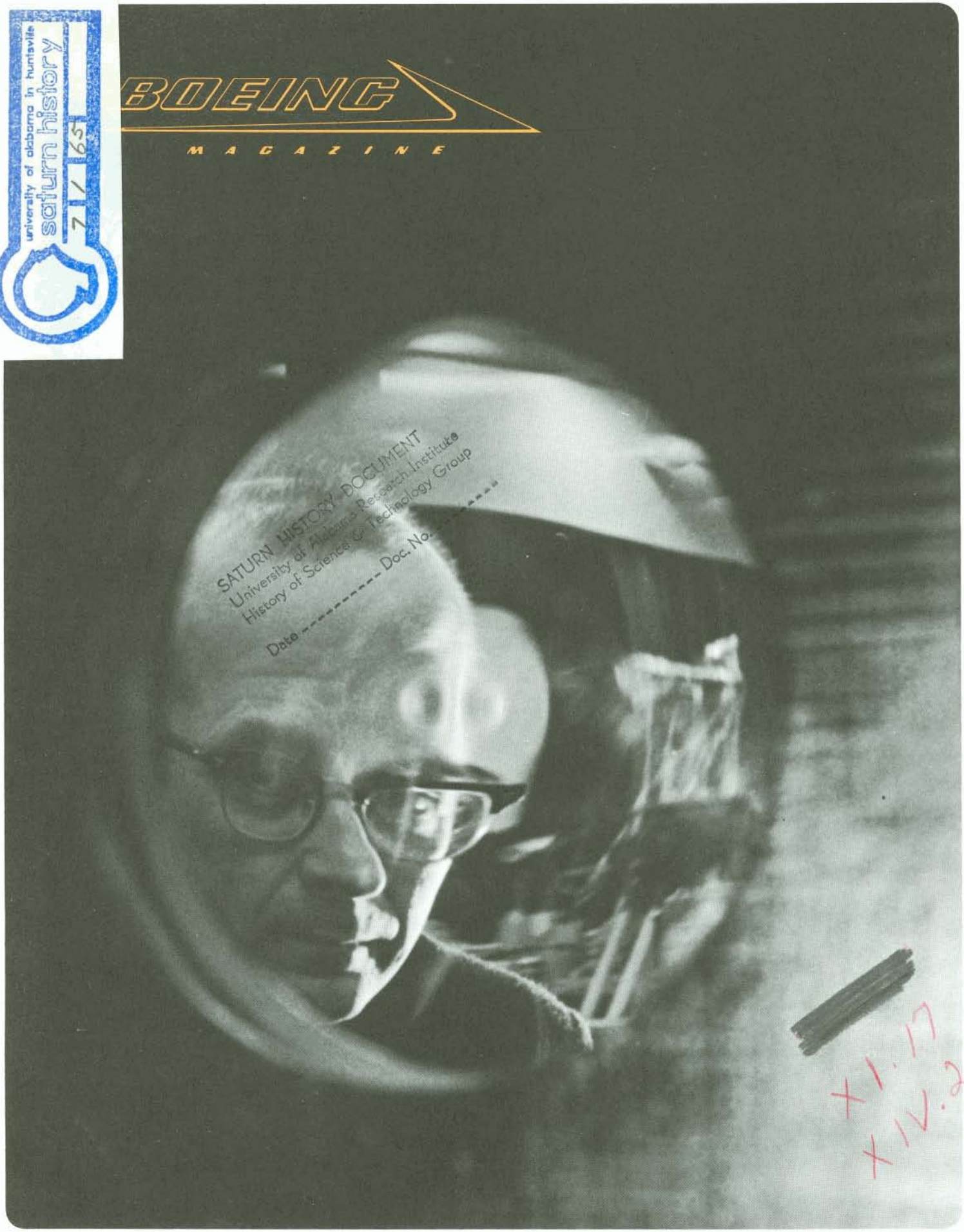
BOEING MAGAZINE



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In This Issue

PHOTO CREDITS—Paul Wagner (cover, 10); NASA, Marshall Space Flight Center (3, 4, 5); National Tourist Organization of Greece (6, 7); Olympic Airways (6); Southern California Gas Co. (11); United States Air Force (12, 13, 15); Thomas Cusick (14).

ON OUR COVER—Boeing research engineer (reflected in an axicon mirror) looks ahead to day when airplane bodies much longer than those of present jets will be built with the aid of a beam of aligned light. Details are on page 10.

THE BOEING COMPANY
HEADQUARTERS OFFICES
7755 East Marginal Way, Seattle, Washington 98124

BRIEFING

Donald J. Euler last month was appointed vice-president, planning, of the Boeing Commercial Airplane Division. Euler, who had been general manager of the Turbine Division since 1961, now directs planning activities for the company's increasing commercial airplane business. He has served in numerous engineering and administrative capacities since joining the company in 1928. Under his direction business volume of the Turbine Division showed significant growth.

Malcolm T. Stamper was appointed general manager of the Turbine Division. Stamper, who will become a company vice-president, joined Boeing in 1962 after serving with the General Motors Corporation in several key management positions involving engineering, research and production. At Boeing Stamper developed the Aero-Space Division electronics production operation into one of the industry's best.

Three airlines have added more Boeing equipment to their jet airliner fleets in recent weeks. National Airlines ordered an additional three Model 727 jetliners and American Airlines announced that it would acquire five more of the trijets plus four Model 707-120Bs. World Airways disclosed the purchase of its fifth Model 707-320C convertible cargo/passenger jetliner.

The 10th revised edition of The National Aeronautical Collections has just been published by the Smithsonian Institution, Washington, D. C., at $2. Written by Paul E. Garber, head curator and historian, National Air Museum, the book provides an exceptional history of man's conquest of the air. There are many illustrations of aircraft, from balloons of the 19th Century to present-day jets. The dramatic histories of two Boeing bombers are included. One is the "Swoose," famed B-17 of World War 2. The other is the B-29, "Enola Gay," which dropped the bomb on Hiroshima.

Another new book is the 1965 edition of United States Aircraft, Missiles and Spacecraft, edited by James J. Haggerty, Jr. The 168-page book contains more than 200 photos. It reports on missiles, space vehicles and aircraft currently in operation and in production. Published by the National Aerospace Education Council, 1025 Connecticut Ave., N. W., Washington, D. C., $2.

Dr. Wernher von Braun observes test firing through blockhouse periscope.

Dynamic Test Stand will hold complete Saturn V during tests.

Marshall Space Flight Center is

GROUND TESTING A MOON BIRD

By WILLIAM B. SHEIL

A VAST RUMBLE and pillars of smoke and steam periodically rise above Huntsville, Alabama, as America moves toward its goal of putting men on the moon. These fireworks are evidence of the struggles of a tethered moon bird—evidence of tests of the world's largest rocket booster, the Saturn V's S-IC. The work is being done at the National Aeronautics and Space Administration's George C. Marshall Space Flight Center.

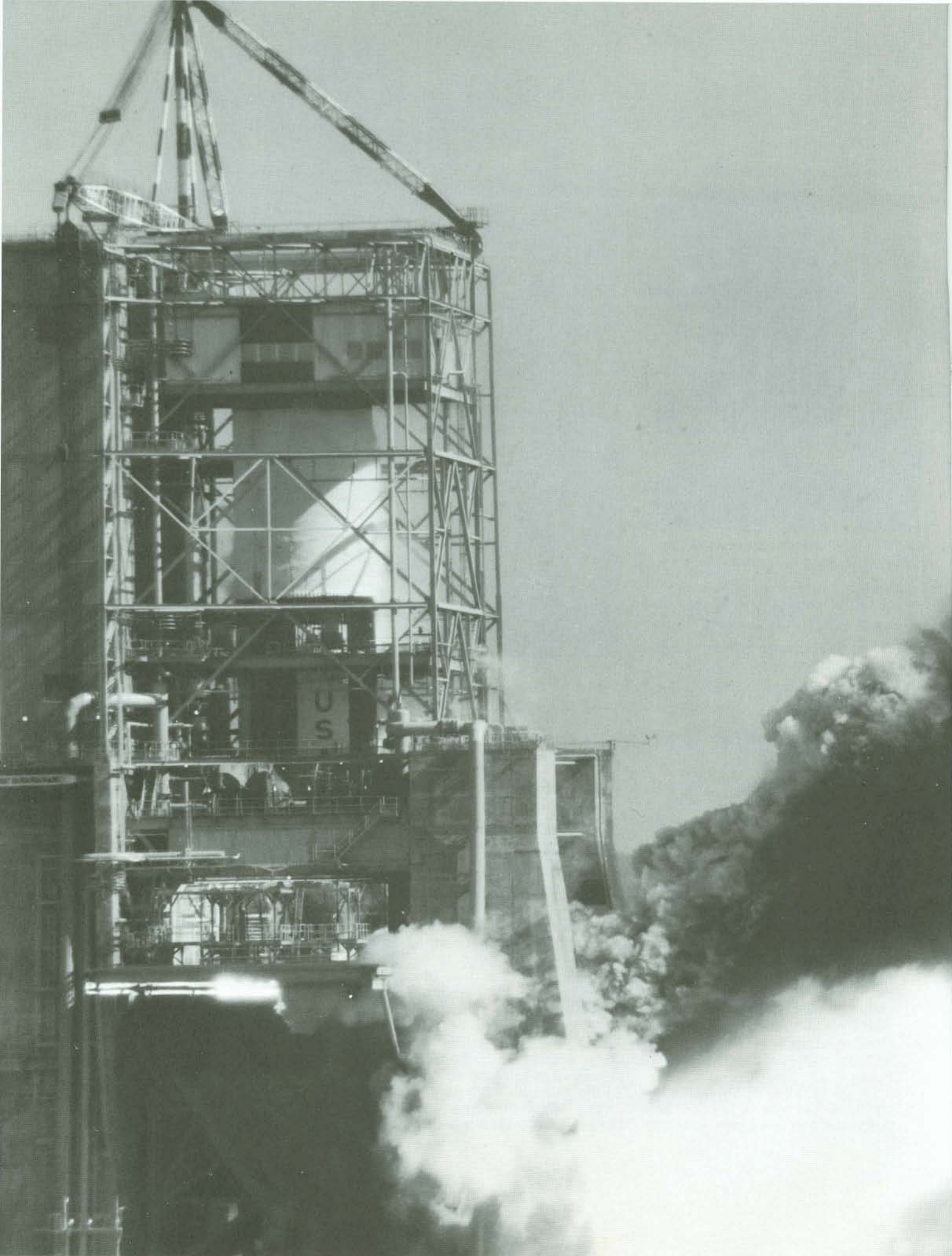
In one section of the sprawling test area the S-IC is cradled in a giant steel test stand atop four massive concrete legs, where it is being static fired to prove the design of the booster's propulsion system.

Five full-thrust tests have been conducted. The longest was for 90 seconds. A test for 2½ minutes, approximately full-flight burning time, is scheduled for July, 1965.

The S-IC, which was placed in the 400-foot stand March 1, is 138 feet long and 33 feet in diameter. It is the first stage of the three-stage, 364-foot Saturn V/Apollo vehicle, scheduled to launch three American astronauts on their way to the moon by 1970.

The Marshall Center and Boeing are jointly developing and testing the S-IC. Most major components were built by Boeing at Marshall's Michoud Operations in New Orleans and at Boeing's Wichita, Kansas, facility. Later phases of the static test program will be conducted at Marshall's Mississippi Test Operations in Hancock County, Mississippi.

Powered by five F-1 Rocketdyne engines burning liquid oxygen and kerosene, the S-IC generates 7.5 million pounds of thrust, roughly the equivalent of 160-million horsepower. That's comparable to a string of automobiles running at full throttle bumper-to-bumper from Seattle, Washington, to New York City.


US

In a section of the Marshall Center called the Load Test Annex, Boeing engineers are running simulated captive firing tests of a second S-IC booster to check various sections of the vehicle for loads expected during later phases of the test program.

The Load Test Annex is equipped with an upper platform which has a load-reaction capability of 30,000,000 pounds. The 1,800-ton platform can be lowered onto a rocket section for weight-bearing tests. One test simulates the 1.5 million pound force of a single F-1 engine firing at full thrust; a second simulates the full 7.5-million-pound five-engine thrust without gimbaling the four outboard engines for control purposes; a third is a full-thrust, full-gimbal run, and a fourth experiment concentrates on center engine rebound, in which hydraulic force is applied to the stationary single center engine only.

At the Marshall Center Dynamic Test Stand, Boeing is performing engineering service on the dynamic test program, as well as supplying instrumentation equipment for the stand. Tests at this site will determine the bending and vibration characteristics of the complete Saturn V/Apollo vehicle. The tower's steel superstructure is some 360 feet tall and 98 feet square. Assembly of the moon bird in the dynamic test vehicle is scheduled to begin before the end of the year and the test program should get under way in February, 1966.

On September 27, 1965, the first S-IC flight booster will roll out of Marshall's Manufacturing Engineering Laboratory. Following assembly and checkout, the booster will be shipped to Cape Kennedy in July, 1966.

At the Cape's Launch Complex 39 the booster again will be checked and then mated with two upper stages and a space capsule. Following a series of extensive ground tests on the entire vehicle, the first launching of an unmanned Saturn V/Apollo will occur during the first half of 1967.

Nobody is more keenly aware of the numerous target dates on this vast program than Dr. Wernher von Braun, director of the Marshall Center. Dr. von Braun recently commended R. H. Nelson, Boeing Launch Systems Branch manager, for the company's efforts in putting the program ahead of schedule.

Dr. von Braun wrote, "On behalf of the Marshall Space Flight Center, I wish to express my appreciation to you and the members of your team for your outstanding efforts and assistance on the S-IC program. Our successful five-engine captive firings of the first-stage booster this year mark a major milestone in this nation's progress toward placing a man on the moon in this decade. The fact that we are presently ahead of schedule is directly the result of dedicated men working together toward a common goal.

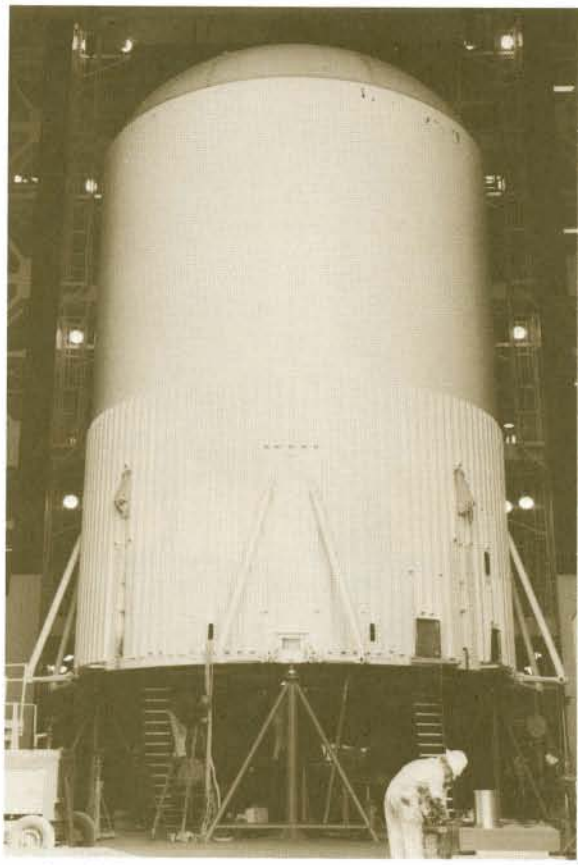
"We at Marshall Space Flight Center are well aware of the many difficult and essential tasks performed by the Launch Systems Branch in support of this accomplishment. In retrospect, they are a tribute to all the men in your organization and will serve as an inspiration to all of us in the tasks that lie ahead.

"Please express my personal thanks to your personnel for a job well done."

Everything about Saturn V is measured in superlatives. There are valves as big as suitcases, fuel pumps bigger than refrigerators, and engines as large as 2½-ton trucks. Flying it will be like putting the Washington Monument in space. The rocket is five to six times as powerful as anything the Russians have unveiled to date.

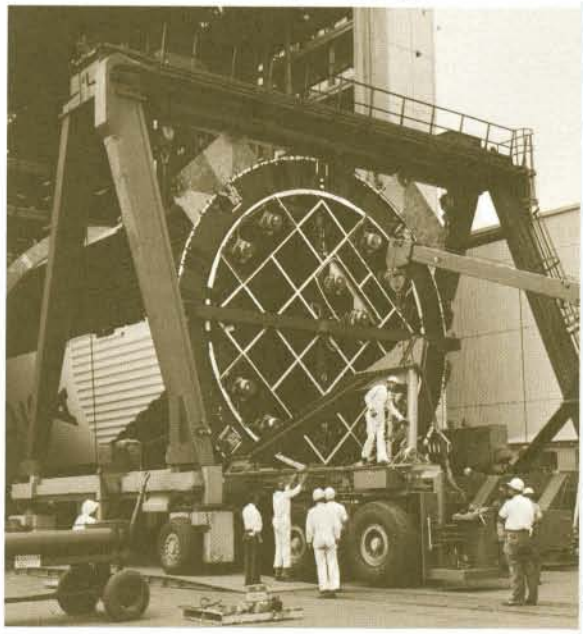
Engineering standards on the program are unprecedented. An ascending scale of difficulty may be illustrated by noting that an automobile should keep out rain at 100 miles an hour; a Boeing 707 has to be watertight at 650 miles an hour and strong enough to withstand collision with birds and other small objects in the air, and the Saturn V/Apollo must withstand the impact of pieces of space dust at speeds up to 25,000 miles an hour.

Testing is the key for the whole program. The work being accomplished at Marshall today will help ensure the vehicle's performance on the round trip to the moon.



Load Test Annex has upper-load platform which weighs 1,800 tons.

Transporter moves S-IC booster into Vertical Assembly Building.



All five engines of Saturn V's S-IC booster fire simultaneously in test.

Olympic Airways jetliners will provide daily service

BY AIR TO ATHENS

This ancient sculpture is on the terrace of lions, island of Delos.

By THOMAS COLE

THE RUGGED mountains and isle-studded seas of Greece, bars to invading armies and graveyard of hostile fleets from time immemorial, are losing their terrors—at least for friendly tourists bent on sun-soaking, history, fine foods and romance in approximately equal parts. Modern jet aircraft have done the trick and Olympic Airways, comparative infant among the world's leading airlines, is the magician.

Only eight years old, this airline has become a factor in long-distance air service by the purchase of three Boeing 707-320C intercontinental-range jet airliners and announcement of a future service from New York to its storied homeland. Olympic's first Intercontinental is scheduled for delivery on May 10, 1966, with a second delivery due two weeks later. Beginning of the transatlantic service has been announced for May 31, 1966.

Late in May of 1965, the airplanes' interior configuration and exterior color schemes were selected by Aristotle Onassis, internationally famous shipping magnate and owner of the airline. The new exterior design will feature an elongated white-on-blue Greek flag with a wave in it just above the forward window line and a blue bar along the window line which will widen to cover the entire underside of the tail section. The vertical tail will be all blue with the airline's six-ring insignia standing boldly on it. All blues will be somewhat lighter than on other Olympic planes.

Olympic' unusual goal is to complete its crew-training program by the May 10 first-delivery date. Schedules call for 32 pilots and 16 flight engineers to go through four weeks of ground school, about two weeks of simulator training and then through flight transition in a 707-320C already in operation.

These training periods must be staggered because only a minimum number of crews may be away from day-to-day airline operations at any one time. Current plans are for supervisor-crew training this summer and line-crew training to begin about October.

This close scheduling shows the airline's confidence in its own competence, developed since its first scheduled flight on April 6, 1957, from Athens to Salonica. Olympic Airways was born early in 1957 under the terms of a 20-year contract between the Greek government and Onassis, perhaps the world's foremost shipping magnate. In October, 1962, Onassis and the Greek government signed a revised agreement giving Olympic Airways certain exclusive franchises for 24 years.

The airline began with 14 DC-3s, one DC-4 and one Fairchild Argus which Onassis took over from the government-owned National Greek Airlines. He immediately began a program of expansion and modernization. The airline's current fleet consists of 5 Comet jets and about 12 piston-engine airplanes.

The airline's new Boeing jets will carry 143 passengers in 20 first-class and 123 tourist seats, plus a lounge that will seat six. The big planes, with a design range of more than 6,000 miles, will fly between Athens and New York daily, stopping alternately at Paris and at Rome. They will be the most modern long-range jets available.

Major cities served by Olympic include Athens, Rome, Paris, Lon-

Aristotle Onassis, Olympic Airways' owner; S. Damaskinos, general manager (left), and M. Tombras, associate director, are photographed at the Athens Airport.

don, Zurich, Frankfurt, Amsterdam, Istanbul, Nicosia, Beirut, Tel Aviv, Cairo and Brindisi. In addition, the airline's domestic network links Athens to 19 other Greek towns and islands. Last year more than 150,000 Americans visited Athens.

Greece is about half the size of Colorado, but has a coastline longer than Spain and Portugal together. The population of Greece is slightly more than that of New York City.

Every year Greece becomes more popular as an all-year-round vacation land because of its mild, dry climate, miles of beaches and waterfront, relatively low cost of living, masterpieces of ancient art and architecture and a history the glories of which will be sung forever.

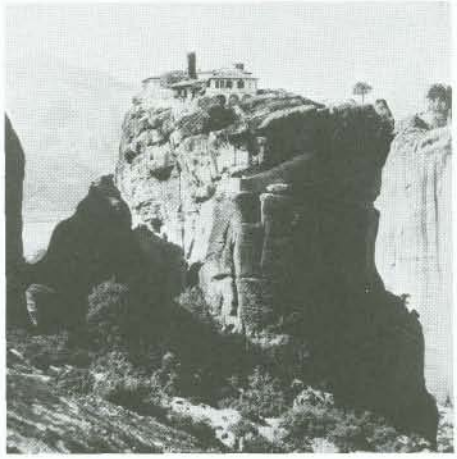
Every school child knows of the heroic warriors of Sparta, Athens and Corinth who stood together against the Persian armies at Thermopylae and Marathon more than 20 centuries ago. None will forget Alexander the Great, who conquered the world and wept because there were no more worlds to conquer.

In our times, Greek soldiers fought beside the allies in both world wars and in Korea. Now the country is part of NATO and the United Nations.

Greece's first commercial air transport venture, founded in 1931, met its demise during World War 2 when all its aircraft were taken over by the Royal Hellenic Air Force. After the war, two Greek airlines offered commercial service. In 1951 they merged with a third operator to form National Greek Airlines. Four years later, this company encountered financial difficulties which resulted in its being taken over by the government. It was the assets of this company which Onassis took over in 1957.

Now Olympic calls itself "One of the youngest airlines representing one of the oldest civilizations in the world." It has a continuous program of training for its aircrews, technical personnel and cabin staffs. Stewardesses must have knowledge of at least two foreign languages.

The airline prides itself on its reputation for service and widely circulates a written slogan: "Friendliness isn't our business—it's our nature."



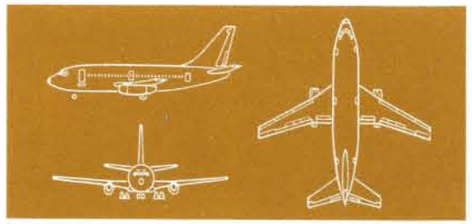
Monastery sits high in Thessaly.

Erectheum is part of Acropolis, Athens.

Artist's concept shows Olympic Airways' markings on 707-320C.

Colorful uniforms are traditional.

Acropolis stands above modern Athens.



TWINJET TWINS

WHICH TWIN is shown in this picture? It happens to be the 737-200, but the only way you can tell is by counting the windows. The 737-200 has 33 windows, three more than its twin, the 737-100.

There are a few other differences—important ones to an airline operator. The 737-200 is six feet longer and will seat 15 more passengers than the 737-100. But the —100 has a greater maximum payload and longer range. So the customer has a choice.

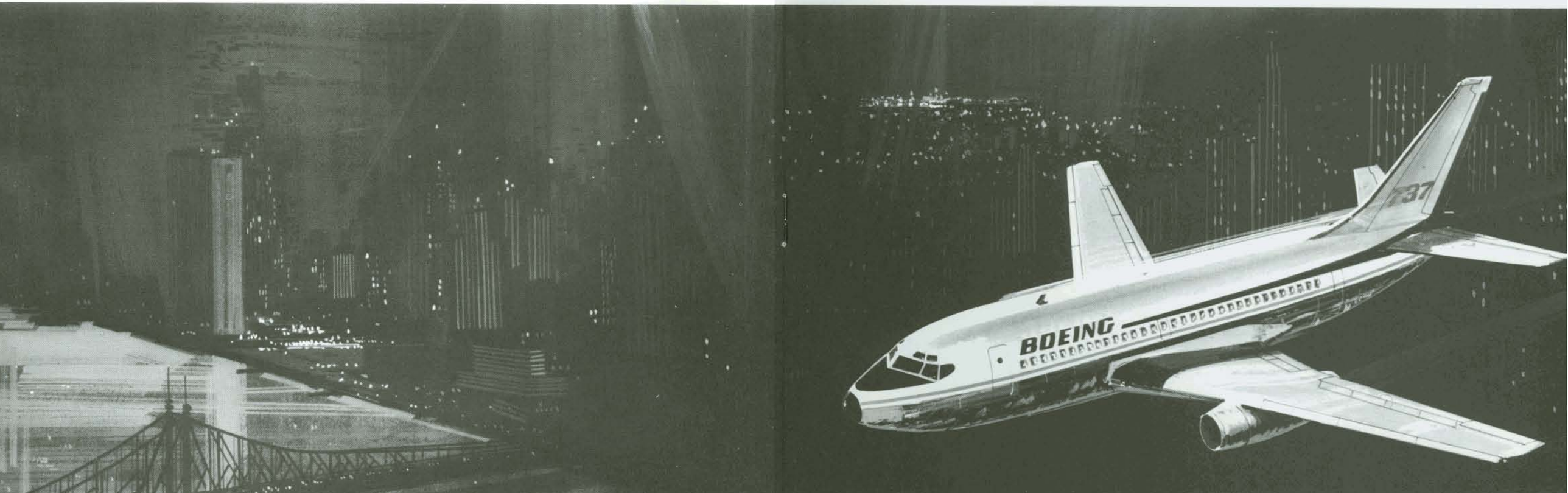
Both 737s will operate from very short fields, in small towns or large. And as far as interior size and appearance are concerned, a passenger will have a hard time telling whether he's in a 737, a 707, a 720 or a 727—they're all the same except for length.

Comparative specifications for the 737 twins follow:

	737–100	737–200
Dimensions:		
Wingspan	89 feet	89 feet
Overall length	94 feet	100 feet
Fuselage length	90 feet 7 inches	96 feet 7 inches
Height	37 feet	37 feet
Fuselage width	12 feet 4 inches	12 feet 4 inches
Wing sweepback	25 degrees	25 degrees
Maximum gross weight:	93,500 pounds	93,500 pounds
Landing weight:	89,000 pounds	89,000 pounds
Power:	Two Pratt & Whitney JT8D turbo fans rated at 14,000 pounds thrust each	
Cruising speed:	575 miles an hour	575 miles an hour
Cruising altitude:	25,000 feet	25,000 feet
Operational ceiling:	35,000 feet	35,000 feet
Range:	1,150 miles *1,895 miles	1,070 miles *1,460 miles
Passenger capacity:	76-100	90-115
Payload:	30,000 pounds	28,600 pounds
Fuel:	2,850 U.S. gallons with optional tankage up to 4,000 gallons available	
Landing gear:	Tricycle: Dual wheel units	Tricycle: Dual wheel units
Crew:	Two: Pilot and co-pilot	Two: Pilot and co-pilot

*With optional fuel tankage

Illustration by Warren McCallister



Unique system makes possible precise alignment of long aircraft bodies.

ON THE BEAM

By WESLEY ROBINSON

A BEAM-OF-LIGHT alignment system which can locate tooling jigs and airplane body sections faster and easier than ever before has been developed by Boeing engineers. The system will be used to build jet transports longer than any previously made. Such long-distance precision alignment was thought impossible until now.

The new system is unique because of its use of an axicon mirror developed by the Eastman Kodak Company. The mirror reflects a beam of light at precisely the same angle as that at which it is received.

Two instruments are used. One throws a thin beam of light from an aligned-light projector. This beam of light strikes an axicon mirror in a second instrument, placed some distance from the first. The light beam is reflected back to the first instrument.

In operation the first instrument is set up to throw its light beam parallel to the horizontal line of the airplane body. The second instrument may be attached to the jig at any point where a precise reference beam of light is desired. When the light beam from the first instrument strikes the exact center of the axicon mirror in the second instrument, the beam is reflected to the exact center of a receiving lens on the first instrument. The instrument containing the axicon lens may be moved as required until the light beam strikes its exact center and the precise reference beam is established.

Great accuracy is obtained. Tested over distances of 180 feet, deviations as small as 1/1000 of an inch were readily observed and corrected. The beam-of-light alignment system is six times as precise as any method now in use. The system will operate over very long distances with no apparent loss of precision.

Should an assembly tool be misaligned, the degree of deviation will be indicated automatically on a console Boeing is developing. Photoelectric cell quadrants in a target assembly will be mounted on jig components to intercept light reflected from the axicon mirror.

As long as the light beam passes through the center of a target, a zero reading will register on readout equipment, indicating perfect alignment. Beams will shine continuously while work is in progress. If a beam is deflected, however slightly, by a misaligned component, two dials on readout equipment will register the amount and direction of deviation.

The beam-of-light method is the logical way to line up sections of an extended-fuselage plane or a large cargo jet, according to Howard E. (Bud) Hurst, Boeing C-5A operations manager. Alignment will be simple and fast, as the person doing the work will be at the spot where adjusting is done.

"Old alignment techniques simply cannot produce the accuracy which will be required at the distances covered by these large fuselages," Hurst said.

The axicon alignment system is only one of the optical advances in tooling Boeing has made recently. Another is a three-directional square which permits a perpendicular alignment in three directions without moving the square (see "Three-Square Look-See" in April, 1965, *Boeing Magazine*).

Boeing is ahead with its alignment techniques. Until now, industry has found little use for the axicon mirror—so little that Eastman quit making them.

A need for fifty or more of the mirrors is probable. Since this far exceeds the number currently available, Boeing is seeking a manufacturer to grind the axicon mirrors. Permission to do this has been obtained from the Eastman Company, which holds patents.

Axicon alignment system parts include light source and eyepiece (right) and axicon mounting tube (left) containing the mirror.

This installation provides electricity, heat and air conditioning for Southern California Gas Company's office building in Downey.

Small gas turbine engine sets record

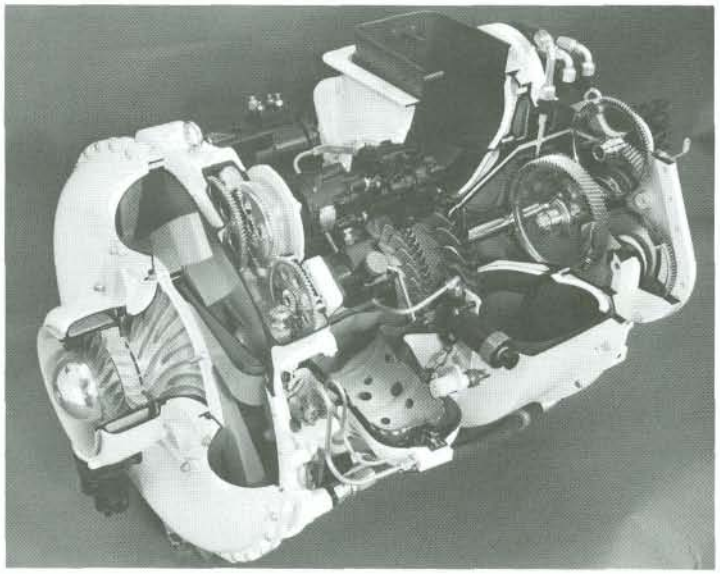
15,000 HOURS BEFORE OVERHAUL

By ALLEN HOBBS

WHEN a small turbine engine completes more than 15,000 hours of operation before requiring a major overhaul, it's news because very few small turbines have been installed for continuous industrial service. The first small turbine to achieve an operating record of such length is a Boeing natural-gas-fueled engine. Two of these turbines recently were put back into service after undergoing their first factory overhaul.

The two engines were installed in late 1962 as part of a joint Boeing and Southern California Gas Company evaluation of an on-site power system. In the gas company's office building at Downey, California, the turbines drive electrical generators and the engines' exhaust heat passes through boilers which supply steam for heating or for operating an air conditioning unit.

New 551 turbine is rated 300 hp for continuous service.



When the installation was made, it was the world's first application in an office building of gas turbine engines as the sole source of electricity, heat and air conditioning.

A main purpose of the evaluation was to determine the maintenance requirements for small gas turbine engines in this type of continuous service. Results from the highly successful project will contribute significantly to small turbine development for long-life applications.

Operating times on the engines at the date of their removal for factory overhaul were 15,222 hours and 9,351 hours. One engine has fewer hours since it is operated only during periods of peak electricity demand.

During the overhaul the engines were uprated in power to enable either of the turbines to carry the full electrical load alone. The second unit will serve as standby power.

The operating record proves that the installation could be a practical solution for high power costs in many areas.

First Minuteman II is lowered into silo at Cape Kennedy for firing.

A new program gets under way —

MINUTEMAN MODERNIZATION

By E. H. BOULLIOUN
Boeing Vice-President, Gen. Mgr. Missile Branch

THE United States Air Force Strategic Air Command will be armed with the most effective missile system available when the Minuteman modernization program is completed.

In simple terms, the modernization program entails replacement of the older-model Minuteman intercontinental ballistic missile with a new one of improved capability, the Minuteman II. Eight hundred Minuteman I missiles will be replaced under the program recently announced by the Air Force Systems Command Ballistic Systems Division, the agency managing the Minuteman program.

The development of such a program was not simple. Since delivery of the first Minuteman at Malmstrom Air Force Base, Montana, nearly three years ago, BSD, Boeing (system integrator) and other Minuteman associate prime contractors have developed literally hundreds of improvements for the missile. Many of these improvements were applied as each of the first five wings were readied for delivery. Large-scale improvements were accumulated for a definite model break.

It was apparent that an improved system would provide greater flexibility for a controlled response in the event retaliatory action should be required. Decisions were made to employ the improved system at the sixth Minuteman wing, near Grand Forks Air Force Base, North Dakota, then to apply the new system to existing launch sites.

The improvements will be incorporated during the initial installation, assembly and check of the Grand Forks wing, which will become the 321st Strategic Missile Wing, and the fourth squadron at Malmstrom, where 50 additional missiles will be emplaced.

Brig. Gen. John L. McCoy, deputy commander of BSD for Minuteman, said, "Minuteman has proved to be our most reliable and advanced ICBM. Since it constitutes the backbone of our deterrent missile force, it is logical we should protect this sizable investment by updating and modernizing."

Improvements incorporated in the Minuteman II system compared to Minuteman I are: increased range and azimuth for the missile to provide greater targeting coverage, a more sophisticated guidance system capable of pre-storing the addresses of a larger number of alternate targets, increased accuracy and larger payload capacity.

Designs have been developed to make existing Minuteman facilities compatible with the newer missile. New ground equipment has been developed to support the improvements. In many cases, equipment designed for the sixth wing will fill these needs.

Boeing's experience as integrating contractor for the first five missile bases has produced a well-coordinated organization of trained personnel. The progress of the Minuteman organization toward maximum efficiency can be traced in records of the bases already completed. Each successive base was delivered with fewer problems and schedules were met more easily. This accumulation of experience will be applied to the modernization program.

More complex logistical situations will face the Air Force Site Activation Task Force and Boeing at each site during modernization than were present during initial installation. Equipment in present launch facilities will have to be carefully disassembled before the facilities are reworked to accommodate the new systems. Boeing will share disassembly work with SAC.

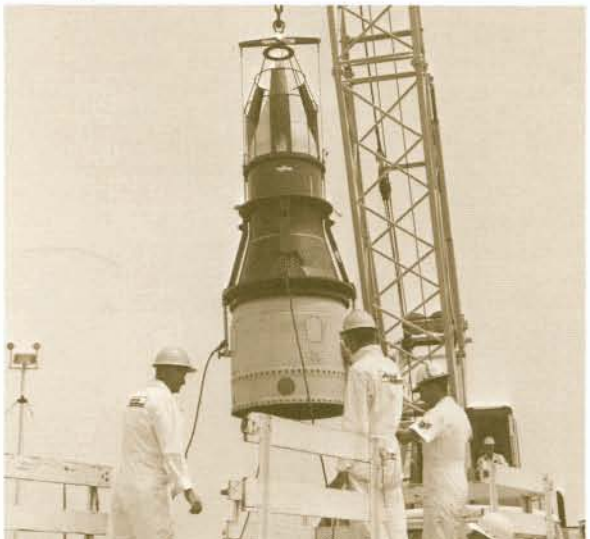
Part of the increased logistical complexity results from a need to protect and store equipment which is removed. The Minuteman I equipment is not obsolete, and, although no definite further use has been announced, it doubtless will be valuable in future programs.

The disassembly and assembly and checkout process will be started at the 351st Strategic Missile Wing, Whiteman AFB, Missouri. Robert M. Severide, Boeing base manager there during assembly and checkout of the Minuteman I, again will direct operations.

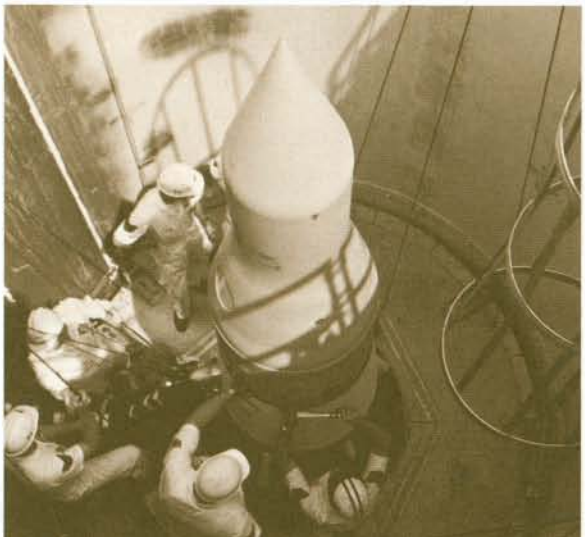
As the program is now defined, Boeing will start assembly and checkout of another location upon completion of the entire 351st wing. Modernization of facilities at Malmstrom; Ellsworth AFB, South Dakota; Minot AFB, North Dakota, and Warren AFB, Wyoming, will follow that at Whiteman.

Sixth straight successful Minuteman II firing is made at Cape.

Reentry vehicle is lowered into silo . . .



. . . and fastened at top of Minuteman II.



MILLER IN MOTION

TO SAY THAT Robert L. Miller has cut a wide swath through the town of Derby, Kansas (population 6,763), is very nearly literally true. As a member of the town council he helped to convert the worn-out main street into a wide and handsome thoroughfare.

Not far away is an elegant new church which was designed, financed and built while Miller was on the church board. He likes the look of progress in architecture as well as in streets.

In these projects and others, Miller beat the drums for sound quality, on the surface and beneath it. This might be expected, as he is director of quality at the Wichita Branch of Boeing's Military Airplane Division. Miller, his wife and their three youngsters enjoy living in suburban Derby, near Wichita, where they can take a personal hand in community affairs.

Miller's recent promotion to the quality-control post, at age 38, allows his quiet energy to be felt in a 730-man organization. "He works with a lot of dynamics," says an associate, "but with no display."

Midway in his 16-year career with Boeing Miller spent three years of hustle-bustle travel among Boeing vendors, spreading the gospel that quality in airplanes is far more urgent than quality in anything else. His success led to a series of nine promotions in the nine years that followed, including two key assignments at Seattle. Back in Wichita in 1963 Miller was named quality manager for Saturn V and, later, quality manager for factory operations.

In a recent talk to his management organization, Miller said his key word was a short one: desire. "It's one of the strongest driving forces in this world," he said. "It makes great athletes; makes people overcome all sorts of hardships and handicaps; makes people independently wealthy."

Miller's interest in progress is never too urgent to keep him from listening carefully to what the other fellow has to say.

Currently Miller is one of the managers of the Pee Wee baseball team in his community. He listens to what the kids have to say, too.

SAC pilot sets record.

TEXAS CHAMP

By DARRELL BARTEE

Lt. Col. Herbert A. Mailander has most hours as B-52 pilot.

LT. COL. Herbert A. Mailander has flown the equivalent of more than 100 times around the world in Boeing B-52 bombers. Colonel Mailander, commander of the 764th Bomb Squadron, 461st Bomb Wing, Amarillo Air Force Base, Texas, recently passed a milestone of 5,374 flying hours in B-52s and expects to be near the 6,000-hour mark by late summer.

This record gave him the title of "flyingest" B-52 pilot in the Strategic Air Command on June 29, 1965, date of the 10th anniversary of the entry of B-52s in service.

Colonel Mailander piled up his flying hours in wild northern blizzards as well as in Texas sunshine. His first extensive experience with the B-52 began with the 42nd Bomb Wing at Loring AFB, Maine. Later he piloted newer models of the bomber with the 28th Bomb Wing at Ellsworth AFB, South Dakota. His most recent hours have been logged with the 4128th Strategic Aerospace Wing and the 461st at the Amarillo base.

A native of Wisconsin, the colonel has been flying for 31 years. He started with light civilian propeller airplanes and worked up to the 8-jet intercontinental bombers. He had nine years of flight experience before he joined the Air Force in 1943. He has logged more than 16,000 hours in all airplanes, including considerable experience in B-36s, B-29s, C-54s, C-46s, C-47s and various trainers and civilian aircraft.

Important to the champ from Texas is the fact that he heads an airborne family. Two sons, Gary, a lieutenant in the Navy reserve, and Darryl, in graduate school, have private licenses. A third son, Mark, recently graduated from high school.

Colonel Mailander has flown B-52s more than 2.6 million miles. Asked for an opinion of the airplane, he said, "About the easiest, most accurate and shortest comment I can make is, it's terrific."

The Boeing 727QC carries passengers by day,

cargo by night. Conversion time: 30 minutes.

The 727QC is a *quick-change* jet designed for round-the-clock utilization.

During the day — when people prefer to fly — it's the luxurious, phenomenally popular Boeing 727 jetliner.

During the night — when cargo must be moved — it adds high-profit *extra* hours of utilization by serving as a rugged, capacious freighter. In this role, the 727QC can carry more than 35,000 pounds of cargo on eight preloaded pallets.

Conversion time from luxury passenger liner to jet freighter, or any combination configuration: less than 30 minutes.

The convertible 727QC enables airlines to develop the potential of the short-haul cargo market without adding cargo aircraft to their passenger fleets. Since it uses the same pallets and handling systems, and has as large a cargo door as the biggest jets, loads can be quickly transferred from the 727QC to long-range jet freighters.

The 727QC can provide a profitable feeder cargo service and an efficient link with major trunk cargo networks. This is a new profit dimension added to the 727 — a jet that, during its first year in service, set records for reliability, and earned more praise from passengers, pilots and airline managements than any new airliner in years.

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