

CHAPTER 3: Houston - Texas - U.S.A.

The Space Task Group began as a semiautonomous field unit, an essentially technical engineering organization highly dependent on the Langley Research Center and NASA Headquarters for administrative management and control. Like some great nova it had a seemingly spontaneous birth, conceived by a wholly external cosmic event—the orbiting of Sputnik I. As is often true with such stellar events, the developing American space program had a cloudy and possibly transient future. Yet the new NASA contained a considerable history of research and development in hypersonic flight and rocketry which became the intellectual and sustaining force behind the space program. Those who participated in the manned space program never exhibited any sense of uncertainty or confusion. A “can-do” attitude and determination carried the STG over many bumps, with the questions of how the program should be operated and where it should be located being among the more divisive.

Problems relating to the physical location of the STG and its management developed almost as soon as it came into being. On December 4, 1958, Paul Purser discussed merging people from the Lewis Research Center with STG people at Langley. G. Merritt Preston doubted that Lewis researchers would want to move to Langley, and Purser foresaw “similar problems in the other direction.” But everyone agreed that the important thing was to get the job done.¹

Abe Silverstein promoted the organization of the Goddard Space Flight Center, which came into being in May 1959, as a mechanism “to provide greater autonomy for the manned spaceflight operation, and in recognition that this new center might be a location where the manned space operations could develop to its appropriate stature.” Silverstein served as acting director of Goddard during its first few months of operation until Harry Goett, an engineering manager at Ames who headed a “Research Steering Committee for Manned Space Flight,” received the appointment. Robert Gilruth became “assistant director for manned satellites.” Because Project Mercury was in full swing and because there were no facilities available to receive personnel, no plans were made to physically transfer the STG. Gilruth, in fact, reported to his staff in February 1960 that “no major move of STG personnel is anticipated during the next two to two and one-half years.”²

It soon became clear to Silverstein, Glennan, and Dryden, however, “that the use of Goddard to house the manned spacecraft program was wrong” and that the existing management structure could jeopardize the program. Wesley Hjernevik, then Glennan’s personal assistant, recalls that the decision for an independent location for the STG came, in fact, largely from Glennan. Glennan, with counsel from Hugh Dryden, decided in late 1960 that the manned flight effort should be separated from Goddard, as it became evident that the idea of manned flight was becoming more popular and the perception of it being a stunt began to disappear. There were also more pressing concerns. The attachment of the STG to Goddard placed Gilruth lower in the management chain beneath the Goddard director, Harry Goett, instead of reporting directly to Headquarters. Because of this and other factors, the Gilruth-Goett-Silverstein linkage had become strained. In addition, having a major program

located at one center but managed by another created stress. Finally, Glennan and Dryden believed that a continuation and enlargement of the spaceflight program beyond Mercury would result in such massive expansion of the STG that its physical association would result in the Goddard scientific and research programs being overwhelmed. Separating the STG from Goddard would not only protect the integrity of scientific and research programs, but would also help resolve some of the management conflicts that had developed between Gilruth on the one hand and Silverstein and Goett on the other.³

Independently, George Low, whose “Manned Lunar Landing Task Group” was studying the possibilities for a manned lunar landing, had come to the realization that the manned spaceflight program should be separated from all other NASA centers and had been quietly urging this course. Silverstein completed a review of the Goddard-STG management problem in November and concurred that the STG should report directly to the Office of Space Flight Programs. On January 1, 1961 (before leaving office on January 20), Glennan issued an order separating the STG from Goddard and restoring it to its original semiautonomous status, and he also left a memorandum for his successor, not yet named, explaining why he had issued the order and recommending that the STG not be collocated at Langley Research Center, Marshall Space Flight Center, Lewis Research Center, or the High Speed Flight Station at Wallops Island. He left open the options of placing the program at Ames or at a new center, and Hjernevik believed that he preferred a new center. Glennan felt, however, that his successor should be the one to determine the location of the new center. But he did appoint a committee headed by Bruce T. Lundin at the Lewis Research Center to investigate the possibilities for relocating the manned flight program.⁴

Glennan indicated that the parameters for relocation should include a preference for a site close to an existing NASA installation, a site that would allow for the development of a life sciences center adjacent to it, that a move should not disrupt the Mercury program, and that contractors participate to a greater extent than they had under the Mercury program. Lundin, with Wesley Hjernevik, Ernest O. Pearson, Jr., and Addison M. Rothrock found a general consensus that the manned spaceflight program required a center of its own, but could get little agreement on where such a center should be located. The committee finally recommended that the STG be relocated at Ames Research Center in California.⁵

But as of April 12, when Yuri Gagarin made his spectacular Earth-orbital flight, a firm decision to create a separate center for the American manned space effort had not been made by the new NASA director, James Webb. Just as Sputnik I precipitated the organization of the STG, Gagarin’s flight seemed to mandate the separation and independence of the American manned spaceflight program. The Lundin Committee recommendations were forgotten. In late April, Abe Silverstein, Al Seipert (Associate Director for Administration), and Wesley Hjernevik (who had become Seipert’s Deputy Director for Administration) were called into Webb’s office to discuss a variety of questions, one of which had to do with projected costs and personnel numbers required for the creation of a new center. Numbers tossed out at that meeting would later become very critical in the formation of a manned spacecraft center. Abe Silverstein believed that 3000 personnel should staff a center, Hjernevik suggested that construction would cost in the realm of \$50 million, and Seipert decided that number should be bumped to \$60 million. The latter number soon appeared in the NASA appropriations bill. On May 1, Silverstein’s office completed a draft for “Organizational Concepts and Staffing

Requirements” of an “independent NASA field center responsible for the conduct of programs for manned spacecraft.”⁶

On another occasion in Silverstein’s office, Silverstein, Low, and Hjernevik reviewed the possibilities for relocating the manned spacecraft program, and it was at this meeting that Houston, Texas, first came up for consideration. Low recalls that Silverstein impulsively asked the question, “I wonder where Albert Thomas’ district is?” It was not a wholly innocent question. Thomas happened to be chairman of the House Appropriations Subcommittee which had responsibility for NASA appropriations. Moreover, years earlier, in October 1958 to be precise, Thomas had urged NASA Director T. Keith Glennan by letter and by telephone to consider Houston as a possible site for a NASA “laboratory.” Silverstein and others were aware of these inquiries. Wesley Hjernevik reminded Silverstein that Thomas’ district included Houston. They looked at an atlas and noticed that Houston was also the location of Ellington Air Force Base, which had become essentially deactivated since World War II. They also perused possible sites in Florida and California.⁷

Silverstein sent Philip Miller, Chief of the Facilities Engineering Division for Goddard, and John M. Parsons, Associate Director for the Ames Research Center, to Houston to look into location possibilities. Miller and Parsons were met at the airport in Houston on May 16 by George Brown, of the Houston-based Brown & Root construction company, who the previous month met with Johnson’s Space Council. With him was Ed Redding representing the Houston Chamber of Commerce. They first went to Rice University to visit with acting president Dr. Carey Croneis and then to Ellington Air Force Base to meet with the base commander Brigadier General Russell F. Gustke. “The General was very cooperative,” Miller recalled, “and had been briefed prior to our arrival by Congressman Thomas and indicated an alertness to the confidential nature of the visit.” From Ellington, the travelers drove south through open coastal prairie through a large tract of land identified as the West Estate which had recently been donated to Rice University by Humble Oil Company. George Brown indicated that Rice University would be favorably disposed to making the land available to the government for a research center installation. Parsons and Miller went through the 20,000 square foot West Mansion. They also found that barge traffic could navigate Clear Lake (with access to the Houston ship channel) to the property. They later viewed the inoperative Dixon Gun Plant and various industrial facilities in the Houston area and flew back with a report for Silverstein.⁸

Also in May a number of meetings were held which included at various times Bob Gilruth, Wesley Hjernevik, Abe Silverstein, Paul Purser, Paul Dembling (head of the Policy Planning Board) and occasionally James Webb, among others. These discussions resulted in a proposed plan for the organization, prerequisite physical facilities, general criteria for a location, and probable staffing needs of a new center. Another memorandum drafted by Dembling established specific criteria for locating a manned spacecraft center and was intended for circulation to Congress and prospective communities. Silverstein, Max Faget recalled, insisted that the projected center would operate directly under his authority at NASA Headquarters. When he failed to receive support on this issue, he elected to leave Headquarters and return to Lewis Research Center. Dr. Brainerd Holmes was appointed to head the newly created Office of Manned Space Flight, and the decision was made to first create the organization and then decide how much authority would be vested in Headquarters and how much in the center.⁹

Suddenly, Tomorrow Came . . .

The search for a location for the manned spaceflight laboratory now began in earnest amidst wild rumors and during a complete overhaul of the NASA Headquarters staff and organization. Since the summer of 1960, the national press had been generally critical of the progress, or “lack of progress,” in the Mercury program, so much so that in November, following two different launch failures, Glennan sent the following message to Gilruth:

. . . I know how discouraging these troubles are to you and your fine staff. Please try to close your ears to the press comments and know that there is no lack of faith in your ability to succeed in this effort. Now is the time for real driving leadership so grit your teeth and dig in. We are solidly behind you and your outfit.¹⁰

Gilruth and the STG had little time to consider moving anywhere, but concentrated instead on some very tough technical problems and test failures.

Finally, on December 19, a successful firing launched a test capsule to an altitude of 117 nautical miles; and on January 31, 1961, the chimpanzee Ham reached an altitude of 135 nautical miles and landed some 364 miles downrange. A successful test firing in February led to a marginally successful flight test on March 18. Then a bad launch forced a booster destruction order on April 25. A successful test using a Little Joe booster on April 28 preceded the May 5 launch of Mercury Astronaut Alan B. Shepard, Jr., using a Redstone missile on a ballistic flight path to an altitude of 116 miles and a downrange distance of 302 miles.¹¹ Shepard’s 15-minute suborbital flight was tremendously important, but its significance was sorely diminished by Gagarin’s 25,000-mile orbital flight aboard Vostok I, a capsule weighing five times as much as the Mercury “Freedom 7.” “Getting the job done!” became increasingly important to the STG as technical problems and external pressures mounted. The STG now began focusing on the launch of Mercury-Atlas 1 scheduled for July.

Congress began hearings on the \$1.7 billion NASA appropriations bill which included \$60 million for the manned spaceflight laboratory. A progress report released by the House Committee on Science and Astronautics on December 30, 1960, indicated some problems and malfunctions in the Mercury program, but explained that the “implementation of a project such as Mercury demands on a continuing basis, boundless energy, enthusiasm and determination. . . . Work on Project Mercury . . . is proceeding on a three shift, seven-day-a-week basis.”¹² Overall the report was wholly supportive, and anticipated, in a sense, a favorable response by Congress to the 1962 NASA appropriations bill, which included the allotment for a manned spaceflight laboratory. NASA began the search for a new center location in earnest.

Specific site criteria, made available to Congress and the general public, greatly facilitated the search. The site required access to water transportation by large barges, a moderate climate, availability of all-weather commercial jet service, a well established industrial complex with supporting technical facilities and labor, close proximity to a culturally attractive community in the vicinity of an institution of higher education, a strong electric utility and water supply, at least 1000 acres of land, and certain specified cost parameters. By June, Congressmen, such as Olin Teague, were being inundated with applicants for the spaceflight laboratory. Most simply could not qualify, as Teague explained to some of his Texas constituents, because only a large industrial area would meet the specifications. Houston was “probably the only Texas area being considered at the moment,” Teague said.¹³

Webb appointed a site selection team in August chaired by John F. Parsons and including Philip Miller, Wesley Hjernevik, and I. Edward Campagna, the construction engineer for the STG. Hjernevik became ill and was replaced by Martin A. Byrnes. First, a list of 22 cities which met the essential criteria of water and weather was established. This was reduced to nine areas, most of which included some federal facility. They were:

- Jacksonville, Florida (Green Cove Springs Naval Station)
- Tampa, Florida (MacDill Air Force Base)
- Baton Rouge, Louisiana
- Shreveport, Louisiana (Barksdale Air Force Base)
- Houston, Texas (San Jacinto Ordnance Depot)
- Victoria, Texas (FAA Airport)
- Corpus Christi, Texas (Naval Air Station)
- San Diego, California (Camp Elliott)
- San Francisco, California (Benicia Ordnance Depot)

Additional sites were soon identified, bringing the total to 23. Four of the added sites were in the vicinity of St. Louis, Missouri; two additional sites were identified in Houston (including one offered by Rice University and another by the University of Houston). And other sites were variously in Bogalusa, Louisiana; Liberty, Beaumont, and Harlingen, Texas; and Berkeley, Richmond, and Moffett Field, California.¹⁴

Between August 21 and September 7, the team visited 23 cities, beginning in Jacksonville, Florida, and ending in Palo Alto, California. The routine at each stop involved an afternoon arrival and a greeting by State and local dignitaries, a trip to the hotel where the visitation team explained the selection criteria, a breakfast meeting with townspeople, a visit to the proposed site and the nearby college or university, and a late afternoon departure for the next city on the agenda.¹⁵

During the visitation, particularly strong political pressure developed from a Massachusetts delegation headed by Governor Volpe and Senator Margaret Chase Smith, which produced a personal inquiry to Webb from President Kennedy. Missouri directed its case through Senator Stuart Symington. California's Congressman George Miller, then acting head of the House Committee on Science and Astronautics, championed the case for his State. Proponents of sites in Boston, Massachusetts, Rhode Island, and Norfolk, Virginia, made separate presentations to Webb and the Headquarters staff, and these additional sites were added to the final review. By the close of the visitation period, the site selection team had identified MacDill Air Force Base at Tampa, Florida, as the preferred site, largely because the Air Force planned to close down its Strategic Air Command operations at that base. A Houston site offered by Rice University was second, and the Benicia Ordnance Depot in the San Francisco Bay Area was third. Before a decision could be made, however, the Air Force decided not to close MacDill, omitting it from consideration.¹⁶

Houston moved into first place. Webb, now in close contact with President Kennedy on the matter, informed the President on September 14 of the decision made by him and Hugh Dryden. On that date Webb replied in two separate memoranda to President Kennedy's inquiry reviewing for him criteria and procedures for the site selection. One memorandum reviewed procedures, and the other reported that: "Our decision is that this

Suddenly, Tomorrow Came . . .



Texas cattle grazed the 1000-acre land parcel outside Houston at the time its selection as site of the Manned Spacecraft Center was announced. Soon they were herded out to make room for spacecraft, astronauts, and engineers.

laboratory should be located in Houston, Texas, in close association with Rice University and the other educational institutions there and in that region.”¹⁷ After advance notifications of the award were made by the Executive Office and from NASA, the public announcement of the location followed on September 19, 1961.

NASA announced that the \$60 million manned spaceflight laboratory would be located “in Houston, Texas, on a thousand acres of land to be made available to the government by Rice University. The land, in Harris County, borders on Clear Lake and on the Houston Light and Power Company salt water canal.” The laboratory would be “the command center for the manned lunar landing mission and all follow-on manned spaceflight missions.” Under the 1962 budget, appropriations for construction included \$12.1 million for a Flight Project Facility, \$13.2 million for an Equipment Evaluation Laboratory and Support Facility, \$3.6 million for a Flight Operations Facility, \$26.5 million for an Environmental Testing Laboratory, and \$4.5 million for site development and utilities. Webb emphasized that the Houston location would provide an integrated facilities system interconnected by deep water transportation with the expanded lunar launch facilities at Cape Canaveral and the Michoud Plant on the Mississippi River near New Orleans, where the space vehicles were to be fabricated.¹⁸ The acquisition of these facilities in the summer of 1961 completed the assemblage of NASA centers.

The reaction to the Houston location among STG people, including Gilruth, was less than enthusiastic. Gilruth and many others were reluctant to leave the Virginia area which had

been home for many years. Texas was not known to be a particularly hospitable place. Not only was he not enamored with the selection of Houston, but his first visit to Houston, did not help his perception of things. Hurricane Carla arrived in the Houston area just before Gilruth.¹⁹

Martin Byrnes, Gilruth, Walter Williams (the new Associate Director of the Manned Spacecraft Center), John Powers, and Ralph E. Ulmer (a facilities specialist at NASA Headquarters) arrived in Houston on September 22, 1961, as the first official NASA delegation. As the delegation made its way to a motel, “the night was humid,” Byrnes recalled, “air . . . heavy with the odor of the Houston channel, [and] industries blowing downwind from petroleum and chemical facilities and the paper mill in that general area” generated some very grim comments. The next day Ed Campagna joined them and they toured the countryside in the vicinity of the new center.²⁰

The scene was one of devastation. Telephone lines and debris littered the roadway. Along Farm Road 146 and 528 leading to what would soon be the main entrance to the Manned Spacecraft Center, boats had been hurled into the highway, pieces of houses and buildings lay in the fields, trees were flattened, and fields and pastures were still flooded or sodden with the heavy rains from Carla. Ellington Field, which would provide temporary quarters for the STG, offered dreary wartime housing with peeling paint and a sense of high disrepair. It was altogether uninviting. Early Sunday morning everyone except Byrnes, Powers and Ed Campagna returned to Washington or Langley.²¹ Meanwhile the local newspapers and national media carried the story of the selection of Houston as the home for the spaceflight laboratory and the phone never quit ringing.

The local press attributed the selection variously to Rice University, Congressmen Albert Thomas and Bob Casey, President Kennedy, Vice President Johnson, NASA Administrators James Webb and Hugh Dryden, Rice University’s new President Kenneth Pitzer and Chancellor Carey Croneis, Rice University’s Board Chairman George R. Brown, Humble’s Board Chairman Morgan Davis, and the general “can-do” attitude of the Houston community. Although the latter may have been as important as the diligent efforts of Congressman Albert Thomas, the Houston site, as Thomas carefully reiterated, met the requirements of the Moon shot program better than any other.²²

Although the Houston site neatly fit the criteria required for the new center, Texas undoubtedly exerted an enormous political influence on such a decision.



Congressman Olin E. “Tiger” Teague, member of the House Committee on Science and Astronautics and head of the Subcommittee on Manned Space Flight, is shown here during a tour of Manned Spacecraft Center testing facilities. Congressman Teague was one of the architects of the American space program and an early partisan for the location of a NASA center in Texas.

Lyndon B. Johnson was Vice President and head of the Space Council, Albert Thomas headed the House Appropriations Committee, Bob Casey and Olin E. Teague were members of the House Committee on Science and Astronautics, and Teague headed the Subcommittee on Manned Space Flight. Finally, Sam Rayburn was Speaker of the House of Representatives. In the long run, the resources of Texas and the general enthusiasm of the Houston people combined to win not only the location of the Manned Spacecraft Center but also the hearts of the people who would soon be migrating to this strange new land.

Local enthusiasm and support began to be felt immediately and had a large role in making the new Manned Spacecraft Center really happen. The “can-do” attitude, infused by the excitement and drama of manned spaceflight, suddenly infected the Houston community and in turn rejuvenated a somewhat despondent STG and their families. Wesley Hjernevik immediately sent a small group to join Martin Byrnes (Site Manager) in Houston to begin making arrangements for the move. Among these were Stuart Clark (head of personnel), Burney Goodwin, Eugene Horton, W.A. Parker (Site Procurement Chief), John Vincent, Jeff Davis, Luther Turner, and Robert Peck. We arrived as “heroes,” Parker recalled, although we were strictly lower to middle management. “The keys to the city were just all but given us,” he said. The group met with representatives of the Chamber of Commerce, Small Business Administration, Better Business Bureau, and civic and social organizations. “The city was ours,” Parker recalled. “We had police escort from meeting to meeting because everyone was interested in talking with us. . . . We had a constant audience.” He and Marty Byrnes woke up at their motel one morning, he said, to find a letter from the president of Joske’s Department Store and a new Stetson hat for each. After a meeting with the Bay Area realtors, the realtors devised a system for meeting every newly arrived STG employee at the airport, and provided each with a tour of the city and housing possibilities. The banks were outstanding. If a NASA employee arrived short of cash, the banks would open for them and provide funds any hour of the day or night. And the Chamber of Commerce produced tickets to the football games, theater, parties, or anything anyone desired. “We were on stage, we were the NASA people, and it was a glorious experience while it lasted.”²³ Byrnes, heading the Houston advance party, coordinated the “promotional” aspects of the move with John A. “Shorty” Powers at Langley.

Powers, who made the initial visit with Gilruth in September, had been tremendously impressed with the friendliness and support of the Houston people. According to George Low, it was Powers who lessened the apprehension felt by task group personnel at Langley upon news of the forthcoming move to Houston. He put out an announcement that “Houston was a great place to live,” and his theme that we should all go to Houston “and build a new center there” began to change the mood of gloom to one approaching enthusiasm.²⁴ Houston, albeit with some effort, could be envisioned as the promised land for the STG.

Powers launched a campaign at Langley, in cooperation with the Houston Chamber of Commerce, to make the move not only palatable but attractive. He posted signs all over Langley saying that “Houston is a good place to live!” His office presented slide shows and provided brochures. Ben Gillespie came from Houston to show a movie on the City of Houston and the new site. Powers held open meetings in the Langley cafeteria, and “shot down” the rumors that Houston had a hurricane every year and that hundreds of snakes crawled around the streets. His vigorous campaign closed with special flights being made available to some husbands and wives to fly to Houston and see the city firsthand.²⁵ It was

an admirable and effective promotional campaign. To be sure, many came to Houston resigned to the fact that such a move “went with the job.” For some families, the move to Texas was a long and difficult transition. Happily, Houstonians really wanted and welcomed the new NASA center and all of the people with it.

No single person so reflected the sincere warmth, support, and helpfulness of the Houston community as did Mrs. Grace Winn, who seems to have personally touched the lives of most of the STG moving to Houston. By sheer coincidence Grace Winn happened to be spending an extended visit in Washington, D.C. (recovering from a whiplash suffered in an automobile accident), and dropped by to see her old friend Olin E. “Tiger” Teague at the Congressman’s office. Teague “was sitting in his office with his coat off in front of his television listening very intensely.” “When he saw me,” Grace Winn said, “he motioned me to come in, sit down, and listen to the program he was watching.” Winn sat down without having the slightest idea what she was hearing, and in a few moments Teague excitedly explained to her that NASA was going to Houston. Grace recalled that she had no idea what NASA was, but that “Tiger” Teague said that since she knew the city and had been a part of it for a long time, she should go and introduce these people to Houston. He then picked up the phone and called Franklin Phillips, assistant to Administrator James Webb, and told him that NASA should send her down there. Phillips asked her to come see him.²⁶

The next morning after their conversation, Phillips called Stuart Clarke, Chief of Personnel for the STG at Langley. Clarke asked Grace to come down to Langley the next morning and made reservations for her on a 7:00 a.m. flight. At Langley, Grace visited with Clarke and “Shorty” Powers, who asked her to join the STG in the Public Affairs Office. Grace accepted and on Monday, November 13, reported for work—the thirteenth person with the STG, she recalled, to report for permanent duty in Houston.²⁷

Grace went to her office in the Gulfgate Shopping Center, picked up an already massive pile of mail, and was told that she would be moving her office to the Rich Building. Her job was to head the relocation office and facilitate the move of Langley people to Houston. Her approach, she decided, would be to treat people the way she would want to be treated if she were going through a similar move. So she decided the best thing to do would be to meet the new people at the airplane as they arrived. Her first group was to arrive at Houston International Airport (now Hobby Airport), quite some distance from the temporary offices south of Houston. She spent a rainy afternoon waiting for a plane which never came, but which was deflected to Little Rock, Arkansas, because of bad weather. When it did arrive the next day, everyone aboard was “tired, worn out, disgusted and discouraged.” Grace took them all to her country club to lift their spirits and gave them a warm, personal welcome. Then she contacted realtors and suggested to them that because of the limited amount of time the families would be in Houston, they all should cooperate and show not only the homes they had listed, but also those listed by their competitors. And they did—thereafter!²⁸ And Grace Winn thereafter personally met most of the newly arriving NASA families at the airport. In a short time she became legend.

She talked to newcomers about schools, homes, children, taxes, and even whether they should leave their comfortable homes and lives in Hampton or Newport News, Virginia, and come to Houston at all. After talking to Grace, many came willingly. She kept cards to send to members of families who were ill, and sometimes took them food or flowers. She knew,

she said, how lonely it is to be sick in a strange town. Max Faget said that Grace Winn wanted everyone to buy a home near her in Memorial Forest, a place, Faget said, that unfortunately was beyond the reach of most of their pocketbooks, and quite distant from the Manned Spacecraft Center.²⁹

Grace, officially described in a Manned Spacecraft Center announcement as a “gracious and talented lady,” arranged to have manuals for Texas driving tests on hand for the newcomers, rental cars provided at flat minimum rates, brochures about houses and apartments, information from the Better Business Bureau about buying automobiles and property, information on home and deed insurance, and lists of doctors, dentists, veterinarians, baby-sitters, and dealers who sold boats and fishing equipment. She provided maps, books and charts about weather. She also stocked books about local insects and snakes for the wary new arrivals. “We tried,” she said, “to think of everything possible.” The Retail Credit Association facilitated the hookup of telephones and utilities and opening charge accounts. In 1962 Joan Pesek and Linda Sauter provided her “gracious and patient” assistance in the relocation office. Despite the personal touch and the genuine sense of welcome, moving to Houston was a difficult business. There were few places to rent at a reasonable price anywhere, and few suitable homes for sale in the area. What would become the NASA community was amidst a then desolate and remote farming and fishing area south of Houston.³⁰

Grace remembered the excitement when, after a press conference, astronauts Ed White, Jim McDivitt, and Frank Borman decided to stay and look for a home before they returned to Langley. Grace helped them in their search and, at the end, as Ed White negotiated for his house, neighborhood children came up to Grace who had stepped out front and asked her if those men were astronauts. Grace told them “yes,” and the kids ran up and down the street yelling “astronauts are in the house!” When White and McDivitt came out, the children asked for their autographs. After obliging, both expressed surprise to Grace that anyone would want their autograph, because they hadn’t done anything. She told them that this was Houston’s first experience of this type and they would soon know what it really meant to be asked for autographs. Wesley Hjernevik believed that what “really made the difference was the welcome that was given us by everyone NASA people bumped into whether the guy at the gas station, the grocer, or their new neighbors.”³¹

The first edition of the *Space News Roundup*, published on November 1, 1961, announced that the old STG had ceased to exist and in its place stood the new Manned Spacecraft Center. Moreover, this center had a new home, in Houston, Texas, where “the people . . . have literally welcomed MSC personnel with open arms.”³² And it was true that Houston had an affair going for the NASA contingent—at least for awhile. After a year or so some of the novelty and maybe even the affection began to wear a bit, but then Houston was so busy growing one could not spend too much time concentrating on any one aspect of that growth. Public demonstrations of support declined after awhile, but Houston’s adoption of the MSC personnel and families was every bit genuine.

Although people such as Mrs. Winn helped alleviate the trauma of a distant move, efforts to continue scheduled operations while setting up business in a new city, all the while building a new \$60 million center and making massive additions to personnel and programs in a distant place, placed heavy burdens on all personnel and their families. It required a superhuman effort and enormous cooperation from many sectors of public and private life.

Help came from unexpected places. A few days after Hjernevik's advance party arrived, Wes Hjernevik called to ask them to set up offices in Houston, which had not been a part of their assignment. He called Wednesday evening and wanted spaces ready that Friday. By chance, when the call came in, Marvin Kaplan, the manager of the Gulfgate Shopping Center, was with the group. He said he had two empty dress shops that they might use. The six people on hand promptly walked across the street to the shopping center and decided that indeed the Gulfgate Shopping Center would be fine for temporary quarters. Fingers Furniture Company in Houston offered furniture free of charge; Southwestern Bell installed telephones promptly without a purchase order; Joske's Department Store provided the drapes without charge; a leasing car company provided complimentary automobiles until government vehicles became available; and Continental Airlines offered their hostesses to serve as receptionists until regular government staff could be hired. On Friday the General Services Administration (GSA) delivered a load of office furniture from Dallas at the same time a load of furniture arrived from Fingers. Fingers Furniture stored the GSA equipment for later use.³³ By Friday afternoon, the new MSC administrative office was ready for use, but the NASA "outfitters" soon realized that such charitable goodwill could create legal and ethical entanglements and took precautions to legally document all aids, assistances, and purchases. No problems ever resulted from Houston's generosity.

The six-man advance party received their permanent assignment to MSC about 4 weeks after their arrival and thus became the first full-time NASA employees. They spent most of their time providing orientation and "education" for the local citizens. Local businessmen needed to know how to do business with the government. They had difficulty understanding why they could not take their prospective government customers to a ball game, give them gifts, or take them on hunting expeditions. Chambers of Commerce were alerted to the hazards of a "boomtown" development. School boards were informed of the prospective enrollment growths and interest in quality programs.³⁴ Slowly at first, but at a rising rate, a nascent NASA community began to take form on the southern reaches of greater metropolitan Houston.

In the early days, life tended to be haphazard both at the Langley Center, where new STG personnel were gathering, and in the community adjacent to the new Houston center. Many STG personnel arrived at Langley expecting to be permanently stationed there. Others hired on as STG employees knowing there would be a move, but not knowing where. The transition was difficult on employees and their families. Housing and office space were scarce at Langley and in Texas. Wesley Hjernevik, who arrived at Langley in October 1959, managed to rent a large home for his family who would join him later. He became Grace Winn's counterpart at Langley—but in an official capacity. He managed most of the new hire and transfer operations for the STG. In fact, some new employees such as Bill Parker, Ed Campagna, Floyd Brandon, Stu Clark, and a few others "batched" at Hjernevik's home until "Mrs. Hjernevik finally arrived and booted us out." Clark and Parker then rented three houses on Lighthouse Road on Chesapeake Bay, provided maid service, linens, and utilities, and charged \$35 a month to single employees or spouses who needed temporary quarters pending the arrival of their families. At times as many as 25 employees lived in the three homes. Some "dissidents" broke away from the Chesapeake fraternity and began their own enclave elsewhere. In 1962, the Hjernevik's and many of the STG employees made their permanent

move to Houston, but the new center was not ready for final occupancy until 1964.³⁵ Getting temporary office quarters for center operations was about as hectic as acquiring living space.

The Houston Chamber of Commerce provided Martin Byrnes a temporary office in its suite, and Chamber members and employees, including Pat Patillo, Ben Gillespie, Marvin Hurley, and Gordon Turrentine helped assemble lists of spaces that might be leased as temporary quarters. With the help of the GSA field office manager in Houston, Byrnes reviewed the possibilities and visited selected buildings. He brought his recommendations with photographs, floor plans, and descriptions back to Langley where he, Gilruth, Walter Williams, and staff people in various facilities decided to seek four specific buildings located in the vicinity of the Gulf Freeway and the Old Spanish Trail in south Houston. Upon his return to Houston, Byrnes and the Houston GSA office manager went to see the GSA Regional Commissioner in Dallas.³⁶

The GSA staff wanted specifications rather than specific buildings, and indicated that staffers could not go to Houston to begin the work for at least 2 weeks, property assessments would take another month, the contract would take 90 days to prepare, and possibly in 6 months the buildings could be under contract. Byrnes responded that he needed them in 10 days, and if it required more time, then NASA would take care of the leasing itself. About this time the commissioner came into the room and said that instructions from the Washington office were to meet the schedules established by NASA. In approximately 3 weeks the Rich Fan Company building, the Houston Petroleum Center, the Farnsworth-Chambers building, and (somewhat later) the Lane-Wells building were under government lease. Dr. Stan White's Life Sciences Division moved to the Lane-Wells building, Max Faget's Space Flight Office took the Rich Building on Telephone Road, while headquarters occupied the Farnsworth-Chambers building, and the Houston Petroleum Center absorbed other offices (figure 1).³⁷

Other buildings leased included one formerly used by the University of Houston as a television-radio station, which MSC converted to a computer facility. A former Canada Dry Bottling building became a machine shop; the unused Minneapolis-Honeywell building housed the photographic labs of the Public Affairs Office; apartments were leased; a former bank building became the personnel office; and later a vacated Veterans Administration building in downtown Houston became available.³⁸ But a large number of MSC personnel found office space at Ellington Field.

Ellington Field, established as a World War I training base was reactivated during World War II. By 1961 the facility had been inactivated to serve primarily as a reserve training facility. The buildings available to NASA were mostly World War II Wherry-type barrack structures with wooden walls and no air-conditioning. The light construction and wooden raised flooring made them unsuitable for labs or shops, but with some renovation (at \$6 to \$7 per square foot) adequate for office space. Before construction was completed on the MSC site, some 1500 personnel worked at Ellington Air Force Base.³⁹

Preliminary steps leading to the construction of the new center in Houston actually began before the acquisition of temporary facilities. Arrangements had been made at the Washington level for construction of the new center to be managed by the Corps of Engineers. On Monday, September 24, Ed Campagna, James M. Bayne and Marty Byrnes flew to Dallas to meet with Colonel Paul West, the District Engineer for the Fort Worth

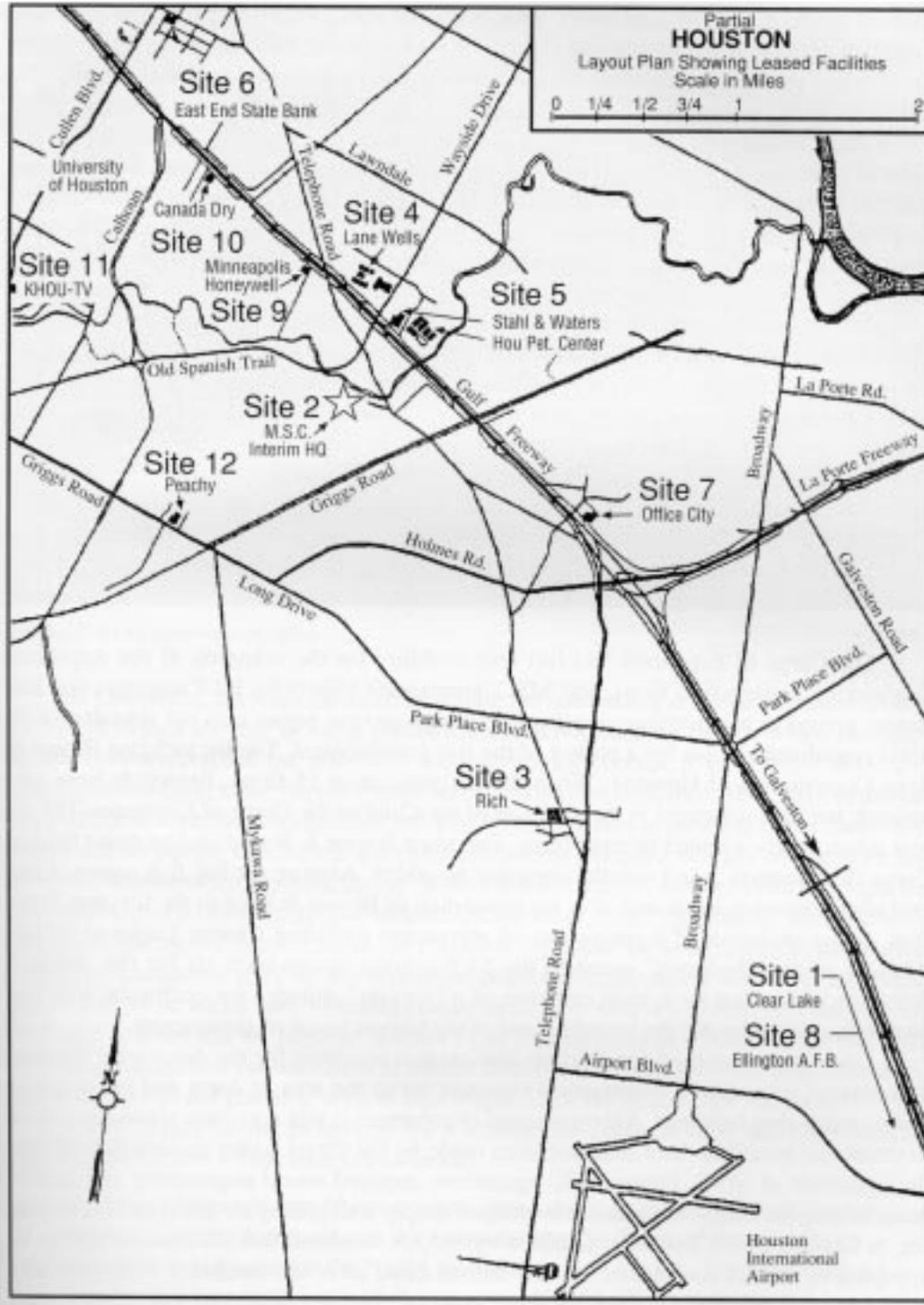


FIGURE 1. Interim Facilities Leased as of August 1, 1962

District of the Corps of Engineers who, with his staff, would supervise design and construction of facilities. Byrnes and Campagna explained that they required a center which would house possibly 5000 people, cost less than \$60 million, be designed within 6 months, and be built within 18 months. The reaction from the Corps staff was that it simply could not be done, and that the design time and construction time were wholly unrealistic. "In the midst of a pretty uncontrolled meeting," Byrnes said, Colonel West came into the room and said that he had just talked to the Chief of Engineers in Washington and had been told that the NASA schedule as it had been described "is the way things were going to be."⁴⁰ Again the "can-do" attitude, which presumably emanated from the highest levels of the government, prevailed against the impossible.

During 1961 the federal government acquired title to the 1000-acre donation from Rice University and purchased an additional 600 acres needed to give the site frontage on the highway. A 20-acre reserve drilling site fell within NASA's total 1620-acre site. The State legislature authorized and funded the construction of NASA Road 1, a unique and distinctive highway category, for which there was no precedent and has been no sequel. The Corps of Engineers opened a project office in Houston. Design work was underway in January 1962, and construction on the underground utility systems and roadways began in March. Gilruth transferred his headquarters to Houston effective March 1; thus, on that date the Manned Spacecraft Center in Houston, Texas, became a fully operational NASA center, although Project Mercury offices, under the authority of Walter C. Williams, remained at Langley.⁴¹

The Corps of Engineers had full responsibility for the selection of the Architect/Engineering construction firms, and MSC, represented largely by Ed Campagna and Jim Bayne, served in a consulting capacity. The design process began with the selection of 20 firms considered eligible for a project of the size contemplated. The list included Brown & Root Construction of Houston. When the list was cut to 15 firms, Brown & Root was omitted, but then reinstated at the direction of the Chief of the Corps of Engineers. The list was subsequently whittled to eight firms, and when Brown & Root failed to make the list, Corps Headquarters asked that the company be added. Another cut left five names, again excluding Brown & Root, and after the reinsertion of Brown & Root to the list, that Texas firm, acting on behalf of a consortium of contractors including Charles Luckman of Los Angeles as the "designer," received the \$1.5 million design contract for the center.⁴² Although it may not have been evidence of a "can-do" attitude, the contractor selection process possibly also felt the invisible hand of the highest levels of government.

Corps supervision of construction also created problems for the developing Manned Spacecraft Center. Corps construction expertise lay in the area of dams and major public works, rather than buildings. Although speed of construction was necessary, speed contributed to errors and oversight. Unilateral decisions made by the Corps during construction affected the operation of MSC. Future MSC operations required sound engineering and quality controls, and the Corps, of course, was charged simply with getting the job done and moving on. A Change Order Board, established by NASA, required that all changes had to be approved by NASA consultants, but this did not close all of the loopholes.⁴³ Despite difficulties and delays, the new center developed largely according to schedule, and included some real construction and developmental achievements and only a few failures.



Building 1, the Administration Building.

Ed Campagna, for example, listed as among the outstanding construction achievements the overall design concept of using prefabricated exterior building panels, which has since become common practice, but at the time was a pioneering concept. It was a major element in bringing construction to the required speed and keeping costs contained. The center employed a cost-efficient continuous-loop utility services system. A data acquisition center monitored heating and air pumps, fans, valves and electrical systems providing efficient maintenance and operation. Interior office modules, also at the time a novel feature, lowered costs and made for more efficient utilization of interior spaces. On the other hand, the original administrative building design proved nonfunctional, far exceeded costs, and had to be redrafted; the original design and specifications for the environmental chambers totally failed; and utility relays and stations had to be added later to accommodate expansion. Overall, Gilruth and most of the MSC staff believed that the physical facilities filled the requirements of the program and were built with taxpayer cost consciousness in mind. Gilruth attributed much of the efficiency of the plant to the design and planning work of Max Faget, Aleck Bond, and Dick Johnston.⁴⁴

A joint report on the project by the Facilities Division of MSC and the Corps of Engineers for the Fort Worth District concluded:

Based on economical cost of construction, speed and ease of erection, and general appearance, the architectural concept established by the design of the facilities . . . is considered well suited to the NASA mission and NASA needs. It is functional; it has the clean lines associated with the space age look; it reflects space science in an architectural manner without being ostentatious.⁴⁵

Numerous state and national contractors and suppliers participated in the construction process. Contracts for the first 11 buildings were awarded in December 1962, and within 12 months, by January 1964, 2100 employees were readying for the move to the site with the remaining 600 personnel to be on site by July.⁴⁶

Building a new center, of course, meant much more than building buildings. As Paul Purser carefully explained in an institutional planning study, “Centers are people and competence, not numbers of personnel and facilities,”⁴⁷ and it is with that admonition in mind that one must review the lists of buildings built and people hired. And to be sure, there were a lot of both. Between July 1961 and July 1962 the number of MSC employees more than doubled from about 750 to almost 1600 and would almost double again within the year.

That July 4 (1962), Houston celebrated MSC with a truly Texas-style, Texas-sized barbecue. A parade featured in a 60-car motorcade Vice President Lyndon Johnson and Governor Price Daniel of Texas, Senators Ralph Yarborough and John Tower of Texas, Senator Robert S. Kerr of Oklahoma, Congressman George Miller of California (who chaired the House Committee on Science and Astronautics) and Texas Congressmen Olin

*TABLE 1. Johnson Space Center Buildings —
Construction Costs and Size*

| Building | Contract Amount | Sq. Ft. | Cost/Sq. Ft. |
|-----------------------------------|-----------------|---------|--------------|
| 1 Auditorium/Public Affairs | \$1,099,749 | 51,840 | \$21.21 |
| 2 Office Building | 4,420,487 | 209,610 | 21.09 |
| 3 Cafeteria | 463,180 | 22,330 | 20.74* |
| 4 Flight Crew Operations Office | 1,944,573 | 111,911 | 17.38 |
| 7 Flight Crew Operations Lab | 825,337 | 39,621 | 20.83 |
| 8 Technical Services Office | 918,204 | 58,023 | 15.82 |
| 10 Technical Services Shop | 1,655,906 | 77,381 | 21.40 |
| 12 Central Data | 907,366 | 65,930 | 13.76 |
| 13 Systems Evaluation Lab | 1,320,670 | 72,579 | 18.20 |
| 15 Instrument and Electronics Lab | 1,344,632 | 74,277 | 18.10 |
| 16 Spacecraft Technical Lab | 1,507,612 | 97,228 | 15.50 |
| 417 Garage | 156,052 | 6,874 | 22.70 |
| 419 Support Office | 259,285 | 19,170 | 13.53 |
| 420 Support Shops and Warehouse | 554,962 | 44,127 | 12.58 |
| 221 Substation Control | 13,244 | 682 | 19.42 |
| 322 Water Treatment | 12,666 | 511 | 24.78 |
| 223 Sewage Treatment | 22,122 | 326 | 67.86 |
| 24 Central Heating and Cooling | 340,091 | 25,006 | 13.60** |
| 25 Fire Station | 143,349 | 7,220 | 19.85 |

* Excluding kitchen equipment.

** Excluding equipment; building shell only.

Note: Buildings 1 and 2 were later renumbered at the instigation of Deputy Director Sigurd A. Sjøberg who wondered why the main administration offices were not “Building 1.”



A 1974 aerial view of JSC denotes the marked changes in the countryside south of Houston, Texas, since the inception of NASA's manned spacecraft program.

Teague, Bob Casey, Albert Thomas, and Clarke W. Thompson; the seven Mercury astronauts; NASA Administrator James E. Webb, Dr. Brainerd Holmes (director of the Office of Manned Space Flight), MSC Director Robert R. Gilruth, and Associate Director Walter C. Williams; and others. It began and ended at the Sam Houston Coliseum. An elaborate barbecue of beef, chicken, pork, potato salad, beans, and all the trimmings followed at the Coliseum for *all* employees of the MSC and their families and guests. It was a rather astounding and heartfelt welcome from the City of Houston and the State of Texas.⁴⁸

Soon after, another Houston welcome was extended to President John F. Kennedy who was making a whirlwind tour of the Nation's space facilities. Twenty-five thousand Houstonians met him at the airport on Tuesday, September 11. The following day almost 200,000 people lined the parade route to cheer the President, Vice President Johnson, Congressman Albert Thomas, James Webb, the astronauts, and MSC officials. Kennedy addressed a full house in Rice Stadium. "The exploration of space," he said, "will go ahead, whether we join it or not . . . no nation which expects to be a leader of other nations can expect to stay behind in this race for space." The Manned Spacecraft Center is evidence, he said, of "how far and how fast we have come, and how far and how fast we must go." Houston, Kennedy said, which was once the "furthest outpost in the old frontier of the West will be the furthest outpost on the new frontier of science and space."⁴⁹