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ORAL HISTORY INTERVIEW

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SUBJECT OF DOCUMENT: [use relevant bold-face introductory terms]

Oral history interview with Roy L. Magin  
[full name of interviewee]

about Graphics Capability, Contracting and  
[main focus of interview]  
Standards

Title: 1962- Graphic Services Branch, Admin. Services  
[interviewee's current and/or former title and affiliation] Center Operator  
1968- Reproduction Services Branch, Mgt. Services  
Dr., Admin.

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 14; # tapes 1]

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

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Education - \_\_\_\_\_

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<sup>Langley</sup>  
Career Path - 1961 - joined MSC (graphic art services)

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Topics - <sup>technical</sup> illustrators, printing, reproduction services;  
Congressional approval for MSC field printing office;  
poor work <sup>& weather</sup> conditions in Houston; Ellington AFB  
operations location; in-house <sup>of contractor</sup> graphics capability; problems  
w/ managing contractors; locations in Farnsworth  
Chambers & Peachy buildings; 1965/66  
joining of printing & graphics areas; printing -  
Civil Service staff; Gemini Program got  
own graphics capability (others wanted it too);  
centralized vs. multiple graphics capability;  
graphics <sup>standards</sup> - 1968 NASA Handbook 1430.1  
w/ input from all centers; rendering  
techniques

UNITED STATES GOVERNMENT

# Memorandum

TO : BF6/Roy L. Magin

DATE: May 22, 1968

FROM : BN5/Dr. Robert B. Merrifield

SUBJECT: Preparation of a History of the Manned Spacecraft Center

As is pointed out in the cover memorandum, I have been commissioned to prepare a history of the Center. There is a large volume of information (memoranda, blue prints, sketches, etc.) available in the official files and, of course, I plan on exploiting it. However, such information is only the bare bones of history; I will also need intimate detail and personal insight from major participants and informed observers. It is especially vital that I have the benefit of the personal recollection of our key personnel who shaped the management philosophy of the Center during its early formative years. It is for this reason that I would like to have the privilege of spending a few hours with you, to help you put together a statement reflecting your knowledge of the Center's history.

If you have no objection, I will plan on using a tape recorder while I am with you, as it is a convenient way of obtaining a lot of information quickly and economically. I fully appreciate the fact that you have been involved in a seemingly infinite number of major activities, all of which are complex and of such significance that they cannot be disregarded in a Center history. At the same time, I recognize that your time is valuable and limited, and will leave to your discretion what you should put into your statement. I am interested in any information you consider to have been important in the establishment, growth, or maturation of the Center, and invite you to feel free to go into whatever depth of detail you feel advisable and within the limits of your available time. There will be no need to be concerned about grammar, structure, or repetition at this point. I will plan on submitting a transcript of this recording to you as soon as I can get it typed; if you wish, you may then amend or add to it.

I am keenly interested in those minor details that will add vividness and vitality to a historical narrative. For example, a key management decision may have been reached in one of those drab, crowded, stuffy conference rooms of the "Dolly Madison House" (rather than "at OMSF"); or the wisecrack or joke that relieved the tension or boredom or weariness of an important meeting; or the unprepossessing appearance of the Carla-battered Clear Lake Site. Although such details may seem trivial, their judicious use will make the difference between dull and interesting reading.



*Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan*

Because of your position and long association with the Center, it is quite likely that you are familiar with events where personality clashes, conflicts in judgment or other human failings have played a considerable role. The natural tendency in dealing with such sensitive issues is to avoid them or to gloss over them with generalities. Obviously, any history based on this type of treatment will be bland, innocuous, and superficial. On the other hand, if potentially explosive information were to be incorporated into a history, it would certainly lead to embarrassment or more serious consequences to the Center. As an alternative to these two extremes may I suggest the following: I would like to have your statement to be completely candid; I will consider it to be personal and confidential, and will safeguard it accordingly. After typing your narrative, I will return it to you for verification. At this time, I will ask you to indicate those portions of your statement which you regard as "privileged information." They would never be alluded to in any way in the Center history, and would have the sole purpose of giving me the necessary background information I need to write a factual and objective history.

May I call you in a few days to make arrangements that will be mutually convenient for me to see you?

Robert B. Merrifield



UNITED STATES GOVERNMENT

# Memorandum

TO : BF/6Roy L. Magin

DATE: May 22, 1968

FROM : AC/Special Assistant to the Director

SUBJECT: Preparation of a History of Manned Spacecraft Center

At the request of Dr. Eugene M. Emme, the NASA Historian, we have agreed to assume responsibility for the preparation of an MSC history. This effort is expected to complement programmatic histories (Projects Mercury, Gemini, and Apollo) which are either in preparation or complete. The MSC history will place primary emphasis on the Center as an institution--its general management philosophy, the evolution of its major organizational elements, growth and modifications of its staff, management of its financial resources and contracts, acquisition of its facilities, and its impact on the economy, culture and society of the community in which it exists.

Dr. Robert B. Merrifield, a professionally trained historian, has been asked to prepare this record of our progress from Langley origins to the present. Since he has been with the Center for over five years, Dr. Merrifield is familiar with many key decisions, events, and trends in the Center's past. However, he will need help from all of us who have been major participants in the life of the Center, particularly in interpreting why and how various forces have influenced the development of the Center as an institution. Your aid and cooperation in this undertaking are vitally important to its successful completion and will be appreciated.

*Paul E. Purser*  
Paul E. Purser



INTERVIEW WITH ROY L. MAGIN  
May 27, 1968

95 I joined MSC in August 1962. I was hired primarily to put together a graphic art services capability for the Center. I had been at Langley previous to coming to MSC, and there developed an in-house capability to support the graphic presentation requirement for the Mercury Program. As a companion to this, we also started developing the network for our reproduction and printing.

95 Our first major effort was to bring onboard the illustrating support services for the Center, and we initially hired four key illustrators most of whom had previously worked with me in the Department of the Army. Each brought highly specialized talents with them. Concurrently we hired Mr. Jakir who was to run our printing and reproduction services for the Center. He came with the same type of specialized background. He had worked with private industry, as a production manager in a reproduction photolithography printing establishment in Hampton, Virginia, and he and I had also worked together at various times in the Defense Department so I knew of his capabilities.

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208-2 Shortly after the announcement of the Center's location in Houston, we started putting together the justification for a field printing plant to be assigned to the Center. This required numerous trips back and forth to the Headquarters. Mr. Jakir was primarily responsible for developing this justification, and we were coordinating this activity with Steve Grillo head of NASA Headquarters Administrative Services. Steve was very instrumental in working with us to obtain this justification, which was no small task since it required congressional approval. Gladys McDaniel in

NASA Headquarters was then the printing control officer for NASA, and we met numerous times with her and Mr. Grillo to formulate this justification. We did not acquire the authority initially and we were all quite disappointed, because we had had hopes of getting this authority approved prior to moving to Houston.

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When we set up offices in Houston Mr. Jakir and I rotated on two-week assignments. We maintained a dual operation, in the Farnsworth Chambers Building in Houston and at Langley. Our first week in the Farnsworth Chambers building was wild. We had a time getting ozelid equipment down the delivery well in the basement of the building. We had reproduction equipment strung all over the basement, and we had artists and draftsmen working under very adverse conditions. There were amonia fumes, and a lot of activity detrimental to getting the job done. People were being hired who were trying to locate homes. We were working extremely long hours in those days. It wasn't uncommon for reproduction and graphics people to work two or three days in a row with very little sleep. The illustrators and the reproduction people in this point of the program were one single branch. We all worked for Mr. Aldridge, who ultimately became our division head, who reported to Marty Byrnes, who in turn reported to the Director for Administration. During this early part of the build up here in Houston, we had quite a series of relocations. The printing people started out in the Farnsworth Chambers Building. Then we moved to the Minneapolis Honeywell Building. It was a non-airconditioned area and this caused us all kinds of problems with out printing equipment. With unbalanced humidity conditions, the paper wouldn't run through the presses.

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It was an extremely hot summer. While all this was going on we were also trying to find a location that we could develop our printing capability to the maximum extent. Jakir and I had, in earlier trips to Houston, decided on locating in a building at Ellington. We recommended at that time that they join two buildings together which would give us a large open bay in which we could ultimately develop our full printing capability.

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At this point, which was in early 1963, we still had not received authorization to establish a printing plant. We wanted this so we could do photolithography which meant camera capability--an ability to make plates from negatives. In the early part of 63 the summer or the spring of 63, we were informed that our justification for having this printing plant was being denied and we went back through a concerted effort thru Mr. Aldridge and Mr. Byrnes to obtain this justification. Byrnes presented this briefing to the Congressional Committee, and Mr. Jakir, Mr. Aldridge and myself made several trips to Washington in formulating the final presentation to the committee on why it was necessary to establish a printing plant here. There was no other government printing facilities in the Houston area. Ultimately we obtained this authorization. In addition to the key work of Mr. Aldridge and Mr. Byrnes, we obtained excellent help from the Langley Research Center. Langley had been over the same hurdles some years back, so we relied on their help and experience in how they ultimately justified their own printing plant. Harry Hamilton at Langley was especially helpful in giving us the type of support we required. Once we had this authority, we could do our own printing.

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We began operations at EAFB, and the printing facility remained at

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Ellington until it was moved here to Building 227, which houses the printing effort in 1966.(?) In 1963 or early 64 the branch was reorganized. Two branches were created. One branch contained the graphics capability and the other branch consisted of the printing, reproduction, and distribution groups. Mr. Jakir was designated to run the printing and reproduction branch, while I retained the graphics branch.

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When we moved from Langley we actually had four people at Langley and the rest of the staff was recruited after we set up shop in Houston. We acquired people from the Marshall Space Flight Center who were highly specialized technical illustrators. We also hired people from the Edwards Research Center, again highly specialized illustrators to do conceptual work. We were able to hire locally several graphics technicians who were general illustrators. We blended this capability with our original complement. It gave us capability to do all our own graphics work in-house. We only contracted work on an overflow basis.

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We soon found that it was necessary to support the Center on a 24-hour basis, and we simply did not have the capability to do all support services with the limited staff we had. So we were forced to utilize contract services to a major degree. Most of us who had worked with the government for a number of years were reluctant to hand over big areas of work to the contractors because once you start it is the beginning of the end for an in-house capability. But at that time we had plenty of money and the support activities were under extreme pressure to get the job done, and the only way we could do it was to increase the volume of contract activity. Most of our people were hired without consideration of ability to do contract monitoring or contract management. They were

272-3 primarily technicians and highly specialized technicians at that. Since they were not accustomed to dealing with contractors, we had many problems. Some of these problems were caused by the fact that we did not have the clear understanding of how to do business with a contractor. In those days MSC organizations were scattered over the SE side of Houston. We were in the Farnsworth Chambers Building and the Procurement people were in the Houston Petroleum Center. It was difficult as the devil to acquire this knowledge of how to do business with a contractor in a very short period of time. We were able to get the job done but the understanding of the proper way to do business with a commercial concern was lacking and caused us a considerable amount of trouble. A way of doing business was to call in several small art studios and lay out the task to them. They would bid on this and inform us of what the price was. We would then inform Procurement. Since this network of communications wasn't the very best we encountered a host of problems. The funding allocations were not clearly defined, and sometimes we had a situation where we were expending more money than we actually had. The first news of this would come when Procurement just said stop everything. Everything began to go out of Procurement office and nothing was processed by our graphics people. To further complicate the situation, the resources management people got into a hassle over procedures with Procurement people and consequently we lost several good people. Although we were not management technicians, we have acquired this knowledge and our work has become more efficient. One of our better employees that we lost as a result of this situation was Bill Der Bing, who transferred to Public Affairs Office. We lost some functions in the process, and because of related problems or situations what

seemed to be the best of friendships was frayed. We have since gotten out of the BPA type system of contracting and have gone to a time and materials type contract with Hayes International. This system enabled us to efficiently manage a program of this magnitude. We now rely in part on in-house effort and partly on the contractor in order to do the job. We were able to contract the complete spectrum of graphics--charts and graphs, technical figures, highly complex technical illustrations, and artists concepts. This was not without problems, of course, because we had our own technically qualified craftsmen who were themselves proficient illustrators. When we started doing business with contractors who in some cases hired people with less capability (but of an acceptable level) we encountered resentment. We had a number of squabbles about what was acceptable and what wasn't acceptable, and frequently this involved the contracting officer. I can remember one case where one of our technicians took the position that some work done by the contractor was unacceptable, and we took this position because of the professionalism involved. This got us involved in a rather lengthy dispute with our contracting officer who ultimately took the position that he was as well qualified to exercise this type of judgment, and accepted the product. Since we had claimed the work was unsatisfactory we found ourselves in the situation where the contracting officer lost confidence in the graphics people and we lost confidence in him. Working relationships became extremely frayed and took us several months to get out of this situation. What we ultimately did to get around this problem was to enter into a new contract which permitted us to smooth over some of the other difficulties. The contracting officer agreed to delegate the authority to our technicians and professionals to accept or

reject work. This is the system we are using today, and it operates on the premise that we have the professional judgment sufficient to assess the quality of the product, quite apart from administrative determination.

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The situation that developed around the product being accepted by the contracting officer versus the technicians also involved the initiator. The initiator took the position that the material was unacceptable as far as he was concerned because of the poor quality of the workmanship. Of course this was the same position that the graphics people had taken. We pointed out that elliptical construction was all out of line and the proportions of the Gemini spacecraft were incorrect. At the same time the contracting officer was taking the position that this was an acceptable product, that he could exercise this judgement and did. We the graphics people and the initiator together considered the product unsatisfactory. We did accept the product and the product was reworked in-house with our own staff, and were able to please the project engineers or the initiators, but consequently it did cost us a lot of time and we lost a lot of confidence in that type of operation and with the contracting officer. The graphics technicians who then were being exposed more and more to this type of doing business and were at that point beginning to be affected.

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The graphics operation itself which started in the Farnsworth Chambers Building moved from the basement area which was very restricted in size up to the street level of the building in late 63 or 64. We maintained that facility I guess until about mid-64 or early 65 and then we moved to the Peachy Building, where we were housed until we moved to the site. The Peachy Building was segmented from the main stream of Center effort, and consequently Support Services were somewhat affected by this. The graphics



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people had to coordinate the entire product--from the initiator's verbal requirements or sketch to the artwork, and to the photo stage, at which time the photo people subcontracted the work to commercial houses in the Houston area. We were required to run a 24-hour type of operation. The artists worked all day and all night and the photo contractor would pick up the work from us, and perform their work at two or three o'clock in the morning and the end product had to be transported then down to Ellington where the printing people were, and the entire project had to be back at the Farnsworth Chambers Building for an eight or nine o'clock briefing. To get the product done it required many, many hours of work because of the physical location, but I don't think we had any major factors where we were not able to get the job done. As this philosophy of support services contracting was adopted, the graphics area began to be cut from its original complement of 15 people. As civil service positions became vacant, they were assigned to areas where support contracting was less significant. The spaces that were assigned to the graphics area and that became vacant through attrition were reassigned to the printing area, thus we were building up an in-house printing capability while we were contracting the graphics capability. This almost immediately started affecting the morale and the efficiency of the more proficient technicians. Once they became aware of what the circumstances were these people started looking around for jobs. From civil service staff of 15 we dropped progressively to where today we have only seven technicians in the graphics area. Some people were able to adapt to this, for example Stan Jacobosen. He is willing to give up his identity as an illustrator and assume responsibility for reviewing requirements, assigning them to the contractors, and then developing

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techniques to evaluate the contractor.

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We remained as two separate branches in the printing and graphics area until late 65 or early 66, when the branches were joined together again. During the time we were operating two separate areas, Mr. Jakir was able to bring in numerous highly qualified people and developed the efficient well organized in-house printing capability to what it is today. He hired Mr. Dave Spain, who had had 20 years of print-shop experience with the military, as his deputy and which welded together the abilities of technician with those of management experience. Mr. Jakir became the printing control officer for this Center and deputy branch head. Mr. Spain became head of our central operation control area where we now control the printing, graphics, and distribution functions for the Center to a single function control point which we were able to manage the total package from the single input. The printing area is staffed entirely by civil service people. We have 23 wage board employees, and do all aspects of printing economically, according to the government. We are doing printing at \$6.14 per thousand units of printing versus about \$15 for the same type service if we acquired it on contract. However, in the printing area we use Data Duplicating as our overflow printing contractor. The contractor is available on a 24-hour basis and works on a fixed price contract. He is required to work seven days a week, 24 hours a day if necessary, and does his job very well. The graphics area has about 54 contract people. These people are located off-site primarily and under the FEC-ITT contract. The distribution function which we now have in the branch is the augmented contractor facility and it is on site, housed in our main facility and is managed by Mr. Yucura who oddly enough was hired by Mr. Jakir when he was

the branch head of the Reproduction Printing Branch. He came to work, and found that in the meantime the organization in which he was hired was put under a different branch in our division and he never reported to Mr. Jakir. He was sidelined and reported to someone else. However, today, three years hence, we have him back under our wing and he is now working for us again.

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The satellite concept of operation was utilized in the graphics area. Our central facility was located initially in the Farnsworth Chambers Building and ultimately it was located in the Peachy Building. Concurrently we had graphics satellites which were augmented with civil service and contractor personnel. The civil servant was the monitor and several technicians were assigned to the monitor. These people were supplied by Hayes International or its predecessor. We had graphics satellites located in the VA Building which was in downtown Houston, supporting the Gemini Program Office. We had graphics technicians located in the Office City complex, which was the Apollo Program Office, and we had, prior to the close of the Mercury Program, people located in the HPC. After the official closing of the Mercury Program we still had graphics technicians assigned to assist in preparation of the final reports which were required for the Mercury Program. This satellite concept was started just before the conclusion of the Mercury Program and hit its peak just prior to the move to the permanent site at Clear Lake. Because of the heavy workload generated by many offices, there was an attempt by many to develop their own graphics capability. We were constantly asked to show why multiple graphics capabilities should not be developed throughout the Center. We took the position that this was an impractical and inefficient way to do business. We

won some of these battles and lost some. We were never able to convince the Gemini Program Office that they shouldn't have their own graphics capability. We ended up providing them with intermittent service, usually augmenting their staff people with graphics technicians on as a required basis but even at best this was a difficult situation to manage, because we could never tell when the people were selling us a bill of goods. The engineering staff always wants the capability right at their elbow and we attempt to convince them that we can do the job and do it more efficiently and economically through a central facility.

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In all of these satellite operations there was a constant concern on our part that these people were really doing the job they were there to do and not just as a matter of convenience. We were constantly badgered by the Personnel Office as to whether our people were being used properly, and whether they were being used in relation to the grade and skills that they had. Consequently we were always on the defensive. This concept of support was paralleled in Personnel, Resources Management, and other administrative organizations. We still have reproduction satellites to provide quick copy requirements. We no longer have any graphic satellites in operation.

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We have been asked at various times as to what measures of efficiency and standards were available in the graphics area. During the early part of the program we only kept track of man hours used, and through various management level reviews, invariably this question arose. In the graphics area unfortunately, even in industry, there are very few standards or very few people who are willing to discuss standards. There is too much individuality, too much creativeness that goes into the development of graphics.

269 For the most part there is an emphasis on time and materials as opposed to a standard. Early in the development of the Center, while coordinating requirements through Headquarters, we started working with Steve Grillo. He was interested in standards because of his affiliation with the printing committees. These committees established rigid standards and interest in cost factors. We suggested in early 1963 that a committee be formed at the Headquarters level to develop graphics standards. We were able to supply Mr. Grillo with categories of work which we felt were needed to develop any type of standard in the industry. We developed categories of requirements for graphics primarily as we saw them from this Center. These categories were put into the work statement used by our support contractor, as we also gave it to Grillo. It had the following organization.

269 Category one included all lettering artwork which ultimately was used either in slides or charts, or in direct presentations. This category was subdivided into degrees of complexity and we had category one "a" was lettering, "b" was lettering with line drawings and "c" was tabular materials; and in each of these areas we had a degree of complexity identified. Category "d" was statistical.

Category two was photographs and lettering, such as a photograph of a piece of hardware or a console with annotations or callouts on it.

269 Category three was diagrammatic type illustrations. It was broken down into sub-categories. "A" which was the diagrammatic illustrations, "b" realistic illustrations, and "c" tonal illustrations. These categories defined somewhat the type of rendering technique used. The diagrammatic illustrations used drawings or pen and ink rendering and only background coloring was limited to colored papers or zipa tones, or mediums

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which were already pre-determined in value and could be used as a solid for background cover. The diagrammatic illustration of a simple complexity would be one which was just a diagram, such as of the escape system plus the command module and service module and the adapter hooked on to the launch vehicle. It would be only configuration and very little interior as opposed to a medium complexity which gets involved with the working system or an arrangement of multiple parts. The complex work would expand into the example of a cutaway through an environmental chamber and would show the various layers of the fabric as they were cut through Category three "b" would be realistic, full-color illustrations of artist conceptions of spacecraft or the environment outside, such as the balloon experiment or the Apollo Lunar orbit mission. Category three "c" are the more complex delineations of facilities showing the cutaway part of the hardware actually located on the test stand. They involve air brush renderings and very intricate illustrations of the hardware itself. Category four are special charts which are nothing more than the extending of a line or indicating of tabular type material involved in milestone charting or PERT networks, budgetary reporting system to the Office of Manned Space Flight, etc. Category four is further broken down into patent drawings which are a technique of their own, brochures and cover designs. After Mr. Grillo's death, Dr. Shea and Nat Haines at Headquarters level pulled together a handbook to be used as visual information in graphics presentation standards. This type of input was solicited from each of the OMSF Centers, and the Research Centers. On this committee they had representation from each Center. Data was supplied and the committee reviewed it. In March 1968, NASA Handbook 1430.1 was

released as an effort of the committee. We are going to field test it for six months and then the committee will review all the data supplied by the Centers for evaluation purposes to further refine it. One of the things we were able to get out of this manual was a Table in which we defined by type of work and by kind the average number of man hours involved in this type activity. Each of the Centers indicated what they thought the degree of complexity was for each job. The tonal illustration area for example classifies a project of ximple complexity as 19.33 man hours; medium complexity, 63.13, and complex, 85.25. It may seem needlessly precise to talk about .33 and .13 but we feel it will ultimately supply us with a good yardstick to measure the efficiency of our people and enable us to tell our customers how long it is going to take to do a job.

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The rendering techniques that we use are primarily those which we have identified as being standard for charts, for direct presentations, or reproduction. We use as many mechanical aids as possible. We use a press-on type lettering, zipa tone or color aids, and colored papers, which we know will reproduce well in black and white or color. We use very little air brush rendering because it is very meticulous and time consuming. Where tone is required we achieve this through some type of mechanical aid most of the time instead of using the air brush rendering.