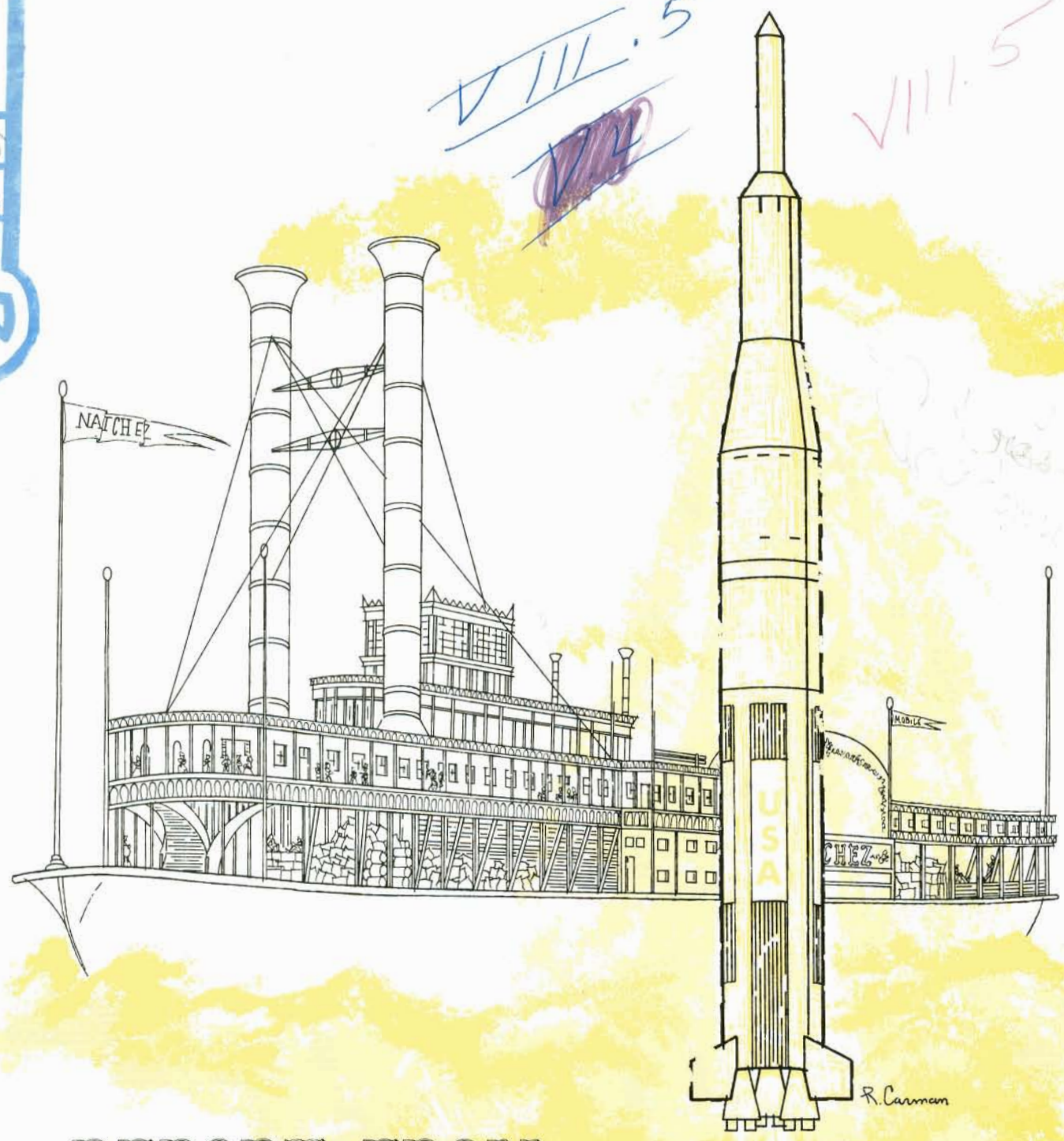


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REPORT FROM MISSISSIPPI

GE Challenge

NASA's Mississippi Test Facility, a \$300 million rocket proving ground, is very much in business today. And MSD's Mississippi Test Support Department plays a vital supporting role in that business . . . the business of testing the gargantuan stages of the Apollo-Saturn moon rocket.

Spring (March) 1967

Take one look at the place, and you'll find it hard to believe that this was wild, desolate swamp land, barely four years ago. In May 1963, this remote section of southwest Mississippi was virtually a ghost town. But engineers moved in, felled the cypress and the pine, and carved one of the country's most sophisticated technological centers out of the wilderness.

Take a look at the place and you'll note the pace hasn't slackened any. There's still plenty of work to do, and there are eager and dedicated people to get it done. But the activity at NASA's Mississippi Test Facility (MTF) today contrasts sharply with the land clearing and building construction of a few years back. MTF is very much in business—the business of testing Saturn V rockets which will take America's astronauts to the moon and back. And General Electric's many-faceted Mississippi Test Support Department (MTSD), headed by General Manager Bill Eaton, is very much in business too, playing a unique supporting role at the NASA facility.

The first flight version of the Apollo-Saturn-V vehicle's second stage rocket booster was successfully tested at MTF twice in December. This stage, the S-II-1, was later shipped to the Kennedy Space Center to be mated with other elements of the moon rocket for the first Apollo mission.

The second stage of the Apollo-Saturn V space exploration vehicle is the largest and most powerful liquid hydrogen stage under production.

Its part in the lunar mission will begin after the Saturn V's first stage, the S-IC, has boosted the three-man Apollo spacecraft to an altitude of about 40 miles. Then the five J-2 engines, each developing 200,000 pounds of thrust, will push the spacecraft to an altitude of about 100 miles.

The cylindrical stage is 81 and one-half feet long, has a 33-foot diameter.

During the December testing, the stage was held captive in a concrete and steel test stand, 200 feet high. Measurements of the stage's perform-

ance during the test were recorded by some 550 data channels, each carrying multiple signals, indicating events such as temperatures, pressures, flow rates, vibrations and thrust. The processed data will permit detailed evaluation of the stage's operation and predicted performance in flight.

Following the late December firing, Dr. E. F. M. Rees, Deputy Director Technical, NASA/Marshall Space Flight Center, said: "The successful captive firing of the Saturn V second stage was indeed a milestone in America's space program. This firing puts us a step closer to our Project Apollo goal of landing Americans on the moon and returning them safely before this decade is out. The test was a tribute to people here at MTF—Manager Jackson Balch, his NASA team, the North American test team, and the General Electric support effort that has worked in cooperation with the Marshall Space Flight Center in Huntsville—to bring the S-II out of the woods."

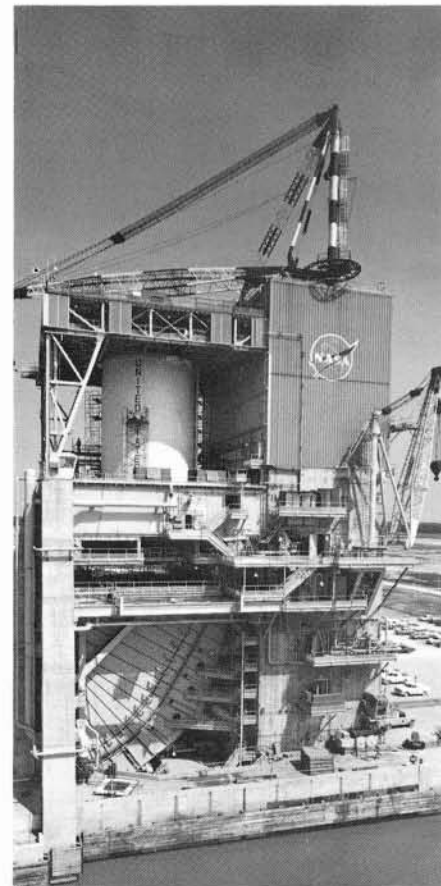
The next order of business was testing of the mighty S-IC booster, scheduled for February 1967. Of this test, MTSD General Manager Eaton commented: "This S-IC-T test will see MTSD mechanical operations and data operations people supporting an S-IC firing for the first time. This means new challenges for them, not the least of which will be the ability to support and react to two different test complexes—North America's second stage and Boeing's first stage."

But to reach this "we're in business" status, required management expertise on the part of Bill Eaton and his staff. It has required providing technical and plant support to a large government test complex . . . the organization and coordination of a wide range of services.

As prime support contractor for NASA/MTF, it is the Department's responsibility to furnish support services in every area needed to operate and maintain what is considered this country's largest and most complex center for ground testing rockets .



MTSD General Manager Bill Eaton surveys rocket test site.



This 200-foot high structure is the first completed rocket testing tower at MTF.

It has been MTSB's responsibility to set up, maintain and operate an intricate laboratory, electronics, communications and data processing complex to record and furnish information from each booster firing, from which NASA can determine the "flight worthiness" of rockets.

With each rocket test voluminous data is generated. The job of acquiring, handling and processing this data is the responsibility of MTSB, using equipment that handles 10,000 bits of data per second.

Commented Eaton, "The data analyzing equipment that we use here represents no advances in the state of the art, but even using familiar techniques, we must juggle two jobs at once. We have to set up for the static test firing itself, and prepare the equipment to handle the data generated by each test firing.

"In addition," he continued, "we have to administer the equivalent of a small electronically equipped and operated city, created for the express purpose of testing Saturn V stages."

With some 1,500 on the payroll, plus about 700 sub-contractor employees, MTSB operates and maintains every service required by the personnel on the site. These services include transportation, safety, security, mail, telephone, food, medical, graphic arts, communications—in short, everything needed to operate a modern complex of buildings, laboratories and test stands.

It all adds up to thousands of inter-related items. Try these statistics on for size: In one month, enough electrical power is consumed to supply 6,000 homes; natural gas used at the site exceeds 40 million cubic feet; approximately 120 million gallons of potable water is used. To transport test vehicles, propellants, materials and personnel, there are seven and one-half miles of canals with navigation locks and bascule bridge; 28 miles of railroads, and 35 miles of highways and roads. Some 600 miles of cabling snakes underground to connect test stands and laboratories. Provision is also made for the safe transport and storage of highly volatile propellants.

Some 10,000 items of identifiable work were involved up to and including the first test firing of the S-II-T alone.

The Mississippi Test Support Department has been re-aligned by Eaton, and its organization streamlined for current and future planning.

Heading up the sections are: Jack Picard, manager—Programs; Paul Sage, manager—Engineering Section; Tom Teague, manager—Logistics; Malcolm "Mac" MacGregor, manager—Relations; Herb Connelly, manager—Finance; Orrin Pilkey, manager—Test Support; Fred Kohl, manager—Community Programs; Arthur "Woody" Woodside, manager—Contracts; Bill Roy, manager—Site Services; Lucien Gex, counsel—Legal Operation, and Gene Wright, who heads the Malta Test Operation in Schenectady, New York.

The Mississippi Test Facility is under the direction of NASA's George C. Marshall Space Flight Center at Huntsville, Alabama, headed by Dr. Wernher von Braun. A small NASA group (numbering about 100), directed by Jackson Balch, has the overall management responsibility for the MTF site, and the vital task of evaluating all tests and issuing flight worthiness certificates to the stage contractors.

North American Aviation, Inc., is responsible for testing their second stage boosters on the S-II stands, while

the Boeing Company has the job of testing their first stage boosters on the dual S-IC stand. The Mississippi Test Support Department supports both the government agency and the stage contractors in all their activities at the site.

Take a look at the place today and you'll see more than 1,000 construction workers swarming over MTF, finishing up work on the second S-II test stand and the dual position S-IC stand. This simultaneous construction and testing of checkout equipment and rocket stages has been going on for some time now. MTF Manager Balch described it as "riding with one foot on each of two galloping horses." But, he added, "so far this seems to be working out unbelievably well."

Looking back over the months in which MTSB has played a major role in bringing the test site to an "in business" basis, Bill Eaton remarked: "The creation of this electronic wonderland of the South has not been without trial and tribulation, but it has been worth it. Since MTSB was first established in July 1963, our primary mission has been Project Apollo.

"All that has occurred here has been rehearsal for the business at hand—the business of booster testing. With the successful test firing during the closing days of 1966, we felt MTF had assumed its real role in the space program." ★



Workmen unload the S-IC-T at the Mississippi Test Facility. This test version of the gigantic Saturn first stage is transported to and from MTF on a barge.