first Atlas, like the Thor launched previously by the Royal Air Force, scored a 100-percent success. General Wade, 1st Missile Division Commander, announced: "The Atlas squadron at Vandenberg is now integrated into the Strategic Air Command's emergency war plan and is ready to launch on 15 minutes' notice."

The second Atlas complex, designed to have three launch emplacements, was also taking shape in November 1958--forms were in place and workmen were laying reinforced concrete (Photograph 23). This Atlas installation improved upon the first and featured horizontal storage of the missile and equipment, thus providing for easier maintenance. The change eliminated the bulky servicing towers of Complex 576-A, which closely paralleled the test facilities at the Atlantic Missile Range. In this "coffin" complex of the second installation, a special cradle raised the missile to the vertical position on the launcher for firing. This configuration change illustrated an important principle followed in the ballistic missile program--progressive incorporation of technical advances in the operational system as soon as feasible. It was this principle which made Vandenberg impressive, for there one could follow each of the basic configurations--soft, hard, and hard silo; radio-inertial and inertial--which were to be deployed in follow-on bases.

With the completion of basic construction of Atlas Complex 576-B in August 1959, all was ready for installation and checkout. Although turnover of the second complex to the Strategic Air Command did not occur until June 1960, the first of the horizontal concept launching pads was readied by January of that year when Atlas 25D, except for its re-entry vehicle, was in place and undergoing test in the "coffin" launcher (Photograph 26). With the environmental cover rolled back, the missile handling cradle could be seen behind the missile. The emplacement also contained propellant servicing and loading equipment. Important as an addition to the Nation's deterrent strength, the new horizontally-configured launchers also fulfilled an urgent need as a facility for training Strategic Air Command crews in Atlas operations.

The first operating crew to complete integrated weapon system training at the new horizontal launcher was finally set to try its skill. On 22 April 1960 the crew erected Atlas 25D from its "coffin" storage to the vertical position, performed the preparatory countdown, and launched the missile with complete success (Photograph 27). This was the first firing of an operational missile from a horizontal storage complex. A second crew launched Atlas 23D from the same facility on 6 May 1960. Although this missile malfunctioned and had to be destroyed soon after flight started, the launch sequence operation was completely successful--the Strategic Air Command crew performed the launch within 45 seconds of the specified operational countdown time.

The Air Force Ballistic Missile Division's plans for the over-all Atlas construction program included three launch pads and three blockhouses (Complex 576-C) for the all-inertial guidance Atlas. Accordingly, construction started on the first semihardened launcher at Vandenberg on 23 July 1959. Shortly thereafter, the Secretary of Defense approved an operational system test facility for the silo-lift Atlas configuration, and construction of Vandenberg's prototype silo installation got under way in early November 1959. Installation and checkout of ground support equipment was taking place by the end of June 1960, and had reached the same stage, with completion of the hardened facility expected in January 1961. Since the later versions of the Atlas were designed for deployment in hardened underground silos, the missile was to be lifted to the surface by elevator prior to launch. The in-silo launcher, a relative latecomer to Vandenberg's family of missile facilities, was for the all-inertially guided "F" series Atlas. By November 1960, the underground operations center and silo were under construction (Photograph 32).

With development, test, and operational facets of the intercontinental ballistic missile program under way simultaneously to compress the weapon system development cycle, different aspects of the over-all ballistic missile program--including facility construction, equipment installation and checkout, and operational training phases--overlapped within the microcosm of Vandenberg Air Force Base. Thus, integrated weapon system training for the Atlas program proceeded in parallel, not only with the completion of additional Atlas facilities, but also with the construction of installations for the Titan program.

The over-all construction program designed for Titan included the operational system test facility (on a joint occupancy basis), plus the construction, equipping, and checkout of the first operational training base. Upon completion, the first Titan training facility would comprise three missile silos, three equipment terminals, three propellant terminals, an antenna terminal, and a launch control center. One Titan silo was under construction in November 1959 (Photograph 28). By November 1960 the first Titan silos were nearing completion at Vandenberg (Photograph 29). An idea of the massive construction of the hardened Titan installations could be gained by comparison of the workers in the foreground with the surface closure.

Among the facilities under construction was the hardened underground silo-type operational system test facility. The installation was started on 31 July 1958, accepted (less its propellant loading system) by the Air Force in March 1960, and completed in May 1960. Its purpose was to facilitate the installation and checkout of two-stage Titan missiles in their operational setting by integrating all components into a perfectly functioning system prior to weapon deployment.

After the facility completion, a series of missile/facility compatibility tests took place, first with a dummy and then with a flight

test missile. One November 1960 exercise (Photograph 30) demonstrated the erection of the missile from the protective silo. The tests were virtually complete, except for an actual launch, when on 3 December 1960 the elevator malfunctioned while lowering Titan V2 into the silo. An explosion destroyed the facility.

Although the loss of this Titan installation imposed problems, a second Titan silo which would serve even more advanced purposes than its predecessor was already under construction. This was the Silo Launch Test Facility which, although also designed for integration and test purposes, was differentiated from the operational system test facility by an important design advance--a capability for in-silo launch. Thus, whereas the early Titan was elevator-lifted to the surface prior to launching, the new system would decrease vulnerability by avoiding exposure to the surface. This important improvement was made possible by confirming tests performed under Ballistic Missile Division supervision in 1958. In December 1960, when installation and checkout was nearly complete, a checkout missile was mounted in the silo (Photograph 31). The top "floor" of this silo could be raised and lowered for maintenance work, while the massive sliding door provided maximum protection in the event of attack.

Inclusion of the inertially guided Titan and Atlas configurations in the ballistic missile force allowed individual dispersion of launch sites, with even greater protection from attack. All squadrons would employ this type of launching installation which was under construction at various sites throughout the United States at the close of 1960.

Ballistic missile construction at Vandenberg was not limited to Atlas, Titan, and Thor. In February 1958 authority was given for development of a new missile--the three-stage, solid propellant Minuteman. This second generation missile, with characteristics designed to reduce weapon system costs, can stand always on the ready

in a hardened configuration; it effectively increases the deterrent posture of the Nation. Minuteman facilities programmed for Vandenberg include six operational-type silos, one hard launch control center, and four "soft" centers for operational readiness training and launch site tracking for mobile operational readiness training. Construction of the initial Minuteman launchers began in 1960. These were designed for training, systems checkout, and confidence firings. By April 1961 construction was advancing rapidly (Photograph 39).

Vandenberg's importance to the Air Force and the Nation as the first ballistic missile base was emphasized by its selection as the location for the 1959 Air Force Commanders' Conference. Here on 26-27 March 1959 their sessions were held under a portrait of General Vandenberg. In the group (left to right in Photograph 42) were:

Seated: Lt Gen William D. Eckert (TAC); Lt Gen Dean C. Strother, (Hq USAF); Lt Gen Manuel J. Asensio (Hq USAF); Lt Gen William H. Tunner (MATS); Gen Samuel E. Anderson (AMC); Hon. James H. Douglas (Secy, USAF); Gen Thomas D. White (Chief of Staff, Hq USAF); Gen Thomas S. Power (SAC); Lt Gen Joseph H. Atkinson (ADC); Lt Gen Clarence S. Irvine (Hq USAF); Lt Gen Frederic H. Smith, Jr. (ATC); Lt Gen William E. Hall (CONAC); Lt Gen Roscoe C. Wilson (Hq USAF).

Center: Col Ralph M. Wanderer, Jr. (Hq USAF); Col William T. Seawell (Hq USAF); Maj Gen Charles M. McCorkle (Hq USAF); Maj Gen Arno H. Luehman (Hq USAF); Maj Gen James H. Walsh (Hq USAF); Maj Gen John W. Sessums, Jr. (ARDC); Maj Gen Robert B. Landry (Hq USAF); Maj Gen Gordon A. Blake (USAFSS); Maj Gen David Wade (1st Missile Division, SAC); Maj Gen Bernard A. Schriever (AFBMD); Maj Gen James Ferguson (Hq USAF); Maj Gen Hewitt T. Wheless (Hq USAF); Brig Gen William J. Clinch (AU); Brig Gen Joseph T. Kingsley, Jr. (AMC); Col Broun H. Mayall (ADC).

Rear: Col Donald C. Foster (SAC); Col George S. Brown (Hq USAF); Col Bourne Adkisen (Hq USAF); Col John M. McNabb (Hq USAF); Col Robert W. Gates (Hq USAF); Col J. Donald Scullion (Hq USAF);

Col Thomas B. Whitehouse (Hq USAF); Col Maurice L. Martin (Hq USAF); Col Julian B. Cross (AMC); Col Barney A. Oldfield (NORAD); Col Edward B. Rasmesson (Hq USAF); Col William S. Evans (ARDC); Maj Douglas H. Christensen (Hq USAF); Maj James E. Paschall (Hq USAF).

In addition to its numerous activities supporting the Air Force ballistic missile program, Vandenberg was also heavily engaged in the support of national space projects--Discoverer, Samos, and Midas. The Air Force made use of Thor sites for Discoverer launches from Vandenberg, while Samos and Midas space system satellites were launched on polar orbits from Point Arguello on the adjacent Pacific Missile Range reservation. This marked the beginning of Vandenberg's expansion from a missile complex into a national aerospace center.

Point Arguello provided a glimpse of the first Samos launch stand in final installation and checkout stages. The Atlas booster mounted on the stand was used to insure accuracy of stand-booster interface and as an aid in the final checkout procedures. By early June 1960 (Photograph 33) installation of the launch operations equipment, propellant loading systems, and high pressure and liquid gas systems was completed at the Samos stand. Indeed, installation and checkout were far enough along to move the first Samos flight missile--an Atlas booster and Agena rocket second stage--to the launcher (Photograph 34). Removal of the gantry section during final checkout stages in September 1960 resulted in a dramatic view of the Samos on stand at Point Arguello. Technicians were shown making final adjustments preparatory to the first Samos launch on 11 October (Photograph 35).

Seven out of twelve Discoverer satellites had attained polar orbits, but the Discoverer XIII launch from Vandenberg on 10 August 1960 (Photograph 36) provided one of the most significant "firsts" in the national space program. The satellite vehicle went into orbit

after separation of the second-stage Agena from the Thor booster. As it passed on the 17th round--26 hours and 37 minutes after launch--a recovery sequence was initiated near Kodiak, Alaska. A Navy helicopter made the first successful American recovery of a man-made object at the end of a sustained global orbit when it recovered Discoverer XIII's data capsule from the Ocean near Hawaii. Subsequently flown to Washington, the capsule was displayed to President Eisenhower and the general public before becoming a permanent exhibit in the Smithsonian Institution's collection of space vehicles.

With launch facilities to support space program objectives, Vandenberg proved an excellent location for highly important space communications, tracking, and data acquisition installations. The complex nature of such facilities was clearly portrayed in July 1960 by the Vandenberg Tracking and Data Acquisition Complex (Photograph 37). Here are quickly performed such esoteric functions as tracking a satellite in orbit, receiving its reports of the strange space environment, and transmitting commands to the satellite as it hurtles through space.

In contrast to the aspect presented at its inception, the Nation's first operational ballistic missile installation had come a long way from the windswept area of scrubby vegetation and empty sand dunes of General Schriever's initial inspection (Photograph 11). Revisiting Vandenberg Air Force Base in June 1960, he could survey the immense spread of facilities and engineering equipment that had been assembled to constitute the most unusual array of armament in the western world. A giant launching gantry and an Atlas missile on the stand provided a fitting background for the man who had meanwhile become Commander of the Air Force's Air Research and Development Command. With the General were Colonel J. J. Cody, Jr., Commander of the 6565th Test Wing (Development), and Major P. M. Mulcaire (Photograph 38).

Along with the buildup of intricate Vandenberg technical facilities, attention was paid to the provision of the on-base support facilities essential to the well being of Base personnel. Typifying the enormous strides made since 1957 was a January 1961 view of the centralized shopping, banking, and post office facilities established for the convenience of a Base population in the neighborhood of 10,000 (Photograph 40). The Vandenberg Officers' Club (Photograph 41) was another feature; landscaped in Southern California style, it afforded a friendly contrast to the serious business of the Base. Besides housing the Strategic Air Command's 1st Missile Division and related organizations, Vandenberg was also the home base for tenant units which included the Ballistic Missile Division's 6565th Test Wing (Development), the 6594th Launch Squadron, and the 6596th Instrumentation Squadron.

The change of four years was vividly illustrated in the entry and visitor control gate at Vandenberg (Photograph 43). Compared with Camp Cooke as it was in May 1957, these portals opened into an installation that was unlike any other in the Air Force. In the background were Capehart housing and base facilities. Changes that were sparked by the selection of Camp Cooke as the first operational missile training installation had led to a startling transformation.

Thus was created Vandenberg Air Force Base, the forward line of the United States missile force and key bastion in the Nation's defense. Millions of dollars went into the array of operational and ground support facilities required to maintain intercontinental ballistic missiles at the ready. Other funds went into housing, rehabilitation of old structures, and new buildings. With Vandenberg, the new weapons for the first time took their place with aircraft to enhance the deterrent strength of the United States Air Force, the Nation, and the free world.

GLOSSARY

ADC	Air Defense Command
AF	Air Force
AFB	Air Force Base
AFBMD	Air Force Ballistic Missile Division
AMC	Air Materiel Command
ARDC	Air Research and Development Command
ATC	Air Training Command
AU	Air University
CONAC	Continental Air Command
Hq	Headquarters
ICBM	Intercontinental ballistic missile
IOC	Initial operational capability
MATS	Military Air Transport Service
MCP	Military construction program
NORAD	North American Air Defense
OSTF	Operational System Test Facility
RAF	Royal Air Force (British)
SAC	Strategic Air Command
Secy	Secretary
TAC	Tactical Air Command
USAF	United States Air Force
USAFSS	United States Air Force Security Service
WDD	Western Development Division

APPENDIX

PHOTOGRAPHS ILLUSTRATING THE NARRATIVE

(NOT COPIED)