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Oral history interview with Eugene H. Brock
[full name of interviewee]

about MSC
Computer facilities and data
[main focus of interview]

Analysis.

Title: ~~or Data~~ 1962- Data Computation Division, MSC
[interviewee's current and/or former title and affiliation]

1968- Chief, Computation & Analysis Div, MSC

Interview conducted by Robert B. Merrifield, Staff
[interviewer's name/position]

Historian at MSC
[location of interview]

Transcript and tape(s). [for inventory only: # pages 8; # tapes 1]

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CONTENTS:

Biographical - [date/place of birth; family background] _____

Education - _____

Career Path - GE, Manager Computer operations Contract
w/ Army at Redstone Missile Site/Range? in
1962 to MSC as Consultant, then Mgr of
Computation Center

MSC Computation Center
Topics - Initial Staff of 20, rented computer time from
Ceir Plant; IBM 7094 Setup in old radio Sta 4H;
1963 Lockheed Contract for automatic data reduction syst;
manpower support by contract w/ Wolf Research &
Dev; ~~division growth~~ ^{division growth} ~~reorganizations~~ ^{personal growth} ~~division~~ ^{facility shortage};
multiple Computer locations; 1966-67
~~acquisition of~~ ^{addition} new Univac computers; 1968 MSC
Appointed official librarian for NASA;
extra curricular activities & Division personnel
industry, university, seminars, conferences.

mgr, GE Info Processing Center

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Interview with Eugene Brock
3/18/68

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Prior to coming with NASA, I was with the GE Company as manager of the computer operations contract the company had with the Army at Redstone. I came to MSC initially as consultant in March 1962. This particular consulting trip to Houston was a result of a meeting at Langley with Mr. Clarke, Mr. Hjernevik, and others relative to taking the job as manager of the Computation Center here in Houston. I came onboard in April 4, 1962, directly from Phoenix, Arizona. I had been transferred there just a very short time before from Huntsville, Alabama to manage the Information Processing Center at GE's main computer plant. When I came on board I had a room in the Farnsworth-Chambers Building. We also had offices at the Ceir Plant in downtown Houston, but our main office was in the Farnsworth Chambers Building. Our total complement of people was in the neighborhood of 20. The computation work that we were doing at the time was very minor, since there were very few people at the MSC, their needs were small, and we were renting computer time from the Ceir organization. At a later date (when?) we obtained a computer, an IBM 7094, from Langley and had it transferred to Houston. Through agreement with the University of Houston, we set it up in the old radio station on the campus. We still had a very small working group and very small computer usage at that particular time.

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This organization was known as the Computation and Data Reduction Division and was located in Hjernevik's Administrative Directorate.

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We put out a study in the middle of 1962, explaining the functions of the Computation and Data Reduction Division and made a projection of what we felt would be Center requirements for different types of data processing. This document was sent to all the directorates, and they were requested to comment on it, and indicate what additional requirements in the use of the Center's computers they could envision. We received good evaluation from various directorates and proceeded to implement the projections as described in the document. One of the first things that we did since we knew the Data Reduction was going to be a major factor in our work, was to complete the specifications for a near automatic system for data reduction. A request for proposals was approved after 5 months of Center and Headquarters evaluation. The proposal went to the contractors in March 1963. We completed evaluation on bids submitted and the contract was let to Lockheed in the latter part of 1963.

This system which has been complemented with additional equipment from time to time, is still in existence. In order to get a better rate of processing off our 7094, we developed a direct-couple concept which was later used by many of the different computer companies and was first termed as the "moonlight system," because it was done in Houston as a joint venture of our personnel and IBM people who were working without explicit approval of their company. There may be some reason why this should not be included. Let's look into the legality of it.

At this time we projected that our requirements for personnel would

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be well over 400 by 1964. This turned out to be a good projection, but since we were unable to get Civil Service billets to satisfy this need, we were obliged to contract with Wolf Research and Development for manpower support. This contract extended for a period of two years, and when the procurement action was opened again, the second manpower support contract went to Lockheed. Personnel growth has continued, and at present we have approximately 800 support type contract personnel, making the total division strength very close to 1,000 people.

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During the growth of the actual computer facility and personnel, the division also made a transition in direction. Around 1963, a new directorate was organized to take care of implementing a realtime computer center under Barry Graves. The division was placed under Mr. Graves' direction and remained there for approximately one year. After that the directorate was combined with the Engineering and Development Directorate under Dr. Maxime A. Faget, except for a small element that went to Flight Operations. The Computation and Data Reduction Division, also underwent a name change, becoming the Computation and Analysis Division. This redesignation was in order as we had added several types of personnel related to scientific and analytical work, including masters and PhD-level specialists in math, physics, and engineering.

The division itself has been reorganized a total of six times, each time adding and changing directions or objectives to fit Center requirements and enable our people to effectively monitor the contractors supporting the division. Phasing out of work on major spacecraft programs has been done in most instances fairly smoothly with no great upheavals.

Looking at the growth of the division, I think it is important to emphasize not only change in personnel but the change of the equipment, and the location of this equipment as the requirements of the Center grew. We were initially located at the old television studio on the University of Houston campus, and we had an IBM 1620 located in another building. (We will have to check the name of this one). As we contemplated our facility needs at Clear Lake, we discovered that the growth of computer requirements, at our Center and at other Centers, made it possible to project with some degree of latitude requirement for computers for future uses at the Center. We looked at the plans of the building and suggested that it needed to be at least twice the size that was initially planned for it. But due to cutting the budget, the size of the building was actually reduced and in addition the Library was located on the first floor of our building at the time of the move. As a consequence, we had immediate need for additional locations at MSC. As requirements continually increased, and we found ourselves strapped for space in Building 12, we added a facility at EAFB. Also in order to satisfy the requirements of Bldg 16, we located a computer there.

The continued shortage of the facilities required the Division to request additional space in 1964, and we were granted an extension to the building--some 32,000 sq ft as I recall. This never did come to pass however, as an equivalent volume of space became available in Building 45, and we were requested to accept it in lieu of the addition

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to Bldg 12, which of course we did. This was occupied for a period of one year, and at that time we lost most of it to the Apollo Project Office, and were obliged to locate other facilities. By 1967 we had a computer in Bldg 16, another in Bldg 30, and another one in the TRW facility. At the same time, requirements for hybrid computers were growing, and to satisfy this need we got an EAI 8900 system for that particular work. It was installed in Bldg 30 joining the 7094 floor installation there. To facilitate translating data and processing, we also established remote stations in many of the buildings. I will have to check from year-to-year for you as to where these were located. In 1966 we also were requested to supply computer time or satisfy the data processing needs of the Electronic Research Center in Boston. As a consequence, we installed a communications-type computer and began to supply this requirement. It continues at this time.

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As our equipment grew, we also had a tremendous growth in personnel. Initially the division was organized to supply all types of services: key punching, operators, programmers, analysts, systems people, and the various associated personnel. Our billets were limited to approximately 156. In order to supply these needs, we had to allocate functions, doing part of the work ourselves, such as writing the specifications for task assignments for new work, and monitoring the contractor assigned these tasks. We soon discovered that key punching maintenance and operation, and support functions could be done under contract, so we began a re-training program for our people who had been in such functions so that we could assign them to other capacities.

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By the end of 1966, we had essentially completed this task, and instead of having a completely doer type organization, we had a mix of doer and

monitor. The growth of the division has been tapering off since 1966.

307-b As to why we located computers in various buildings, as we did, I can summarize that information very quickly. In 1966, we took over the task of validating the onboard computer software contract with MIT from the G&C Division. As consequence we located the computer needed to satisfy that requirement in Bldg 16. It is a very nice facility, and has served very well in that location. The 7094 in Bldg 30 was located there because of the Mission and Planning Division under John Mayer was its prime user. Mayer's people could take care of their data processing without incurring a great deal of lost time through messenger service.

347-v When TRW requested authorization to purchase a 7094, the NASA Regional Audit Office showed that the cost of a computation facility operated by the contractor was far more costly than a government operated facility, so the Center took position that we would supply one even though it was an incentive contract for their data processing needs.

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347-v As we have extended our workload, and the state-of-the-art of computers has improved, we have changed computers from time-to-time. For example, in 1966, growth of our processing requirements was such that we were obliged to buy additional equipment to satisfy the projected load. The contract was given to the Univac Corporation, and in the latter part of 1966 we installed our first Univac equipment. The biggest problem in making this sort of change, was the conversion of old programs to the new operating systems. This conversion was essentially completed in the summer of 1967, and the contract itself now is nearing completion. By the end of 1967, we had installed a Univac 1106, a 1107, and four 1108's. 374-1 In bringing this new equipment in, we deleted the requirements for the

direct couple of the IBM 7094 and the IBM 7010. We gave Headquarters the IBM 7094, the 7010, and the 7040 as the load these three processors had been absorbed by the Univac equipment. We contemplate adding another Univac 1108 for data reduction, and will move our government owned CDC 3800 to Bldg 16 to replace leased equipment, which will result in a cost savings to the government of approximately \$100,000 per year. It is also expected to ease the data processing load, which has been growing steadily.

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The Computation and Analysis Division has been active in sharing of its resources with other elements of NASA and other Agencies. Early in 1963, as an example, we assisted in the organization of what was called a "share library" for NASA. This particular effort has grown, and in 1966 Dr. Mueller appointed MSC as the Librarian of the Office of Manned Space Flight in-so-far as program sharing was concerned. This was filtered out after the first efforts of putting together a document summarizing technical abstracts available. In 1968 MSC was appointed official librarian for all of NASA. Our share agencies and contractors at this time had grown to a total of _____, with the resulting cost savings to the government in 1967 of approximately 18 million dollars. Along the same line, the General Services Administration asked to become a sharing center, and a contract making this arrangement was signed by Dr. Gilruth with Mr. Dyer of GSA in September 1967. We are recognized as among the first GSA sharing Centers and the first NASA Center to occupy this role.

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Our Division personnel have become involved in a number of semi-official extracurricular activities. To mention a few, I am chairman of the Resource Sharing Subcommittee of the Inter-Center Committee, and am a member of the Resource Sharing Group of the Office of the Manned Space Flight. We work very closely with the universities. I am a member of the Board of Consultants with the engineering graphics group at Texas A&M, in the area of industrial engineering and use of computers with Texas Tech and on the Board of advisors to the Conolly Institute at Waco. I recently served as chairman of a NASA-industry ADP Seminar, the first of its type in NASA at El Paso. Several members of the Division staff are on the faculty at the University of Houston, and I can supply a list of their names and the graduate and undergraduate courses they teach. The division has been very active in participating in seminars and conferences of various types. In the past year we delivered a great number of papers, and I will supply you the number, the various types, and the locations, where they were given.