UTAH'S Biggest Business: OGDEN AIR MATERIEL AREA At Hill Air Force Base, 1938-1965

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Former President Calvin Coolidge is reported on one occasion to have commented in his usual laconic manner that: "The business of America is business." In a very real sense, however, the business of Utah is defense. In addition to those employed in the defense-related missiles industry, in 1963 there were approximately 26,000 employees at Utah's Department of Defense installations, and they generated an estimated eight percent of Utah's income. A recent study by Professor James L. Clayton, of the University of Utah, concluded that the federal government has spent roughly $3,000 per person in Utah for defense since World War II. Had the government not done this, Dr. Clayton concluded, Utah would "unquestionably" have reverted to her prewar pattern of a net out-migration of population.[1]

By far the largest business in Utah is the Ogden Air Materiel Area (OOAMA), located on Hill Air Force Base, in Davis County, just south of Ogden and east of Sunset and Clearfield.[2] In December 1963 OOAMA,

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[1] James L. Clayton, "A Comparative Study of Defense Spending in California and Utah Since World War II," paper presented to the Pacific Coast Branch, American Historical Association, Los Angeles, August 26, 1964.

[2] For coding purposes each air materiel area is designated by five letters. Thus, OOAMA for the Ogden Area.

The basic sources for the history of Hill Air Force Base and the Ogden Air Materiel Area (OOAMA) are three volumes written by Miss Helen Rice, OOAMA Historian. They are: *History of Ogden Air Materiel Area: Hill Air Force Base, Utah, 1934–1960* ([Ogden], 1963); *Chronology, Ogden Air Materiel Area: Hill Air Force Base, Utah, 1934–1961* ([Ogden], 1962); and *Chronology, Ogden Air Materiel Area: Hill Air Force Base, Utah, 1962–1963* ([Hill Air Force Base], 1964). In addition, Miss Rice maintains a manuscript chronology which will eventually be made into a volume similar to the latter in the Historical Archives of Hill Air Force Base. The thesis of Colonel John D. McConahay, "The Economic Impact of Hill Air Force Base on the Ogden Area" (Master's thesis, Utah State University, 1955), was also very useful. Unless otherwise indicated, this article is based upon these sources and personal interviews and correspondence.

The authors wish to thank Miss Rice for her time, cooperation, and enthusiasm, which greatly simplified the job of gathering and interpreting the material.

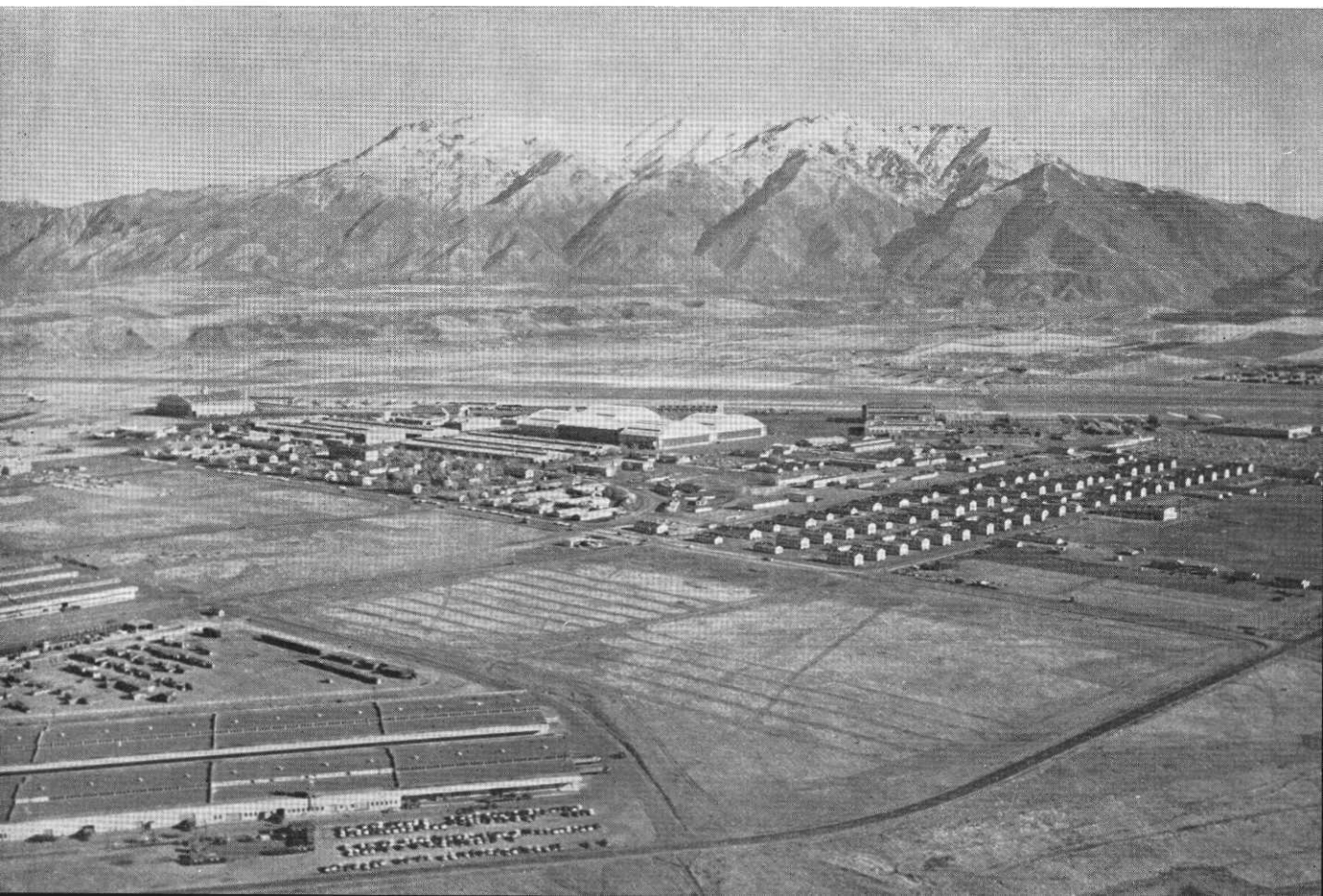
a subcommand of the Air Force Logistics Command (formerly the Air Materiel Command), employed 15,567 persons. Its nearest competitors were the Utah divisions of U.S. Steel Corporation and Kennecott Copper Corporation with less than 7,000 employees each. In 1964 OOAMA stocked 401,000 items in a $638 million inventory. By comparison, Sears, Roebuck and Company in Salt Lake City stocks only 63,280 items.[3] Total assets of the installation amounted to more than $1 billion, which was about equal to the combined assets of all of Utah's banks and savings and loan institutions.[4] OOAMA's current payroll is in excess of $100 million, which is more than those of the Utah divisions of U.S. Steel, Kennecott Copper Corporation, and the Union Pacific Railroad Company combined.

In addition to the responsibilities for the 7,355 acres on or adjacent to Hill Air Force Base, the command includes Wendover Air Force Auxiliary Field, a million acres of land south of Wendover, Utah; the 351,327-acre Hill Air Force Range located about 50 miles west of the base near Lakeside, Utah; the Vernal, Utah, Seismological Site; and the air space

[3] *Daily Herald* (Provo), August 24, 1964.

[4] Hill Air Force Base, Office of Information, *Facts About Ogden Air Materiel Area* ([Ogden], 1960), 5; Harry S. Ashmore, ed., *Britannica Book of the Year, 1961* (Chicago, 1961), 729.

East area of Hill Air Force Base in 1957, the year missile work took on extreme importance not only for Ogden Air Materiel Area, but for the entire State of Utah.



over Dugway Proving Grounds. OOAMA provides technical and logistical support for Air Force units in the area of its geographical responsibility, which includes Utah, Colorado, Montana, Idaho, Washington, Wyoming, North and South Dakota, Alaska, and, on an emergency basis, for Air Force units in the western two-thirds of the Dominion of Canada. Thus, OOAMA has a responsibility for more than 80 bases and other installations. It is the largest in geographical size of nine air materiel areas in the United States.

Founding and Construction

Between March and June 1934, the Air Corps, which at that time handled the United States air mail service, established a temporary depot at Salt Lake City to provide facilities for its aircraft. This venture left a lasting impression on Lieutenant Colonel (later General) Henry H. (Hap) Arnold, who believed that inland depots would be less vulnerable to air attack than coastal facilities. After officers of the Air Corps Materiel Division recommended an investigation into the possibility of locating a depot near Salt Lake City, Congress passed the Wilcox-Wilson Act on August 12, 1935, which authorized the secretary of war to determine the location of permanent Air Corps stations, one of which was to be in the Rocky Mountain area.

Soon after the passage of the bill, Colonel Arnold, Army Air Corps officials, and congressmen visited the Mountain States to inspect possible depot sites. During the visit, the Military Affairs Committee of the Ogden Chamber of Commerce showed the party a site south of Ogden. The location impressed the visiting dignitaries. It afforded excellent flight approaches from all directions, had adequate water and good drainage, was close to Ogden, and near a spur of the main line of the Union Pacific Railroad.[5]

The courtesies shown General Arnold's party by the Ogden Chamber of Commerce were part of an aggressive local program aimed at expanding the industrial base of the area. Utah was in every sense of the word a depressed area. Between 1930 and 1940 population had increased from 507,847 to 550,310, while total employment dropped from 170,000 to 148,886. Employment in every branch of industry — including agriculture, mining, manufacturing, and the services — had dropped. The Ogden Chamber of Commerce optioned the land from owners of the proposed site to prevent speculation, being convinced that it was the most logical

[5] Wesley Frank Craven and James Lea Cate, eds., *Men and Planes,* Vol. VI, *The Army Air Forces in World War II* (7 vols., Chicago, 1955), 128–29.

one. The original 3,002 acres, of which the Chamber of Commerce donated 386 acres, was valued at $128,080.

After the site had been selected, the War Department had to secure funds for construction. The Air Corps obtained assistance from the depression-inspired Works Progress Administration, which completed on November 10, 1939, a $158,585 temporary facility project. This temporary construction went ahead concurrently with a preliminary survey which was completed in February 1940. By January 1939 Japan had begun its conquest of Asia and Germany had annexed Austria, and considering the generally grim situation in the world, President Franklin D. Roosevelt asked for $8 million for the Ogden Air Depot at Hill. In July 1939 Congress voted not only that amount, but an additional $3.5 million for another WPA project. The Ogden Chamber of Commerce helped at the construction site by securing grading equipment and other machinery from local governmental units.

The original construction of the base, which took place between 1938 and 1942, cost more than $30 million. Formal ground-breaking ceremonies occurred January 12, 1940. Among other facilities, the government constructed the runway complex; a sewage treatment plant; a radio transmitter building; quartermaster facilities; fire- and guardhouses; a communication building; quarters and barracks; a chemical storage building; a paint, oil, and packing warehouse; a storm sewer system; operations hangar and annexes; an engine repair shop; an engine test building; an aircraft reclamation building; an airplane repair shop; an equipment repair building; and hospital facilities. After the initial construction, building continued on into World War II.

The site of the Ogden Air Depot received its first designation on December 1, 1939, when the War Department named it Hill Field. This was in honor of Major Ployer P. Hill, who was killed in October 1935 while testing the first model of the B-17.[6] The Ogden Air Depot was designated to serve a dual purpose. It served as a major supply and maintenance depot for five stations in Washington, one each in Oregon and

[6] Major Ployer P. Hill was born on October 24, 1894, in Newburyport, Massachusetts. He graduated from Brown University in 1916 with a B.S. Degree in Civil Engineering, and on December 4, 1917, he enlisted in the Aviation Section of the Signal Corps. During the first World War he served at various posts in the United States, and in 1920 and 1921 served with the American army of occupation in Germany. After serving at various posts in the United States, he was transferred to the Philippines where he was stationed between 1929 and 1932. Upon his return to the United States, he served at Wright Field, Dayton, Ohio, where he was killed October 30, 1935, while testing a Boeing XB-17 Flying Fortress. His son, Major Ployer P. (Pete) Hill, Jr., is (September, 1964) stationed at Hill Air Force Base where he serves in the Management Services Division. Major Hill is currently the same age and rank as his father when he was killed. Information supplied by the Historical Office, OOAMA.

Idaho, two in Utah, and three reserve stations. At the same time it was named as auxiliary depot for the area controlled by the Sacramento Air Depot. On February 1, 1943, the Air Corps divorced the Ogden Air Depot from Sacramento, elevated it to command status on a level equal to Sacramento, and redesignated it the Ogden Air Depot Control Area Command. With the new command also came added responsibility and stature.

On November 7, 1940, Colonel Morris Berman took over as the first commander of the depot (and thus of Hill Field). In January 1941, despite the uncompleted buildings, Colonel Berman accepted ammunition, arms, and other equipment from Fort Douglas, on the eastern bench of Salt Lake City. Shipments began to pour in from Sacramento, and workers had to lease a building in Bountiful to house the supplies. Nevertheless, office equipment was late in arriving, and officials moved into a temporary building containing only six pints of red ink, two dozen erasers, and some packing crates which served as typewriter tables. The only source of heat was a potbellied stove, and wind blew sand through cracks in the walls. In the spring, employees wallowed through the mud.

From the very start Colonel Berman had difficulty securing the necessary number of employees. No Civil Service examinations had been conducted in the area, and therefore no registers were available from which to select qualified administrative, technical, and clerical personnel. For the time being persons were accepted from other depots. Colonel Berman scheduled examinations to fill the Civil Service register and began the training of local people from the vast available supply of labor. The first civilian employee reported for work in January 1941, and by December 7, 1941, 1,639 employees and about 250 military personnel served at Hill Field.

World War II

On December 7, 1941, with the Japanese attack on Pearl Harbor which plunged the United States into World War II, employment at the Ogden Air Depot rose at a phenomenal rate. The need for employees in vital areas prompted the War Department in January 1942 to approve the lowering of job requirements and the hiring of men with physical disabilities. Women were recruited for such tasks as sheet metal work, welding, and aircraft engine repair. Recruiters from the vital facility moved beyond the local area in July 1942, and in March and May 1943 the Ogden Air Depot had reached its all-time peak military and civilian employment of 6,000 and 15,780 respectively, for a total employment of 21,780.

A 48-hour work week was established on January 26, 1942, to utilize available personnel to the utmost.

One of the major problems of the war was the training of unskilled civilians to fill new jobs requiring special skills. Already, in February 1941, the base had established a Mechanic Learner Program, which operated in conjunction with representatives of Utah educational institutions. This program was expanded and salaries of trainees upgraded.

The influx of personnel at Hill Field, coupled with a similar expansion in industry throughout the entire Wasatch Front area, created an acute housing and transportation shortage. Federal agencies aided in the construction of temporary rental units at Grand View Acres in South Ogden, Bonneville Park in northeast Ogden, Washington Terrace in southwest Ogden, Verdeland Park in east Layton, Anchorage Acres near the Clearfield Naval Supply Depot, and Sahara Village just south of Hill Field. Dormitories were opened on base for single workers, and trailer courts were established as stopgap measures.

Local, non-governmental groups also aided in securing housing facilities. The Ogden Chamber of Commerce, in May 1941, established a house registration bureau, and the Church of Jesus Christ of Latter-day Saints assisted in locating rooms in the homes of established families. Nevertheless, some Hill Field employees had to sleep on park benches and in automobiles, and the only real solution to the housing shortage came when the end of the war allowed the greater dispersal of workers.

Transportational problems were not fully resolved until September 1943, when commercially-owned buses began operation between Ogden and Salt Lake City and the base. Before that, car pools were arranged and the local railroads set up schedules to coincide with the work program of the installation.

One generally thinks of an air base as a place where airplanes land, take off, and remain in readiness. Though this was partly true of Hill Field, its duties consisted primarily of supply and maintenance. Its primary function was not unlike that of Tooele Ordnance Depot (now Tooele Army Depot), except that it serviced the Air Corps rather than the Ordnance Corps.

Prior to December 7, 1941, major emphasis had been on the construction of facilities and the storage of supplies. Beginning then, however, the Depot Maintenance Department (later the Directorate of Maintenance) began to function. Though Congress had appropriated money on March 17, 1941, for an engine overhaul mission at Ogden Air Depot, it was not

East area of Hill Air Force Base prior to the end of World War II. Since that time the runways have been extended to accommodate large jet planes which use the base.

until the fall of the year that Maintenance began to operate. It undertook only minor projects until December 8, 1941, when full-scale three-shift operation began. The depot undertook, among other things, aircraft engine repair; repair of an average of 3,000 parachutes per month; the repair and manufacture of scarce aircraft parts; radio repair; winterization of B-26 Marauders, P-39 Airacobras, and P-40 Warhawks for Alaskan Theatre operation; and the repair of bombsights.

The really heavy workload of the depot was the repair and maintenance of aircraft. On April 6, 1942, the first engine was tested, and by September 1942 the shop had reached a monthly average of 75 engines. A few months later, in January 1943, the shop attained an average of 150 engines and 140 superchargers per month. In November 1942 Maintenance began operating a production line for P-39's and P-40's, and in February 1943 it began rehabilitating B-24 Liberator bombers. By July 1943 Maintenance turned out one Liberator per day. In June of 1944 Maintenance overhauled P-47 Thunderbolts and in May 1945 it began to repair A-20 Havoc aircraft.

After mid-1944, part of the depot's projects were aimed at preparation for the war's end. Employment began decreasing, and though aircraft repair remained as the major workload throughout 1944 and 1945, in June 1944 airplanes began arriving for storage. Near the end of the war, the depot began the preparation of B-24's and P-47's for delivery to the Reconstruction Finance Corporation for sale. With the end of World War II in August, Ogden was ordered to complete only those engines currently being overhauled and to store the remainder.

The other primary function of the base was supply. With the outbreak of the war, the Depot Supply Department (now the Directorate of Supply and Transportation) received tons of supplies originally designated for the Philippines. Materials were stacked in every available space, including parking lots, and employees worked seven days a week in an attempt to identify the goods. Eventually, Supply handled parts and equipment for every type of aircraft used in World War II.[7] As Maintenance personnel completed the aircraft for storage in the summer of 1944, it became the function of Supply to store the planes. In 1945, as the war scene shifted to the Pacific Theatre, Supply began to handle more materiel. In the first four months of 1945 Supply handled 3,240 carloads, which was more than twice the amount handled in the first four months of 1944.

MILESTONES IN THE HISTORY OF OOAMA AND HILL AIR FORCE BASE

First official reference to Ogden Air Depot in Pres. Franklin D. Roosevelt's message on the need for construction of new air depots	January 12, 1939
Site of Ogden Air Depot named Hill Field	December 1, 1939
Ogden Air Depot became depot under jurisdiction of the IV Air Service Area Command, Sacramento, Calif.	December 12, 1941
Renamed Ogden Air Depot Control Area Command	February 1, 1943
Renamed Ogden Air Service Command	May 22, 1943
Renamed Ogden Air Technical Service Command	November 14, 1944
Renamed Ogden Air Materiel Area (OOAMA)	July 22, 1946
Hill Field renamed Hill Air Force Base	February 5, 1948

[7] Craven and Cate, *Men and Planes*, VI, 378.

The Interwar Years

At the close of the second World War, enormous amounts of materiel which poured back into the depot were declared surplus, and preparations were made to dispose of it. Supply disposal operation began in November 1945, and by mid-1946 more than $9 million worth of materiel had been placed on a disposal status. In November 1946 engines were released as scrap; some which had cost $23,651 were sold for as little as $22.50. Average return on the program was between 22 and 27 percent.

In addition to the disposal operations, some of the returned materiel was stored. The Army Air Forces planned to store principally B-29 Superfortresses, and Ogden facilities were immediately adaptable for the work. The airplanes were "pickled," and covered to prevent corrosion from dust and moisture. All electronic equipment was removed and sealed for storage. Windows were painted white to reflect the light and thus avoid heat buildup in the aircraft. Engines and aircraft were inspected daily, and some parts were "repickled" every 90 days. After the B-29 project began, the base stored a host of other planes, including A-26 (later B-26) Invaders, P-61 Black Widows, P-51 Mustangs, and P-47N Thunderbolts. In addition engines and ground servicing equipment were placed in storage.

On top of the storage activities, the responsibility of the depot continued to expand. On July 22, 1946, the command was renamed Ogden Air Materiel Area, and the following spring its responsibilities were broadened to include Montana, Wyoming, Colorado, Utah, Nevada, Idaho, North and South Dakota, and western Oregon and Washington. Later, Oregon and Nevada were deleted and all of Washington added. In February 1948 Hill Field was renamed Hill Air Force Base. In the same year the Air Materiel Command reorganized its operations in the United States in an attempt to promote greater efficiency. The United States was divided into two zones; and Ogden, together with San Antonio, San Bernardino, and Oklahoma City, constituted the major supply points in the western zone. In each of the zones, one air materiel area kept stocks and repaired and supplied certain materials for its zone. In 1949 AMC assigned Ogden to supply and maintain commercial electrical equipment, parts for Northrop aircraft, parts for Fairchild aircraft, Pratt and Whitney R-2800 engines, aircraft landing gear, parts for Pratt and Whitney jet and reciprocating engines, the Boeing B-17, photographic ground equipment, and motion-picture equipment, among other items.

The reductions which inevitably followed World War II also hit the Ogden depot. In July 1945 civilian employment stood at 8,543; in Jan-

uary 1946 it stood at 3,095; and by January 1947 it stood at 2,372. Employment then began to rise until the fall of 1949, when the government began to cut back defense spending sharply. This last reduction caused a great amount of consternation, and a delegation of the local chapter of the National Federation of Federal Employees, together with the Utah congressional delegation, met with representatives of the Defense Department. Hill Field's future did not look good. In the spring of 1950, AMC transferred the 25th Air Depot Wing to Ogden on a test basis with the understanding that if the test failed, it would close OOAMA as a materiel area. Although the Depot Wing test failed, OOAMA did not close because of the obvious support the command could give during the Korean War.

Despite the reductions, Maintenance continued to operate during the postwar period, performing such services as modifying B-29's and B-27's for photographic missions. It carried on manufacturing and repairing of parachutes and flying clothing, aircraft and navigational instruments, oxygen breathing equipment, flight instruments, superchargers, propellor governors, and base automotive vehicles. It also continued the reclamation of irreparable aircraft and the renovation of aircraft engines.

During the postwar period, tenants at Hill performed other valuable services for the Defense Department, other government agencies, and local communities. In 1948, as part of the attempt to stop Communist aggression in the Middle East, Hill Air Force Base equipped 30 AT-11 Beech Kansas trainers with bombsights and stabilizers for shipment to Turkey. Hill Air Force Base became a receiving point for Utah patients sent to Bushnell General Hospital in Brigham. It also shipped materiel to Bikini Atoll for the atomic tests. After the Soviets stopped all rail, barge, and highway traffic into West Berlin in June 1948, Ogden supported the Berlin Airlift by shipping materiel and training replacement crews. During January 1949, when severe weather threatened the extinction of wildlife and livestock in parts of a five-state area, Hill AFB employees donated money to buy some of the hay, and in cooperation with the Utah State Fish and Game Commission, pilots operating out of the base air-dropped more than 250 tons of food, medical supplies, coal, oil, heaters, and bales of hay in Utah alone.

The Korean Conflict

On June 25, 1950, a force of Soviet-equipped North Korean Communists invaded the Republic of Korea and plunged the United States into the first of a series of post-World War II Asian conflicts. On July 10, 1950,

the Defense Department ordered a freeze on disposal operations then going on at Hill Air Force Base, and talk of phasing-out the Ogden Air Materiel Area came to an abrupt halt despite the failure of the Depot Wing test.

As a result of the Korean War, construction at the base which had been retarded during the interwar years again took on a new importance. By the outbreak of the Korean War, Ogden's runway system had become obsolete. Recommendations had been made as early as 1945 for a longer runway. Ogden could only repair aircraft which could land at the installation, and that meant either an expansion of facilities or limiting Ogden only to slower propeller-driven aircraft. The base received $3.2 million for fiscal 1951 to construct a modern 10,000-foot runway and taxistrips. After problems concerning the feasibility and priority of the project developed, it was not until April 28, 1955, that Peter Kiewit and Sons began construction on a $3.5 million project. The 13,500-foot runway was completed in March 1957.

As the war broke out, employment levels at the base shot up. Civilian employment rose from 3,656 in June 1950 to 12,210 in August 1952, then leveled out at about 11,000 as the war closed. Military employment jumped even more rapidly from 538 in April 1950 to 3,986 in October 1951.

The astronomical rise in employment brought additional housing and transportation problems. Publicity through radio, newspapers, and other mass media brought some listings, but did not solve the problem. The base made plans for the construction of 350 housing units under the Wherry Act of August 22, 1941. AMC hired the architectural and engineering firm of Holmes and Narver of Los Angeles to prepare a master plan for HAFB, but the plan which they outlined did not take into account the advances to come in the jet age, and the housing project came into conflict with engine test facilities and the proposed runway. Public opinion in the Ogden area then rose up against the proposed construction on the grounds of the probable noise and the potential conflict between private enterprise and the proposed government housing. After these problems were resolved, construction began in July 1952. Unfortunately, the housing units were not occupied to the fullest extent, and the operating company defaulted on its mortgage. The Air Force, which took up the mortgage in November 1957, after some renovation, enjoyed a satisfactory occupancy rate.

As the Korean War ground on into 1952, it became obvious to the Air Materiel Command that central direction of all control functions at Wright-Patterson Air Force Base, Ohio, had caused a huge volume of un-

necessary, costly, and time-consuming paperwork. In June 1952 it began decentralizing its records and equipment, and made Ogden and the other AMA's prime managers for various weapons and weapon systems. This decentralization gave Ogden responsibility for the F-101 Voodoo, and prime maintenance and parts supply responsibility for the SM-62 Snark missile and the B-17, B-26, and F-89 aircraft. In 1953 procurement was further decentralized to give AMA prime responsibility for closer connections with manufacturers of the weapon systems. This change gave OOAMA responsibility for Air Force contracts with the Northrop Aircraft, Incorporated. Ogden also lost some functions such as the control of Quartermaster clothing; but, in general, OOAMA gained in stature and importance from the increased responsibility inherent in the decentralization.

The expanded mission and the need for a greater number of workers left OOAMA with a mammoth labor problem. The cuts in personnel which had taken place in 1949 and early 1950 had left Ogden on near standby status. For the first time since World War II, the command had to seek highly skilled manpower in competition with private industry and other defense installations. In October 1950 a federal Wage Board survey helped to raise pay, workers were not allowed to transfer to other defense installations without securing permission to leave, and higher grade positions were filled from employees who had been demoted under prior reduction arrangements. Once more, women came to make up an important part (28 percent) of the civilian work force. Most of those who came had never worked there before and the already existing training programs had to be expanded. The Mechanic Learner Program was enlarged with the help of Utah's educational institutions. Maintenance personnel also had their skills upgraded through off-base training in such fields as liquid rocket engines, aircraft cabin pressurization, air conditioning, relay telephone exchanges, statistical quality control, in-flight refueling equipment, and aircraft maintenance.

Since World War II most of the maintenance work had been in-storage-maintenance. Toward the end of 1950, great numbers of aircraft were removed from storage. One of the first major tasks at Hill was the overhaul and conversion of B-26 Invaders (the last propeller-driven light bomber to remain in the Air Force inventory) into night intruder bombers. During the Korean War, maintenance personnel reclaimed and reconditioned more than 1,000 B-26's with an average delivery of 18 to 20 per month. Though the duels between the Sabrejets and MIG-15's got the

headlines, much of the workload in cutting supply and communication lines was carried by these World War II workhorses.[8]

During 1951 the activity at the Engine Test Facility, which had repaired up to 150 engines per month during World War II and remained inactive from 1945 to 1948, was stepped up by 700 percent. Ogden AMA absorbed much of the jet engine repair work previously assigned to the Oklahoma City AMA. At first inadequate facilities and the need for shop modification, coupled with the hiring of inexperienced personnel, caused seemingly insuperable problems. Nevertheless, during 1952 Maintenance turned out an average of 212 engines per month. At the conclusion of the Korean conflict, production schedules were cut back to an average of 112 per month.

After the experience of the Berlin Airlift, the Air Force wanted to make sure that industry was prepared for possible expansion, and with the outbreak of the Korean War, it began to contract maintenance work to private business. By the end of 1951, OOAMA had let maintenance contracts with local contractors for more than $1.1 million. These included contracts for night-lighting equipment, ground-camera equipment, motion-picture equipment, fuel- and oil-handling equipment, special tools, hangar and flying-field equipment, generator sets, furniture and fixtures, and packaging materials. By the end of 1952, local industry carried more than $4.9 million in such maintenance contracts, and by 1958 this program had grown to 55 percent of the base workload. The arrangement had the added advantage of leaving base personnel to concentrate on highly technical and critical defense work which private industry was not equipped to perform.

The Maintenance workload was not the only one which increased; Supply was also faced with increased work. In 1949 Supply shipped and received 147,000 tons of materiel by rail and truck and 2,600 tons by air. In 1951, 2.14 million tons were shipped and received, and in 1953, 2.18 million tons. In July 1950 the base received authorization to purchase on the local market, and a procedure was established whereby purchases could be shipped directly from contractors to ports of embarkation.

In addition Supply began in June 1952 to test a mechanized system of property accounting. The Air Force instituted a system in which it relaxed property control procedures for lower value items and strengthened them for higher cost materiel. Prior to this time, the same account-

[8] Colonel Robert D. Johnston, "The Invader Returns," *Air University Review*, XV (November–December, 1963), 11.

ing control had been given to any item whether it was worth $10 or $1,000. Ogden's adoption of these new property accounting procedures gained for it special commendation.

The Missile Age

After World War II workloads and the work force of OOAMA dropped to extremely low figures. That pattern was not repeated after the Korean War. The closing year of the war brought relatively sharp, but short drops in employment. After that, civilian employment rose, then leveled off at between 11,000 and 12,000. At the end of fiscal year 1964, it stood at 11,635. Military personnel remained at approximately 1,700 until January 1960, when the number rose to 2,046. At the end of 1964 some 2,828 military personnel were assigned to Hill.

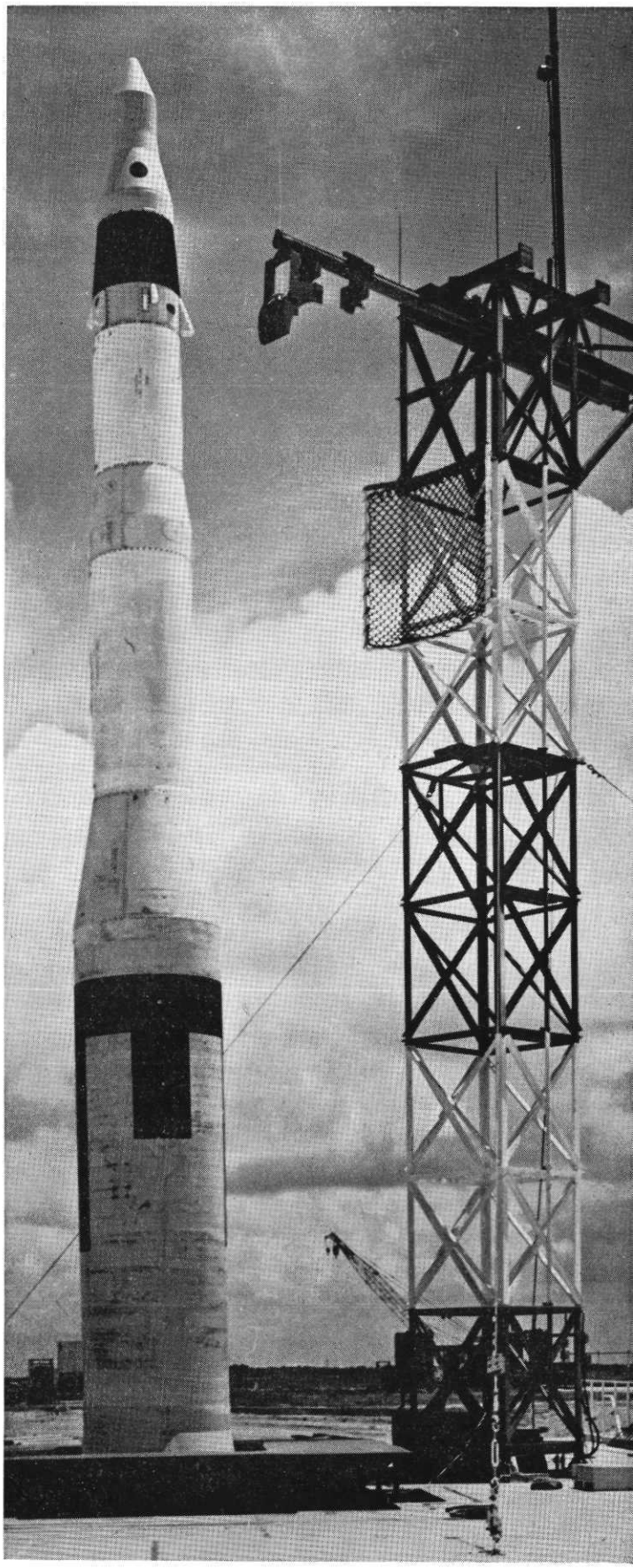
This employment came because of the increased importance of the mission which OOAMA began to perform. In 1954 and 1955, Ogden's responsibilities broadened geographically to their present world-wide scope. In 1956, as an extension of the idea of decentralization, the Air Force Logistics Command assigned prime responsibilities for aircraft, drones, missiles, and engines by manufacturer. Already, Ogden had had responsibility for Northrop Aircraft Incorporated, and to it were added McDonnell Aircraft Corporation, Radioplane Company, Aerojet-General Corporation, Marquardt Aircraft Company, and Reaction Motors, Incorporated. Some aircraft were excluded from the provision, but in general Ogden became responsible for the weapons and engines manufactured by these companies. In 1958 each AMA was assigned as Logistic Support Manager for entire weapon systems, and as new weapons were created, Ogden was given new responsibilities. By 1960 OOAMA was world-wide manager for airmunitions and explosives: the Genie air-to-air rocket, the Bomarc missile, wheels and brakes, landing gears, tires and tubes, training aids and devices, the Minuteman missile, the now defunct Skybolt, the Snark, the F-89, and the F-101. In addition it shared in repair of the F-102 Delta Dagger. When the F-4C entered the Air Force system, that 1,600 mile-per-hour plane was also assigned to Hill. Finally, the base continued to manage the old B-26, since used in Viet Nam as a counter-insurgency weapon.[9]

Ogden continued to improve its maintenance production procedures. Before 1953 Maintenance stripped all mechanisms down to their main sub-assemblies for repair. This was costly and time-consuming. In that

[9] *Hill Top Times* (Hill AFB), August 14, 1964, cites a speech of OOAMA Commander, Major General T. Alan Bennett.

year a new technique called IRAN (Inspect, Repair As Necessary) was adopted and components were not taken apart unless repair was needed. Some customers complained, however, that even with IRAN airplanes were not delivered on schedule. These charges were withdrawn because in 1954, of 593 F-84's and F-89's in production, only six were not returned on time. Nevertheless, in an attempt to improve its service, Ogden sent questionnaires to all commands asking for constructive criticism. A study showed that the basic bottleneck was in the pre-work inspection, and in 1959 Ogden adopted a new production system which it had pioneered on F-101 Voodoos in 1958. The system was called TCTO (Time Compliance Technical Order). This consisted of a specific work package which was negotiated with the using command (customer). Under the system the using command performed its own minor maintenance, leaving the depot free to perform major repair jobs in specified work packages.

OOAMA has had numerous aircraft in production. Its first jet aircraft assignment was Northrop's F-89 Scorpion, for which it had both prime maintenance and supply beginning in January 1953. From then



The Air Force Minuteman intercontinental ballistic missile stands on its launching pad. The first and third stages of the missile are produced in Utah; the complete missile is assembled at Hill Air Force Base.

through 1960, Hill Maintenance repaired or modified a total of 1,318 F-89's. OOAMA also had a specialized maintenance and supply effort for Republic's F-84 and Convair's F-102 for which other depots were prime managers. These, incidentally, were *big* depot workloads: OOAMA employees repaired 860 of the F-84 and 772 different F-102's. Ogden began as prime manager for the F-101 Voodoo in 1952, but its first plane did not come onto OOAMA assembly lines until December 1957. From that time through 1960 Ogden repaired or modified 484 of these aircraft — a major task indeed!

An important development which has helped OOAMA to maintain its importance in the Utah economy has been the addition of missiles to the U.S. weapons' arsenal. Though some research had been done in this area immediately after World War II, it was not until after the Korean War, and especially after September 1955, about two years before Sputnik I, that military missiles received highest national priority. With the development of missiles came also the development of more costly and specialized logistics in which mobility and fast dispersion became prime requisites for success.

AFLC assigned missiles in much the same way as other weapons. During development, the contractor supported the weapon, then as they entered the Air Force operational inventory, an AMA was assigned support for the weapon on a world-wide basis. Until 1957 missile work was a relatively minor part of the OOAMA mission; but between then and 1964, it has taken on extreme importance not only for OOAMA but for the Utah economy. In 1957, for instance, Thiokol Chemical Corporation employed about 75 persons in Utah with a payroll of about $300,000 per year. By the end of 1960, it employed more than 4,000 with a payroll of $22 million. Hercules Powder Company showed a similar development with a 1960 employment of 1,700 and a payroll of $6.2 million.

Some of the missiles have had a very short life. The first successful launch of the SM-62 Snark, an air-breathing, pilotless aircraft, was made in November 1953. OOAMA had responsibility for the support of this missile in 1952, and acted as prime maintenance for its components in succeeding years. Not until November 1957, however, did OOAMA receive its first weapon for depot maintenance, and the government terminated the Snark missile program in June 1961. More sophisticated weapons could do all that the Snark could do, only faster and better. Other even shorter-lived missiles which OOAMA managed included the SM-73 Goose (from June 1957 to December 1958), and the GAM-67 Crossbow

(from May 1954 to April 1957). In 1959 AFLC assigned the air-launched ballistic missile, GAM-87 Skybolt, to Ogden. This weapon did not score its first full success until December 22, 1962, the day after President John F. Kennedy announced termination of the program and British Prime Minister Harold Macmillan agreed to use the Navy's submarine-launched Polaris missile.

A mainstay of the missile sytem has been the CIM-10-A and B Bomarc weapon systems. In April 1956 Ogden was named as prime maintenance and supply depot for the Marquardt and Aerojet-General Corporations, which produced the motors: RJ-43 ramjet and LR (liquid rocket)-59, respectively. In 1955 and 1956, the Department of Defense developed a policy of dispersal of defense industries away from the coast, and Marquardt received approval to expand to Ogden. The company constructed a $4.5 million plant in 1957 and 1958, and the Air Force constructed a $14 million test facility for Marquardt at Little Mountain (AF-Marquardt Jet Laboratory), 15 miles west of Ogden. In connection with the Bomarc program, more than 116 Hill AFB personnel had trained by mid-1960 to do specialized missile work.

On January 6, 1959, OOAMA was selected to manage the LGM-30 Minuteman, which, as General T. Alan Bennett, OOAMA Commander, said, is "really the backbone of our missile force for the free world." [10] The AFLC analyzed the capabilities of the various AMA's and came to the conclusion that Ogden combined the best basic equipment and the best

[10] *Ibid.*

The Bomarc ground-to-air interceptor missile standing in front of the main aircraft repair hangars at Hill Air Force Base. The Bomarc is one of the missiles serviced at Hill Air Force Base.

talent to produce the decisions needed in connection with this important system. It was also close to the launch sites and the Thiokol and Hercules plants where the first- and third-stage motors were produced, and it stood in the center of the fast-growing Wasatch Front industrial complex.

The Minuteman, with a range of about 6,000 miles, was the first of the second-generation missiles. It is powered by a solid propellant which is much easier to handle and can be launched much faster than liquid-powered rockets. Like the Minuteman of Lexington and Concord, this easily operated weapon stands ready to defend its homeland.

The development of Minuteman has had substantial impact upon Utah. In November 1959, when the Air Force announced a contract with the Thiokol Chemical Corporation to produce the first stage of the weapon, it also announced the approval of the construction of the $26 million Air Force Plant No. 78 adjacent to existing Thiokol facilities, which Thiokol would operate for the Air Force. The Air Force also approved the construction of the $11 million Plant No. 77 located in HAFB's west area. This new construction, together with about $4 million worth of existing buildings and facilities, comprise the plant from which The Boeing Company rolled out its first Minuteman in April 1962. The Boeing Company was awarded the contract to assemble all three stages — in other words build the Minuteman. In July 1961 construction began on the $15 million Air Force Plant No. 81, located on 500 acres of Hercules Powder Company land, where Hercules would build the third-stage motor. The plant was dedicated July 25, 1962. Aerojet-General Corporation of Sacramento, California, which maintains an office at HAFB, received the contract for the second stage.

Despite the relative superiority of solid fuel propellants, even the Minuteman needs maintenance. Part of the work can be done in the field, but the failure of any component calls for depot level support. Even before the first missile was sent in for recycling in January 1963, OOAMA began conducting tests on the missile. The propellant must be constantly tested and analyzed for both motive and physical characteristics.[11] OOAMA's 2705th Airmunitions Wing operates an Aging Laboratory in which simulated launch-site conditions give missile manufacturers an opportunity to test their products.

Though missiles form the glamour items in OOAMA's responsibilities, more prosaic missions help to make the command an important link

[11] Colonel E. R. Jacoby, "Air Force Review: Recycle Requirements of the LGM–30," *Air University Review*, XV (January–February, 1964), 101–8.

in the Air Force logistics system. OOAMA is responsible for world-wide management of aircraft tires and tubes; wheels, brakes, and landing gears; training aids and devices; aircraft engines and components; rocket engines and components; ammunition and explosives (except nuclear); biological-chemical warfare weapons used by the Air Force — to name some of the major ones. It is responsible also for the OQ-19 Target Drone and its components; the MER-6A-Program 279 (Mobile Electronics Rocket); Blue Scout (Standard Launch Vehicle-1) Space Booster; Titan III-C Space Booster; 494L Emergency Rocket Communications System.

In the commodity management field, OOAMA has made some notable successes. In January 1962 two technicians, Verl Graser and Jack L. Woods, worked out a system to extend the life of an airplane landing gear three times the original expectancy.[12] OOAMA procures, stores, and distributes 248 different types of tires to about 400 bases. These tires must stand punishment for which no automobile tire is designed. The tire for the F-104, though almost the same size as those used on some compact cars, must be rated at 13,000 pounds, whereas the compact tire must be rated at only 835 pounds.[13]

Up to 1955 the USAF had no ammunition facilities. Air Force military units performing ammunitions work were assigned to Army posts, such as Tooele Army Depot and Pueblo Ordnance Depot. On April 1, 1955, the Ogden Arsenal facility was transferred to the Air Force jurisdiction. The facility was worth in excess of $17 million. Its highway and railroad facilities, its warehouses and ammunition igloos, made it possible for OOAMA to be assigned management of all Air Force airmunitions (except nuclear). Ogden was given control over airmunitions programs in the United States and, upon request, to any Military Assistance Program country or Department of Defense agency. With the adoption of uniform supply classes (Federal Catalog Conversion Program) for all services commencing in 1955, Ogden, owing to its airmunitions capabilities, received an expanded mission. In 1960 OOAMA's complete airmunitions-explosive ordnance disposal mission was reorganized into the 2705th Airmunitions Wing, and Ogden was given world-wide management responsibilities for airmunitions (except nuclear). Detachments responsible to the Ogden headquarters were established from Maryland to Japan. By July 1, 1960, the Wing employed 175 civilians and 501 military personnel.

[12] *Deseret News* (Salt Lake City), January 2, 1962.

[13] Colonel Elmer G. Prohaska, "Aircraft Tire Management," *Air University Review*, XV (November–December, 1963), 81, 84.

OOAMA AND TENANT-ASSIGNED PERSONNEL STRENGTH, PAYROLL, AND OPERATING EXPENSES, 1941–1964

(Source: Helen Rice, *History of Ogden Air Materiel Area, Hill Air Force Base, Utah, 1934–1960* [(Ogden), 1963], 65, 104–5, 227, 232; Helen Rice, *Chronology: Ogden Air Materiel Area, Hill Air Force Base, Utah, 1962–1963* [(Hill Air Force Base), 1964], 29, 58; Helen Rice, "Chronology, 1964" [MS, Office of the OOAMA Historian, Hill Air Force Base], July 5, 1964; and data supplied by Helen Rice, OOAMA Historian.)

	EMPLOYMENT				
Year and Month	*Civilian*	*Military*	*Total*	*Annual Payroll*	*Operating Expenses*
January, 1941	1	2	3		
July, 1941	750	49	799		
January, 1942	2,700	400	3,100		
July, 1942	7,800	2,000	9,800		
January, 1943	9,600	5,200	14,800		
July, 1943	13,600	5,000	18,600		
January, 1944	10,600	2,200	12,800		
July, 1944	10,000	3,000	13,000		
January, 1945	8,863	2,850	11,713		
January, 1946	3,093	1,035	4,130		
January, 1947	2,372	506	2,878		
January, 1948	3,665	340	4,005		
July, 1948	4,395	201	4,596		
January, 1949	4,461	237	4,698		
January, 1950	3,625	365	3,990	$20,600,000*	
July, 1950	3,675	2,108	5,783		
January, 1951	5,554	2,478	8,032	33,466,545	$59,450,578
July, 1951	9,304	3,223	12,527		
January, 1952	10,057	3,049	13,106	48,514,017	79,714,089
July, 1952	11,942	3,152	15,094		
January, 1953	12,133	2,531	14,664	49,584,013	82,748,577
July, 1953	11,227	2,039	13,266		
January, 1954	10,585	2,027	12,612	46,674,739	135,893,949
July, 1954	10,485	3,001	13,486		
January, 1955	10,554	3,432	13,986	52,196,164	181,355,186
January, 1956	11,556	2,744	14,300	55,974,786†	88,830,270†
July, 1956	11,723	1,621	13,344		
January, 1957	11,456	1,551	13,007	58,414,178†	88,804,445†
January, 1958	11,052	1,615	12,667	64,923,523†	100,745,010†
July, 1958	11,385	1,751	13,136		
January, 1959	11,678	1,687	13,365	68,358,575†	117,987,484†
January, 1960	11,915	2,046	13,961	74,101,223†	124,386,922†
January, 1961	11,284	2,274	13,558	75,259,266†	122,943,378†
December, 1962	11,902	3,061	14,963	89,000,000‡	130,241,485
December, 1963	12,525	3,042	15,567	96,115,928‡	132,651,905
Summer, 1964	11,635	2,828	14,463	101,514,968‡	144,226,437‡

* Estimated; figures not available before 1950.

† Fiscal Year.

‡ Estimated.

In May 1954 the AFLC began an intensive program of adapting electronic data-processing to its logistic system. The Korean War had demonstrated that logistics had not kept pace with new supersonic and nuclear developments. With the application of data-processing, supplies could be requisitioned from thousands of miles away merely by pushing buttons. As early as November 1955, OOAMA began service testing, as AMC's pilot depot, a program for mechanization of civilian payroll with the IBM 650 computer. Since that time OOAMA's computer facilities have increased greatly. The IBM 705 computer, which automatically ordered items and set up stock replacement action, was adopted in 1958.

On April 24, 1962, OOAMA received an IBM 7080 computer which replaced two IBM 705II's and was capable of doing the work of three of them. Since that time the 7080 has been one of the major computers in use at the installation. In 1963 the command installed an RCA 9200 magnetic tape terminal (Autodin — Automatic Digital Network) which was capable of transmitting and receiving 10,000 requisitions daily. When a decision of the Federal Trade Commission made it possible for OOAMA to purchase rather than rent much of its computer equipment, the command purchased, in January 1964, two RCA 301 computers, four IBM 1401 computers, and one IBM 7080 computer, at a total cost of $4.3 million. In addition, OOAMA rents 144 pieces of Punch Card Accounting equipment, an IBM 650 Tape Computer, an RCA 301 Computer, and an NCR Computer.

The increased activity since the Korean War has necessitated increased construction. In 1958 two construction projects totaling $6 million — a Paint and Cleaning Hangar and a warehouse — were authorized.[14] In May 1961 a Radar Approach Control Center was completed to direct military aircraft and aid private and commercial planes. In 1961 and 1962 a new space age Air Freight Terminal was constructed at a cost of $973,555.

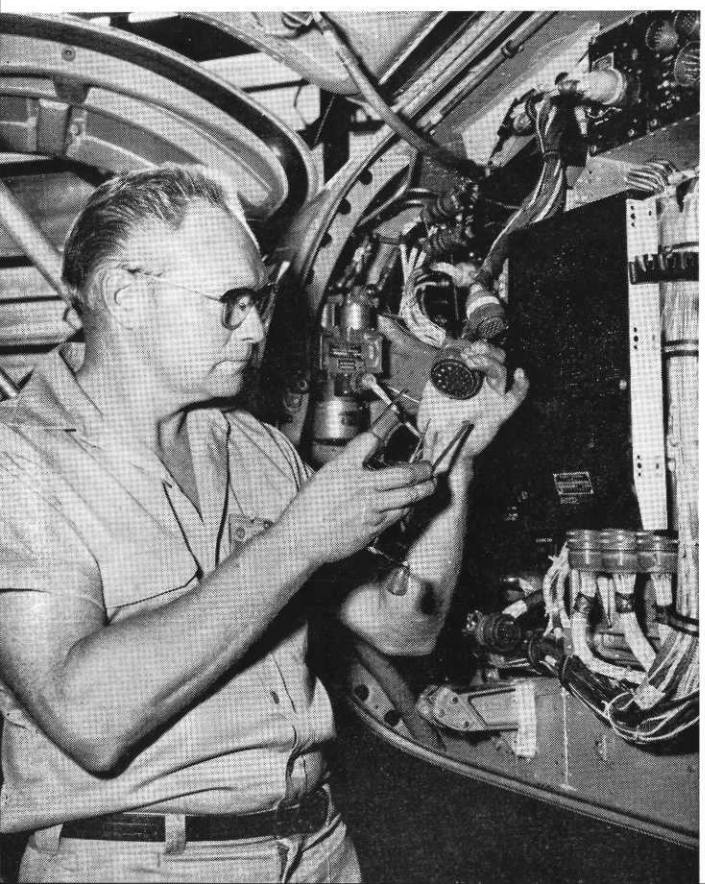
Some of these construction projects might have taken place in the normal growth of the base, but the really expensive construction has been in connection with the missile missions. Special facilities were necessary for the Minuteman recycle and maintenance facility at the installation. Some buildings and structures had to contain earth barricades, blowout panels, explosion-proof equipment and fixtures, and other specialized equipment. The contract for the initial facility went for $2.3 million. Clean Rooms, which are kept 99.95 percent dust-free of particles larger

[14] *Salt Lake Tribune*, January 15, 1958.

than 12 millionth of an inch, cost $300,000 each to build and between $2 and $3 million to equip. (Four of these are in operation.)[15] A contract in March 1963 for four buildings plus igloos and other facilities cost $1.2 million. Two Radiographic Laboratories with 24-million Electron Volt Linear Accelerator X-Ray machines were installed to detect flaws in solid propellant fuel. These 24-million Electron Volt Linear Accelerators are the world's most powerful industrial production-line x-ray machines.

Outside of the plants constructed by the Air Force for operation by the private missiles companies, the most unique and with the greatest potential is the Hill Air Force Range, dedicated July 31, 1964. It is located about 50 miles west of Hill Air Force Base near Lakeside, Utah. At the installation is OOAMA's third Radiographic Laboratory with its 24-million Electron Volt Linear Accelerator. In addition, there are vertical and horizontal missile and airmunitions, explosive and other missile test facilities and equipment. At a touch of a switch, a missile at this $7.5 million facility (near $10 million when fully instrumented) can be subjected to conditions simulating extreme heat or extreme cold, extreme wetness or extreme dryness, below sea level conditions or conditions encountered at an altitude of 20 miles, and pressure ranging from zero to 120 times the force of gravity.[16]

With the development of space-age technology came the need for highly skilled management. To drop the cost of property accounting, management developed techniques so mechanics could take carts down aisles to select items they need just as their wives shop at the neighborhood supermarket. In 1954 OOAMA began an integrated program of work measurement. Within a year after August 1954, labor standards had been calculated and attempts were made to upgrade work standards and



[15] Jacoby, "Air Force Review," *A.U.R.*, XV, 101–3.

[16] *Hill Top Times*, August 14, 1964.

An Hill Air Force Base mechanic checks out the wiring on an F-101 Voodoo jet aircraft. Overhaul and modifications of the supersonic interceptor is one of many space-age missions assigned to the base.

efficiency. In 1958 the base set up an electronic system to develop and analyze labor skills. Everything known about the capabilities of each employee is kept on file so that when new positions open, it is possible, in theory at least, to find the best employee for the job. The system was so successful that in September 1960 it was adopted throughout the Air Force.

In addition to these functions, OOAMA and its tenants have performed numerous special services since the Korean War. C-124 Globemasters from Hill Air Force Base participated in Operation Big Lift, the largest troop movement of its kind, in which 16,000 men were carried from Texas to Germany in 72 hours.[17] After the Alaskan earthquake in March 1964, similar aircraft from Hill AFB shipped water purification units and other material to Alaska to aid in earthquake relief. On November 26, 1962, the Air Force activated, as a detached installation, the Vernal AF Seismological Site for research into the detection of distant underground nuclear weapons tests. This $500,000 unit, located about 12 miles southwest of Vernal, was placed under Hill AFB jurisdictional accountability. In mid-June 1963, the Air Force opened the Green River, Utah, Athena Missile Launch Site for which OOAMA's 2705th Airmunitions Wing provides support by storing motors (42 by June 1964) at Hill AFB until the missiles are ready to launch to the White Sands Missile Range, New Mexico. Two such launches in February and May 1964 (of about 70 planned) were not fully successful.

The influx of personnel, particularly military personnel, necessitated the construction of additional military family housing. Unlike the earlier Wherry Housing units, these were split-level, ranch-style duplex and single-unit houses, located on the southwest perimeter of the base. The Ogden Chamber of Commerce, through the First Security and Commercial Security banks, purchased the proposed site in Clearfield to preclude the possibility of land speculation. Construction began on the first 300 units in March 1962, and on an additional 200 units in April 1963. The total cost was $7.7 million. Occupancy of the 300-unit project began August 1, 1963; for the 200-unit, by May 1964.

The Future

In 1965 the Ogden Air Materiel Area remains a well-established command. Unless the presently clouded world situation should change appreciably in the next few years, the people of Utah can look for more,

[17] *Deseret News*, October 23, 1963.

rather than less, emphasis on missiles and supersonic aircraft — areas in which the installation has excelled. This is the assessment of Major General T. Alan Bennett. As he said to the employees: "Regardless of how well we do our work, how much more productive we become individually and collectively, we will not run out of work. There is too much to be done and too little time to do it." [18] Secretary of Defense Robert S. McNamara underscored this assessment on November 19, 1964, when he announced that an expansion was planned at OOAMA which would add an estimated 5,500 jobs over the three fiscal years 1966 through 1969. OOAMA will benefit by the phasing-out of certain operations at San Bernardino, California AMA; Mobile, Alabama AMA; and Middletown, Pennsylvania AMA. To Ogden's workload will be added management and repair of the Atlas and Titan ICBM's; management of space boosters, the Bull Pup air-to-surface missile, and photographic equipment; and repair of navigational and flight instruments and accompanying equipment for the

[18] Speech cited in *Hill Top Times*, August 14, 1964.

The Minuteman missile being loaded aboard a C-133 B Cargomaster at Hill Air Force Base for shipment to a missile launching site.

RF-101 aircraft. The addition of these employees should send OOAMA employment to approximately 20,000.[19]

In 1963 OOAMA spent more than $126 million in Utah, including $96 million in payroll, $3.5 million in local purchases, $3 million for transportation, $3.5 million in local contracts, $15 million for construction, and $5 million for utilities, rental, communications, and printing.[20] On August 14, 1964, President Lyndon B. Johnson signed a civilian pay raise bill, and one for military personnel the following month, which added more than $2 million to the yearly payroll, raising it to more than $101 million for 1964. Despite the recent emphasis on economy in the Department of Defense, the payroll of OOAMA has actually increased rather than declined.

As a defense industry, OOAMA is exempt from seasonal influences, fluctuations in the general level of business activity, and strikes and lockouts. Barring unforeseen events, it will be able to plan much of its own future through its management of entire weapon systems and its worldwide responsibility for such items as airmunitions and landing gear. There has been a great amount of pressure on the government to contract missile and other critical maintenance to private businesses, but the fact that government commands, such as OOAMA at Hill AFB, are not subject to strikes and lockouts makes them attractive. In addition the wages of industrial employees at the installation, through the Wage Board system, are based on the average of similar occupations in the base area. They remain, therefore, at approximately the same level as plants which may occasionally experience strikes, though some union representatives look upon this as a "free ride" on the part of government workers.

There are several reasons for Utah's important position in the missile industry today. It is far enough inland to satisfy the need for dispersal of defense industry, yet close enough to missile complexes for easy transportation and communications. Land is relatively cheap, abundant, and far enough from population centers to permit production and testing of explosive rocket fuels, yet near enough to provide easy access. Local labor is highly educated and adaptable; the climate and cultural environment are attractive enough to lure outside labor; and transportation facilities are readily available. With such advantages, OOAMA's mission is destined to continue its amazing growth. Utah will almost certainly continue to enjoy the fruits of this billion-dollar business.

[19] *Salt Lake Tribune*, November 20, 1964; and television interview with Major General T. Alan Bennett of November 19, 1964.

[20] *Deseret News*, May 15, 1964.

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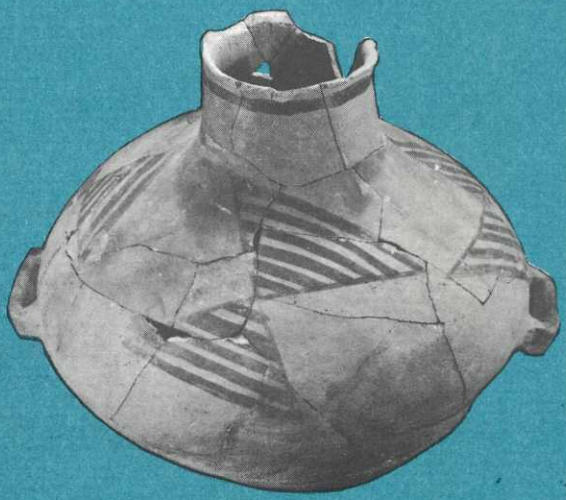

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the cover

Samples of vessels which were excavated in the Upper Colorado River Basin Archeological Salvage Project conducted by the Anthropology Department, University of Utah. Vessels displayed are: Front, top, Tusayan black-on-white jar, Mesa Verda black-on-white mug. Bottom, Middleton Polydrome bowl, Mancos black-on-white water jar. Back, top, Fremont Culture tooled vessel. Botton, corrugated utility vessel.

DEPARTMENT OF ANTHROPOLOGY, UNIVERSITY OF UTAH