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Monthly Review

3, 2, 1 --- Blast Off!

NASA's Impact on the District States

Buck Rogers has been around for a long time, but few people took him seriously until recently. After being confronted by a series of events ranging from "Sputnik I" to "Molly Brown," however, very few could harbor any doubt that we are now on the threshold of the space age. Although by no means common, space flight is a proven fact, and its terminology pervades many phases of our life. It's even said that our children learn to "count down" before they "count up."

The six-state area comprising the Sixth Federal Reserve District (Alabama, Florida, Georgia, Louisiana, Mississippi, and Tennessee) has not been left out of the space effort. Vital roles are played by several installations in this area, and the impact of the space industry on the region itself has been considerable. First, however, a little background about the space program in general.

NASA: Its Aims and Objectives

Space flight officially went into "orbit" with the appearance of "Sputnik I" on October 4, 1957. Although the United States had been conducting experimental work on space flight for some time, the Russian achievement gave a substantial boost to our efforts. On October 1, 1958, the National Aeronautics and Space Administration (NASA) was set up to coordinate and advance our exploration of outer space. The long-range objectives of NASA, as described in section 102 of the National Aeronautics and Space Act of 1958, were as follows:

- (1) The expansion of human knowledge of phenomena in the atmosphere and space;
- (2) The improvement of the usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles;
- (3) The development and operation of vehicles capable of carrying instruments, equipment, supplies, and living organisms through space;
- (4) The establishment of long-range studies of the potential benefits to be gained from, the opportunities for, and the problems involved in the utilization of aeronautical and space activities for peaceful and scientific purposes;
- (5) The preservation of the role of the United States as a leader in aeronautical and space science and technology and in the application thereof to the conduct of peaceful activities within and outside the atmosphere.

To accomplish these peaceful aims of space exploration, a number of laboratories, research centers, and government employees who had been working on the military aspects of rocketry were transferred to NASA. Beginning with about 9,000 employees and a relatively small budget of about \$145 million, NASA had more than tripled employment by fiscal year 1964, and expenditures had climbed to \$4,171 million, or about 4 percent of total Federal expenditures. Much of the increase resulted from President Kennedy's declaration in 1961 that space exploration was a major instrument of national policy. Currently, there are signs

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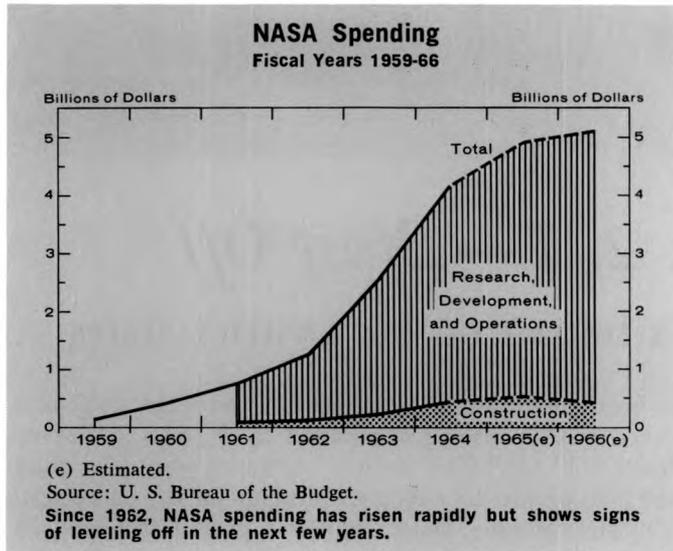
LOUISIANA EXPANDS ROLE
 IN ECONOMIC PERFORMANCE

SIXTH DISTRICT
 STATISTICS

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of a leveling off in the space program in the next few years, with employment and expenditure increases expected to be smaller than those occurring in most years since 1961.



The focus of attention for NASA has been on manned space flight. So far, three projects have been outlined. The first, Project Mercury, has already been completed. Its objective was to place a man in orbit and return him safely. Our ability to do this was demonstrated four times in 1962-63 by the successful flights of astronauts Glenn, Carpenter, Schirra, and Cooper.

Attention has now turned to Project Gemini, which is designed to further extend man's control over space. Gemini flights will be for durations of up to two weeks, during which time a pair of astronauts will develop orbital rendezvous techniques, as well as perform operations outside their space craft. Ten manned flights are planned, with the first one already completed by astronauts Grissom and Young.

By far the most complex of NASA's manned space programs is Project Apollo, which has an ultimate goal of landing Americans on the moon. An Apollo flight will place a command module containing three men into orbit about the moon. Once in lunar orbit, an excursion module will be detached and used by two of the astronauts to explore the moon's surface. They will then rejoin the command module and return to earth.

District Installations Play a Vital Role

In carrying out its missions, NASA has concentrated certain key functions at various centers throughout the country. Two of these space flight centers are located in District states and have provided considerable stimulus to the area's economy.

The **George C. Marshall Space Flight Center** was established at Redstone Arsenal near Huntsville, Alabama, on July 1, 1960, when a contingent of about 4,600 persons active in pioneer rocketry work were transferred from the Army Ballistic Missile Agency to NASA. The primary function of the Marshall Space Flight Center is to design, develop, and provide the basic launch vehicles used to overcome the earth's gravitational pull. This work is spread among many contractors located throughout the

country, but the ultimate responsibility for the necessary "boost" rests with the Marshall Center.

The Center itself occupies approximately 1,600 acres of land amid the sprawling, rustic expanse of Redstone Arsenal, and its facilities are currently valued at over \$250 million. Additional employees have augmented the original contingent to bring present civil service employment to slightly over 7,000, a level that is expected to hold through mid-1966. The buildup of NASA facilities in this area is shown by the construction spending figures of Table 1. Construction spending at Huntsville reached

Table I: NASA Construction Spending Fiscal Year 1961-66 (Thousands of Dollars)

	1961	1962	1963	1964	1965 (e)	1966 (e)
Huntsville	1,454	12,085	22,823	45,383	32,395	24,237
Michoud	—	1,259	10,033	19,291	17,867	4,700
Mississippi Test Area	—	734	11,637	45,866	114,938	58,030
Cape Kennedy	—	47,500	63,300	143,200	237,497	200,000

(e) Estimated. Source: National Aeronautics and Space Administration.

its peak in fiscal year 1964 and is slated to taper off in the future, according to NASA estimates.

In many instances, Marshall has found it advantageous to own certain installations and have the work there carried out by private contractors under NASA supervision. Thus, in addition to its administrative offices, Marshall also has facilities at Huntsville for the development, manufacture, and ground testing of launch vehicles that are manned by contract personnel. There were over 9,000 such direct contract workers in Huntsville in 1964. Table 2 shows the growth of total employment—that is,

Table II: Employment at NASA Facilities* Fiscal Years 1961-66

	1961	1962	1963	1964	1965 (e)	1966 (e)
Marshall Space Flight Center—						
Huntsville	7,429	7,125	14,507	16,316	**	**
Michoud Operation	—	1,403	6,958	10,283	10,070	9,734
Mississippi Test Operation	—	—	17	232	1,290	2,579
Kennedy Space Flight Center	1,436	2,959	4,216	7,283	12,073	13,892

*Includes both civil service and direct contract employment. **Estimates not currently available. (e) Estimated. Source: National Aeronautics and Space Administration.

both civil service and direct contract employment—at Huntsville and other NASA installations in the region.

Another NASA owned, privately operated installation is the Michoud (pronounced Miss'-you) plant in New Orleans. This plant began operations in 1961 and is used for the assembly of the giant Saturn boosters—the ones that will launch the lunar exploration capsules. These boosters will develop up to 7.5 million pounds of thrust, about the equivalent of one million cars, each with 160 horsepower.

The Michoud operation is housed in one of the country's largest manufacturing buildings—almost 43 acres under one roof. A nearby computer facility in Slidell, Louisiana, is a supporting part of the operation. The entire Michoud complex is presently staffed by over 10,000 workers em-

ployed by four private corporations under contract to NASA and about 300 NASA civil service employees. Because NASA took over an existing manufacturing building, construction spending at Michoud has been less than that at other locations, and relatively small expenditures are slated for fiscal year 1966. The facilities and equipment at Michoud were valued at over \$600 million at the end of 1964.

Another District space installation to be directly under Marshall's control is presently being constructed. This is the Mississippi Test Operation, where launch vehicles will be test fired on the ground before being sent to their final destination. The facility is located on the Pearl River in Hancock County, Mississippi, a site chosen because of its sparse population, proximity to Michoud, and its accessibility by water to and from other major installations, which permits the large rockets to be transported by barge.

When completed, the test stands and support facilities will occupy an area of about five square miles. This facility will represent about a \$256-million investment and should provide employment for approximately 2,500 contract workers, as well as a few civil service people. All of the construction work should be finished by 1967, and some testing is slated to begin early in 1966.

The **Kennedy Space Flight Center** near Cocoa Beach, Florida, is probably the most spectacular of NASA's operations and is the place where the work of the other centers culminates. Here the various components are assembled, checked and rechecked, and, finally, launched into space.

NASA so far has used launch facilities of the Department of Defense at Cape Kennedy. However, because of the size requirements for future projects, NASA is creating a new launch area of its own on nearby Merritt Island. Included among the facilities under construction is a vertical assembly building reputed to be the most spacious in the world. It is to be 52 stories high and will be one and one-half times larger than the Pentagon.

Construction spending at the Cape has been higher than at other facilities in the area, as can be seen from Table 1, and should continue to be high until the completion of the Merritt Island complex. The first unmanned launch from these facilities is tentatively scheduled for 1967. Total NASA employment at the Cape in fiscal year 1964 was 7,283, of which 2,359 were civil service employees and 4,924 were contract workers. Further employment growth is expected in the next two years, primarily in contract jobs.

Impact on the District

The construction and operation of these facilities have an obvious impact on the District, as is indicated by employment and construction expenditure figures. In fiscal year 1964, for instance, NASA employment at Huntsville accounted for about 2 percent of total nonfarm employment in Alabama, while the Michoud operation in New Orleans was directly responsible for over one percent of Louisiana's total nonfarm jobs. However, the impact by no means stops here. Although NASA maintains extensive facilities for carrying out its space objectives, more than 90 percent of its budget is spent with nonprofit organizations, such as universities and research institutes, and with private businesses.

District states received a sizable share of these prime contract awards, as can be seen in Table 3. In fiscal year

Table III: NASA Procurement Spending

Fiscal Years 1961-64
(Thousands of Dollars)

	1961	1962	1963	1964
Alabama	37,130	81,264	97,068	146,400
Florida	5,063	50,925	92,393	141,568
Georgia	2,921	3,352	6,025	6,416
Louisiana	79	18,534	185,263	286,257
Mississippi	—	93	86	609
Tennessee	949	2,163	2,301	2,490
District	46,142	156,331	383,136	583,740
U. S.	380,176	939,143	2,181,405	3,490,238

Source: National Aeronautics and Space Administration.

1961, the District accounted for 12 percent of NASA prime contracts; and, by fiscal year 1964, the region's share had increased to almost 17 percent. The majority of these awards in fiscal year 1961 were made in Alabama, as Marshall began to acquire launch vehicles. Contract awards in Alabama have increased in each successive year. As Project Mercury picked up speed in fiscal year 1962, the pace of awards in Florida also increased and has continued to accelerate. The opening of the Michoud plant accounts for the huge increase in awards in Louisiana beginning in fiscal year 1964.

The awarding of a prime contract to a firm within a given state does not necessarily mean that the money will actually be spent there, however. The initial firm may subcontract a part of the work, and the subcontractor, in turn, may seek other sources to supply a part of his needs. As a result, it is possible for a substantial part of the initial award to go to firms in other areas.

Some idea of the magnitude of subcontract shifting within the District is given by net first and second stage subcontracts originating with NASA's twelve largest prime contractors. This net is the difference between subcontracts placed in a state by firms located outside that state minus subcontracts let outside the state by firms located in the state. For instance, Table 4 shows that in fiscal year 1964 prime contractors in Alabama and Louisiana sublet more contracts outside the state than came into these states. However, the District states experienced a net increase in subcontracting because substantial inflows of sub-

Table IV: Space Subcontracts Flow out of and into District States*

Fiscal Year 1964
(Thousands of Dollars)

	Outgoing	Incoming	Net Gain or Loss**
Alabama	6,750	4,370	- 2,380
Florida	2,640	48,088	45,448
Georgia	153	530	377
Louisiana	45,244	13,336	-31,908
Mississippi	—	387	387
Tennessee	—	796	796
District	54,787	67,507	12,720

*First- and second-stage subcontracts of NASA's twelve largest prime contractors.

**(-) Indicates that contractors in a state sublet more contracts outside the state than came in from outside the state.

Source: National Aeronautics and Space Administration.

contracts to Florida and smaller inflows in the remaining states more than offset the outflows.

Secondary Effects

The impact does not even stop here, however. New industry brings new jobs, which create additional income, which stimulates spending, which, in turn, produces additional jobs, income, spending, and so on. In some instances, almost all the recent growth of an area can be traced directly to space-related activity. Such is the case with the Cape Kennedy area, where the total population in Brevard County, Florida, in 1940 was only 16,142. By 1963, the population had expanded to 150,800, most of it supported, directly or indirectly, by the space program efforts of either NASA or the Department of Defense. Moreover, the growth has not been restricted to Brevard County alone but has spread into the adjoining counties as well.

Much the same can be said for Madison County, Alabama, where the combined spending of the Marshall Space Flight Center and the Redstone Arsenal has been instrumental in changing the economic structure of the local economy. One substantial difference between the growth in the two areas should be noted, however. Growth in the Alabama area has been concentrated primarily around the core city of Huntsville and has transformed that once small city into the fastest growing metropolitan area in Alabama. On the other hand, growth in the Cape Kennedy area has not been concentrated around a single core but has been spread among a number of towns, and thus no large central city has developed.

In other instances it is more difficult to assess the impact of space spending on the local economy because a broad population, industrial, and trade base already existed. The effects of the Michoud plant on the New Orleans economy is a case in point. The direct effect in 1964 was an additional 10,300 workers with a payroll of over \$70 million. But what of the secondary effects? Using a U. S. Chamber of Commerce formula, the New Orleans Chamber of Commerce estimates that new jobs at Michoud brought an increase in employment in other industries of about 6,500 and an increase in retail sales of over \$33 million per year.

NASA has also made available a number of grants for pre-doctoral study of space science and technology at major universities within the District. In September of 1965, for instance, NASA will make grants of over \$5.7 million to support 323 scholarships at fourteen District universities.

Rapid growth is not an unmixed blessing, however. Additional services, such as fire and police protection, must be extended to the additional employees and their families; more funds must be allocated to take care of the traffic congestion caused by additional automobiles; and more classrooms and teachers must be provided for the additional school children. These and other problems, however, must be faced by all expanding communities. Most areas are happy to have the opportunity to cope with them.

N. D. O'BANNON

Louisiana Expands Role in Economic Performance

At the beginning of 1964, our review of economic conditions in Louisiana showed further expansion of major indicators from their 1960-61 recession levels. We wondered if the expansion would continue and, if so, whether increased construction and manufacturing activity would again spark the advance. These questions may be partially answered now; for, during the past year, Louisiana has "gone on with the show" or, in economic terms, the expansion has continued.

Center Stage

Personal income in Louisiana advanced 5.7 percent to \$6.4 billion in 1964, according to estimates made at this Bank. Although brisk, the increase was no greater than that for the nation. In fact, personal income in Louisiana has grown at about the same rate as its national counterpart since the beginning of the current economic expansion in February 1961.

Increases in personal income in 1964 were again sparked by advances in construction and manufacturing, along with a sizable boost from state and local government spending. In addition, higher income from rent, sales, services, and entrepreneurial ventures contributed substantially to personal income growth. Income from agriculture declined considerably, however.

Per capita income in Louisiana advanced \$70 to an average of \$1,846 in 1964, according to estimates of this Bank. This growth was somewhat less than that for the nation and, as a result, Louisiana's per capita income dropped further behind the national average, which increased to \$2,568 last year.

Total employment in Louisiana has moved upward. Nonagricultural employment increased nearly 4 percent over the twelve months ending in January to a seasonally adjusted level of about 851,000. This increase, somewhat more rapid than in other recent years, more than offset the continued decline in agricultural employment. Concurrently, insured unemployment in the Pelican State receded and, in the fourth quarter, dropped below 3 percent, the lowest seasonally adjusted rate since 1957.

Construction Takes the Lead

In 1963, the F. W. Dodge survey of construction contracts revealed an unprecedented \$280-million rise in contract awards in Louisiana. This increase brought the total for 1963 to a record level of \$939 million. The construction boom has continued, with contracts increasing further in 1964 to \$996 million. In the first two months of 1965, however, construction contract awards declined somewhat on a seasonally adjusted basis. Last year's increase in