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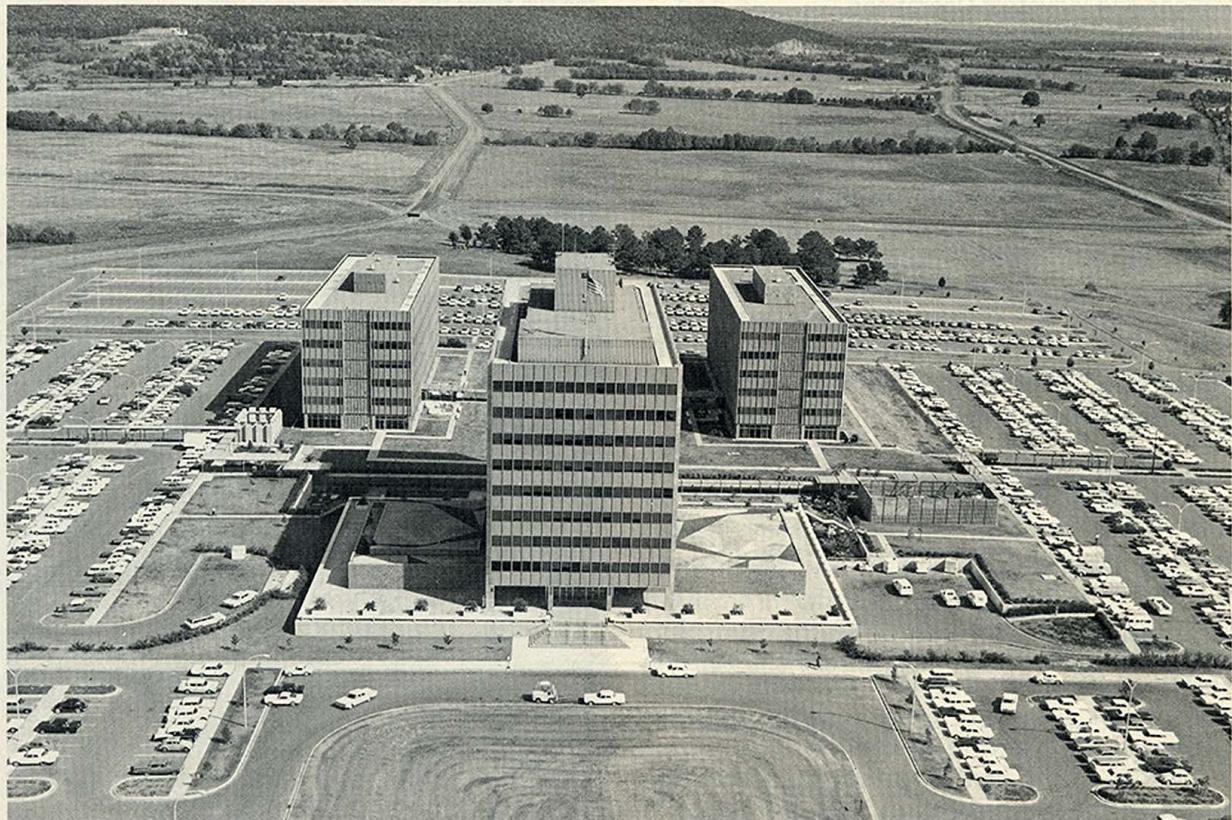
Marshall Space Flight Center

HUNTSVILLE, ALABAMA

Development of large launch vehicles such as Saturn V and spacecraft for deep space and near-earth missions and studies of future space exploration projects are the prime responsibilities of the Marshall Space Flight Center. Named for General George C. Marshall, the Center is National Aeronautics and Space Administration's largest installation.

The joint responsibility of its more than 7,000 employees is the development of large rockets, and the development of spacecraft such as the Orbital Workshop which can sustain astronauts on missions of up to 58 days. Marshall Center scientists and engineers have designed many of this country's rockets, including the Redstone, Jupiter, Saturn I, Up-rated Saturn I and Saturn V. They are presently lay-

These three modern office buildings house more than 2,000 employees of the NASA-Marshall Space Flight Center. The center building is a nine-story structure which contains the offices of MSFC Director Wernher von Braun and other key officials. It was completed in 1963. The two six-story structures were completed in 1964 and 1965.



ing the groundwork for the Apollo Applications Program which will use the Apollo elements for other manned missions in earth orbit. The future program will exploit the investment in the Apollo program by applying its wide range of capabilities to a number of other potential missions. The Orbital Workshop is a part of this effort.

A CHANGING ROLE

Marshall earlier had the capability of developing and manufacturing launch vehicles almost entirely within its own facility. This work was done in several major laboratories and manufacturing facilities. To maintain its role in the ever-expanding space exploration picture, the Marshall Center organization has adjusted to a changing role. While the Center still maintains its strength in the technical expertise of the space team built up in its major laboratories over the years, management has taken into account the fact that its space assignments are now too big to be handled in-house. As a result, to a much larger extent than before, work on the Saturn rockets and other missions is performed by industry through a series of prime contracts.

The two major organizational elements of the Marshall Center are Research and Development Operations and Industrial Operations.

Industrial Operations' program offices serve as management centers to administer contracts to private industrial firms who assist with Marshall Center missions. These offices must see that all the various components and stages are built to specifications and will work together when assembled into complete vehicles.

It is the responsibility of Research and Development Operations to insure that the Marshall Center remains expert in the basic aspects of space technology. Industrial Operations provides the capability of managing the efforts of industry.

OTHER FACILITIES

Industrial Operations also directs two government-owned facilities that extend the manufacturing and testing capability of the Marshall Center: Michoud Assembly Facility in New Orleans, Louisiana, and Mississippi Test Facility located in Hancock County, Mississippi. Although located in separate states, the two installations are only about 45 water miles apart. Both are linked with the Marshall Center by water routes traveling over the Mississippi, Ohio and Tennessee rivers.

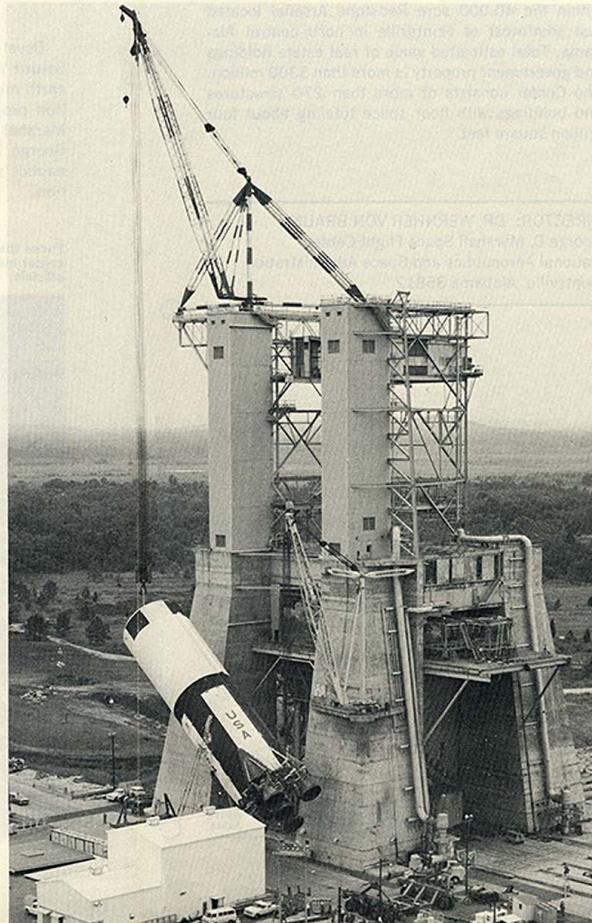
Michoud is the production site for rocket first stages for the Upgraded Saturn I and the Saturn V.

Michoud's manufacturing building is one of the largest single-floor buildings in the country, covering almost 43 acres. It is 15 miles east of downtown New Orleans and located on the intracoastal water route.

Mississippi Test Facility provides the rocket-testing stands, test control and support units, laboratories, and an industrial complex capable of acceptance testing both the first and second stages

A Saturn V flight booster (S-IC-2) is shown being hoisted into place at the NASA-Marshall Space Flight Center for testing. The 300,000 pound stage was assembled at the Marshall Center by MSFC and the Boeing Co. The stage is 33 feet in diameter and 138 feet long. Its five Rocketdyne F-1 engines produce a total of 7.5 million pounds thrust. The Marshall Center has captive fired a ground test version of this booster some 15 times and static fired the first S-IC flight booster twice.

An engineer examines an Apollo Telescope Mount model included in a cluster of Apollo Applications payloads. The ATM is to be a manned solar observatory to give scientists a look at the sun above the earth's atmosphere. Elements of the cluster include the Apollo spacecraft, top, mapping and survey module, left, Saturn I-IVB orbital workshop, bottom, and the ATM. Large panels on the ATM and the S-IVB orbital workshop depict the solar cell arrays to provide electric power for stays in space of a month initially.



of the Saturn V. The central test area of 13,427 acres is surrounded by a sound buffer zone (128,526 acres). Through a series of canals, the large rocket stages can be lifted directly from barges onto the test stands at the Mississippi site.

Industrial Operations presently has five program offices. These are:

1. Saturn I and Upgraded Saturn I
2. Saturn V
3. Engine Program Office
4. Mission Operations
5. Saturn/Apollo Applications

Industrial Operations has a group of staff offices that include:

1. The Contracts Office
2. Facilities Projects Office
3. Project Logistics Office
4. Resources Management Office

RESEARCH AND DEVELOPMENT OPERATIONS

Eight major laboratories in Research and Development Operations perform the basic functions of design, development, fabrication and testing of launch vehicles and payloads. Research and Development Operations also provides in depth technical support to contractor operations.

R&D Operations has four offices and eight laboratories. The four offices are:

Advanced Systems Office—Advanced space technology for future space flight systems.

Technical Systems Office—Overall systems engineering in support of Saturn program.

Experiments Office—Development and management of in-house experiment activities.

Operations Management Office—Resources management and the coordination of technical support to Industrial Operations.

The eight laboratories are:

Aero-Astroynamics—Rocket shape and design, aerodynamic flow and stability, trajectories, flight evaluation and performance.

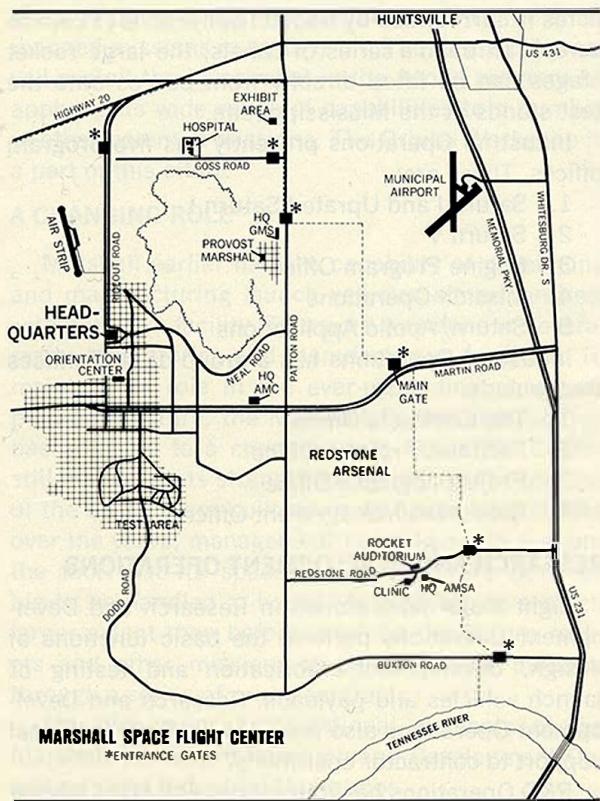
Astrionics—Guidance, control, and communications, power supplies, electrical networks, tele-metering equipment.

Computations—Computation, simulation, and data reduction in related space fields.

Manufacturing Engineering—Large structures fabricated and assembled. Prototype boosters, space vehicles produced.

Propulsion and Vehicle Engineering—Structures, mechanics, propulsion vehicle systems, systems integration, and materials.

Quality and Reliability Assurance—Performance



of space vehicles is assured through checkout before and after test firings.

Research Projects—Scientific research of new concepts in specified fields and studies of possible future programs.

Test—Experimental and developmental testing programs of launch vehicles, components, and other systems.

PHYSICAL DESCRIPTION

Marshall Center consists of about 1,800 acres within the 40,000 acre Redstone Arsenal located just southwest of Huntsville in north-central Alabama. Total estimated value of real estate holdings and government property is more than \$300 million. The Center consists of more than .270 structures and buildings with floor space totaling about four million square feet.

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