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[full name of interviewee]

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Interview conducted by Robert B. Merrifield - Staff
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Career Path - 1958 STG

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Topics - STG early growth; astronaut ~~selection~~ ~~Docs~~; early ideas on ~~sources~~; adjustment to STG pace & orientation; heart problems in general anxiety about move to Houston; controversial question: ~~can~~ man live in space?; controversy over astronaut activity during mission; astronaut training; bioastronautics; astronaut (pilots) resistance to being tested; technical facilities, labs biological testing; DOD labs; industry contracts; development of Life Support Groups; tension w/ DOD recruitment; STG work impact on families; need for in house test facilities; biosciences in ~~the~~ theory programs; ~~Shift at~~ ~~MSC~~ USAF School of Aerospace Medicine (SAM); space flight ~~testing~~ ~~experiment~~ + biomedical packages; oxygen atmosphere; Lovelace Foundation physical examinations; (April 1959) astronaut election; screening Committee

1397

DEPARTMENT OF THE AIR FORCE
OFFICE OF THE SECRETARY

MEMORANDUM

12 November, 1968

Dear Dr. Mumford —

I am returning the transcript with notations in the text. I felt that my thoughts needed clarification in places for understanding and some minor additions are added. I have no reservations on the use of the material as now returned.

I will appreciate receiving the completed transcript. Thank you —

Stanley C White

STANLEY C. WHITE, COL, USAF
Asst for Bioastronautics, SAFSL

Interview with Stanley C. White
7/26/68

I arrived at STG while it was still in its formative period, November 3, 1958. My arrival was ~~predicated~~ based upon a conversation Dr. Gilruth had with Dr. Lovelace and some of the people on an advisory panel that had been put together ~~by~~ for Bioastronautics. That medical talent or capability should be available within STG was accepted more on faith than anything else by Dr. Gilruth. He also apparently had been impressed by the fact that ~~there was~~ a group of specialists ~~who~~ were raising questions as to man's ability to survive in space. Three of us were assigned at the same time--one from each of the 3 services of DOD: Dr. Voss, Navy; Dr. Augerson, Army; and myself. We ~~then~~ came into STG at a time when it ~~which~~ was trying to get organized and at the same time to get ready to go out on its first task, ~~namely~~ that of putting out a request for bid on the Mercury spacecraft. This meant that there was both an administrative organizational buildup and a pressing technical problem being faced that was appearing simultaneously. Over that period of November-December there was a large growth in staff primarily from LRC, but ~~with~~ also some who were commuting from Lewis Research Center. There ~~might~~ may have been a few more who came out of the Washington area.

As the contractors went home to prepare their bids on the Mercury spacecraft, our rapid rate of growth ~~was becoming~~ became a problem as we had outgrown the space under the wind-tunnels on the west side of Langley field. During the next couple of months ~~we~~ the STG moved to the East side. At the same time, we became involved in trying to come up with a concept of selecting the first crews. In December 1958 and January 1959, at the request of Mr. Donlan and Dr. Gilruth I helped put together a selection program. Different alternatives were considered and reviewed by NASA Headquarters. For example, one of the candidate groups

Commercial aviation crewmen, military aircrewmen, submariners, balloonists, etc.

considered was race car drivers. It was also a period of maximum frenzy of trying to get many ~~splendored~~ things started and at the same time trying to form the first operational organization of NASA. This same tempo continued through the first year because as quickly as one area of work was finished, on came another, such as the spacecraft development proposals and then source selection board activities, etc.

At this point most of the work was keyed to just getting Mercury underway. Everything was strictly program oriented, and administrative activity sort of fit itself around that goal. Because of this need for buildup, there was a very interesting problem--how to ~~pick~~ collect the right type of people needed for STG. This uncertainty led to some interesting problems because ~~this~~ working in STG was a completely new environment for many. They would now have to meet technical deadlines, they would have to make judgments on partial data, and this was really alien to their whole career to this point which had been the exacting, academic, professional kind of existence characteristic of the old NACA. They had to undergo a major overhaul in their viewpoint of their job. Many of them could not make this adjustment and ~~went back~~ returned to LRC or their former parent organization. It peaked about the time the move to Houston occurred in 1961-1962, ~~and~~ the dropout of these individuals occurred then as it was a convenient time to go back to the kind of environment in which they felt more comfortable. At the same time they had to be replaced by people who were more oriented to an operational, tight-deadline kind of existence to get hardware built. ~~They were unable to polish and replenish it.~~ During this period the Center acquired a large number of engineers who were familiar with these disciplines from Avro. This was most fortuitous from the Center's point of view.

I think that the adjustment of these former Langley people was quite difficult. I recall an observation made to me by one of the local physicians in the Hampton area. He asked me if I had been acquainted with what they called the STG's heart and stomach syndrome. He explained that a number of people were seeking medical aid because of symptoms. Either they thought they had ulcers or were worried about their hearts. This was related to the high tempo, the feeling of anxiety on the part of many of these people for the demands of their jobs, and the fact that so much was depending upon their decisions, etc. They weren't being given adequate time to make hard decisions and they were paying the price. It got to be a common thing when a man would walk into a doctor's office with this kind of complaint, ~~in doctor's offices around Hampton area~~. The first question the doctor would ask was: "Do you belong to the STG?" Their batting average in predicting this just by listening to the symptoms was pretty good. This is probably consistent with what one might expect ~~sees~~ when there is a requirement to get moving with a very complicated program, and at the same time be asked to create something which didn't exist, namely ~~mainly~~ a manned space flight organization. At the time of the move to Houston, it should be remembered that some of the individuals who were making this move had spent practically their whole active career at LRC. This meant a major upheaval, of digging out the roots, and moving to a new city. They were going from a relatively quiet, ordered, slow-paced community where it was easy to hunt and fish, and were to be thrust into what appeared to be a very large, aggressive, vigorous city - Houston. Secondly, a number of people were recruited from other agencies with the expectation that STG eventually would move to Goddard. Many had houses in the Washington area, and expected to be able to

come back after a few months and reoccupy the house. These people had made a short interim move to the Langley area and now they were going to be uprooted again and thrust into the Center of Texas. This produced some agonized family decisions. I think NASA used good judgment in getting permission to let people fly down and look at the area. The weather couldn't have been worse when they started this program, because Hurricane Carla had recently passed through, and what is now the Center was showing its worst side when the people came on a visit. But the point is, they got to see the place, and to meet some people in the Houston area. This allayed a lot of the great anxiety especially for mom and the kids. Texans were friendly and other than the fact that the land was awfully flat down there, perhaps there was a lot of potential. Some even found there were things in Houston they kind of liked. The society was ready to receive them and absorb them and they felt they might even like it. The number of people who would have dropped out of the move would have been even greater if that visit had not been allowed.

While we were busy trying to get the spacecraft specs out on the market, there was an interesting discussion in progress that was internal to all the government and internal ~~probably to~~ also within the scientific community outside. This was the fundamental question as to whether man could live in space. This discussion then led to one of the key decisions which somebody should receive great plaudits for. Namely, flight was the only way to answer the questions. In the spacecraft design concepts there were great extremes of opinion as to what man's role in the Mercury spacecraft should be. Some wanted to put the man in a can, weld him in and ~~don't~~ not give him anything to do because he might mess it up, this was true particularly if it turned out he could not survive. At the other extreme, the individual who believed

that man in his usual flexible adaptable fashion would be able to conquer the new environment, and therefore if he was to be put up there, one might as well give him the information that might be useful and the means by which he might be able to do something about his existence. There had been about 1 year of study both in the government and scientific community on this problem, and had concluded that man probably couldn't survive in space. Starting under this kind of handicap, together with the fact that this same dichotomy in thought was still rampant during the initial phases of the design effort, constituted something of a kind of humorous tug of war. I recall one instance when the pressure obviously had been put to Dr. Gilruth to give the astronauts very little to do in the spacecraft. One of my most vivid discussions with him was outside the backdoor of one of the buildings, leaned up against the wall. It was an informal discussion on this very subject in which we agreed that we would never know unless we put everything onboard and that we could always unwire things but couldn't always be able to put them in at the last minute if we wanted controls, data, or instruments. Somewhere in that period of time, Dr. Gilruth got enough information from different sources to pursuade him to go that route and I think that was one of the things that gave the Mercury program a real leg up. One of the other interesting things here was not only did we have this tug of war as to whether man could live, but within the group who believed he could, there was a tremendous controversy over things necessary to keep him alive--training, conditioning, supporting information, etc. This naturally led into discussions as to what kind of a training program we should have for an astronaut. Answers ranged from those offered by the crew when they came--they felt they were test pilots and obviously

successful test pilots, therefore they should be trained like a test pilot. In the view of those who Others, ~~however,~~ felt it was important to know what we were going to ask the astronaut to do as far as duties and train for the specific events. Some questioned as to whether piloting an aircraft was really an equivalent relationship to what the astronaut would do. We got into discussions that an astronaut performs more of resources management and things rather than pilotage of this kind. Our first series of training programs ~~was~~ were both an experiment and also a compromise of the various things that people had suggested should be done. Astronauts sometimes went through a series of tests that were never repeated again. Obviously there wasn't enough gained to repeat it. After we got some experience and space flying time, we reaffirmed that some didn't contribute enough to warrant continuation in each subsequent group of astronauts. An example of this were the tests done on the crew where they were exposed to high level of CO_2. The chamber tests that were done at Bethesda in the Naval Medical Research Labs were discontinued because we had confidence we knew how to scrub CO_2 with ~~the requisite~~ reliability. In that particular case the training experience didn't contribute enough and the engineering solution to the problem gave us confidence that we could eliminate it.

In the relationship of the crew to bioastronautics and life sciences, the big question in the scientific community including the bioastronautics community in the early days of STG was can man live in space. Obviously if we ~~were to~~ answered that question in the affirmative, we still had to have some fairly good information which would answer other questions, such as would he be able to do any work in space. If the ~~assumption~~ answer was pessimistic--man cannot live, we still needed information to know the sequence of events that would lead to his demise.

The point being here that the crew in this case was the test subject. This was parallel to and equal in importance to the question of whether we could put enough pieces of equipment together to get something into space, maintain it there, and return it. In this regard, we again deviated from the test pilot experience, because we had 50 years of flying airplanes to draw on to show man's capability or limitations. In this program we were being asked simultaneously how will the hardware work, and how will man work? This controversy still permeates everything we do in this "Model T" era of space flight. We are still being asked not whether man will live or die--but, how does man work, how does he adapt, and what are his limits. These questions are still being asked, but they are being asked now in a positive way to do a better job of making man available for a flight. This last decade has been a very busy one in this regard, but I don't think we've done a very good job. We haven't gathered data that would be persuasive and the crews have offered overt resistance to being tested. It is very unfortunate and I believe this is one of the big reasons why NASA is having such a hard time justifying manned space flight to the national community. If we could have gained data in depth on normal man and his adaptations to space, I think a lot of the questions regarding what is the spin-off, the space program would have been answered. The crew felt their job was to be a pilot and get up there and fly the spacecraft. Anything we did to try to gather data on them was considered an imposition. Even within the biological group supporting the crew, there was a dichotomy. The flight surgeon worried about the guys drawing blood, taking time with the astronauts, and doing those other things that distracted them from what they considered their primary job, namely, that of piloting the spacecraft.

On the other hand, there was this biological test program that needed to be done which by its very definition had to impose demands upon the crew. I don't think there ever was a satisfactory ~~compromise~~ solution to ~~this~~ these divergent viewpoints. The ~~conception~~ was finally arrived at that we would be allowed to collect that data we were smart enough to ask for, ~~or~~ and also would allow the program to make judgments as to the crew's well being as the flight progressed in this point (a medical monitoring role). But the amount of quantitative data beyond ~~that~~ was pretty sparse. Maybe that was all we should have expected at ~~that~~ this time. This program was a very complex undertaking, but this did not help satisfy the needs of the scientific community and ~~which it~~ I might add, the community still wants the data.

The need for data and the requirements of the training program, led to the development of relationships with many outside organizations, primarily in the biological area. We were still in cramped quarters under the wind-tunnel at Langley area. Our organization and our technical competence were housed in temporary offices and we had no technical facilities of our own. We had to go elsewhere to run the tests we felt necessary. This included biological tests on the crew, all tests on equipment such as the space suits, diet work, etc. Whenever we needed any technical information we were obliged to search out a facility within the Government, industry, or a university to assist us. At the time, there was so much going on and we were being asked questions at a rate faster than we could generate the material. There had been very little bioastronautics or life science activity within the old NACA structure. The real support that was given to NASA was primarily by DOD and its many labs and it was just fantastic.

This was a very interesting bit of schizophrenia for the DOD. DOD labs had been created and in essence the DOD had been told to forget about space other than unmanned spacecraft. It was told to concern itself with airplanes. Now here was NASA knocking on the door of the DOD labs with a desperate need for information and faced with a demanding time schedule. The people in the DOD labs were really hard pressed to know exactly what position they ought to take. Fortunately, top level people of NASA and DOD got together and agreed that in essence DOD would support NASA as long as we would formally express what we wanted. This support was truly fantastic. I cannot recall ever going to a facility and having my request refused. They worked quickly with real expertise, and often were given such tight schedules that their people sometimes had to reduce the data on the airplane enroute to deliver it to us. In that early period, the staffs of these DOD labs were unsung heroes, getting us vital information in life support, environmental control, diet, and basic physiology of man in the space environment.

The interesting thing was that fortuitously the people who had been assigned to the STG by the DOD were of the school which believed man could make it in space. They had to recognize the reservations being imposed by the other group who said man will not survive in space. Perhaps it was good that all this information was pouring in, pressures were being put on us by the outside community, and this dichotomy of opinion existed as to man's role in space as it forced us to use a more conservative approach. I think we would have taken a more lacksidaisical approach if we had had our own way, but because we knew we were going to have to answer to someone we did insist upon more detail and more tests, etc., to try to support our position. In

relationship to the real world, when it came time to fly Mercury and subsequently Gemini and Apollo, this helped us persuade ourselves and others that we were on the right track, and that we had more than just barely provided for the man--we had a sufficient reserve and redundancy that we could have confidence that the crews would be able to survive and adapt to the rigors of space.

By this time it was apparent that if NASA was going to be in the manned space flight business, there had to be some buildup of inhouse test capability, especially since we had practically nothing. There was a great degree of suspicion that maybe we didn't need to build very much in this area over the first couple of years of space flight. But then it literally exploded when we finally got to the point where people were demonstrating the amount of work that had to be done in this whole environmental and life support area and the amount of work to be done in the operations, and the lack of availability of facilities of this type in the US. We had to be nearly self sufficient.

The first reaction to this conclusion was to hire industry. We could thus buy what we needed. But there was no place we could turn to other than the DOD where we could evaluate the total system. We were gobbling up more and more of the DOD's facilities, time, and people, because we were back gathering information, documenting it, and using it to build an operational confidence. This need for supporting the total area inhouse became very apparent. This occurred about the middle of 1961 and really took hold near the end of '61 about the time the move to Houston began. Also it became apparent that there was going to be a need for people to test hardware that was being developed and test it enough

to gain familiarity and have confidence in the testing that was done by the contractor. We first tried the concept that we would look over the contractor's shoulder but found it was impractical because we couldn't be everywhere at ~~every~~ the same time. These contractors were scattered over the US. The prime contractor was in St Louis. AiResearch was doing environmental control tests on the west coast, and there were other items being developed on the east coast, and there simply wasn't enough talent in residence at each place to watch every test. This resulted in the establishment of what later became Crew Systems or the Life Support Group. To do our job, we had to recruit people. Again, ~~because of this~~ the decision to get the DOD out of the manned space flight business worked to STG's advantage in the biosciences area because many of their most talented people, who were highly respected in the field, ~~and~~ realized that the next frontier was manned space flight, rather than aeronautics, ~~and~~ They sought employment with NASA. This put us in the enviable position of being able to pick and choose the individuals we wanted. We did not have to recruit anyone of the key people who formed the Crew Systems Division by proselyting. This enabled us to bring in very highly talented key individuals to form the nucleus of our group. When we moved to Houston we were able to build a strong organization with the addition of basically new college graduates, while using the "old hands" as the supervisors.

The fact that people were leaving their old organizations and coming to work for us did not help our relationship with their former employers, although it was solving our immediate staffing problems.

The losing organizations could see their best and youngest talent migrating to us. This situation created a degree of tension, and many times when I would make a visit to one of these organizations, I would encounter pointed jabs to the effect I was out on another recruiting drive? In spite of this, ~~our~~ the cooperation was really almost overwhelming. Similarly when we got to do the medical operations work and we had ~~to borrow people~~ with people for to augment the medical buildup for the flight. We had a choice of either building a large inhouse organization which would do this job or we could borrow some people for the immediate flight and then turn them back to their primary job after the flight was over. Again the three military service surgeon generals had this problem discussed with them and we were very gratified by their enthusiastic support. In spite of the fact that it ~~would~~ interfered with their primary job of taking care of their medical mission in the 3 services, they did provide the people. The Public Health Service did the same. When we went to talk with the Public Health Service their first reaction was - we got enough problems of our own - don't bring us any more. But that was quickly supplanted by the attitude that this was an area that required their support regardless of the problems and the support was forthcoming. One should never forget that the Australian civilian and military team also enthusiastically joined the program.

Another big problem the STG had was the need for its people seemingly to be continuously on the road. This caused a large amount of internal strife among families. It also was a big consideration when it came time to decide whether man would stay with the program. The family that had been fairly close knit in the old Langley environment, ~~and~~ where the man ordinarily expected a short TDY once or twice a year, found that Father now was on the road 1/3 or 1/2 of the time. I was able

to observe this because I was in the military and was used to being on TDY. This was part of the job as far as I was concerned. But for those for whom this was a new experience, this was a great shock. As we got into the operational phase, the length of the TDY trips became longer and longer. Finally when we got to the point where we were commuting between Langley and the Cape, they could be gone weeks at a time, and this became a very testy area as far as their families were concerned.

As the Mercury program progressed, we developed the need for doing test work inhouse. Also as the equipment coming from the contractors became available, we found the need for certain kinds of facilities. Using Mercury experience as a foundation we tried to extrapolate it in terms of what the new programs would demand. This pointed, sized, and gave us something of the timeframe in which these facilities needed to be built. Out of this, we designed with the architect, our niche in the new compound in Houston. It's important to note that many decisions were made on the basis of program needs and administrative support organizational structure, etc., ~~were scaled to those needs~~. For example, about the time we were moving into temporary quarters in Houston, we began to hit our stride in Mercury operations. We had facilities that we needed to run tests, and even more important, after a flight in which we'd had technical troubles we could use these facilities to reconstruct the event and come up with a solution. A good example was the freezing heat exchanger. Our boys in the lab ferreted out the cause and were able to come up with a solution, so that we were able to ~~employ~~ a solution on the next flight.

About that time we began were able to provide offer support for the Gemini program. Up to this time, it had been a sort of closed McDonnell-to-Mr. Chamberlin operation. Many life support aspects had been neglected or passed over lightly, and we had a lot of catching up to do. This scaled the organization, the facilities, and the technical work that had to be done. Coincident with this also was the early work on what was to be the circumlunar flight and still later evolved into the lunar landing flight. Coming about the same time as they did, the programs all and all having great demands upon our in-house talent, had a significant impact on the volume and pace of our recruitment effort, and dictated the facilities we would need. Since we could see at least several years ahead we could begin to scope the magnitude of the facilities and the organization that would be required.

This Early in the Mercury program was a unique period in the history of biosciences. We had the ability within one organization, to take a program from concept to actual flight and postflight analysis. We had all the engineering, testing, operations, and the recapitulation capability after operations within one organization such that there was talent available at whatever level necessary to solve problems. If a guy man at the Cape ran into trouble on the spacecraft, he could pick up the phone and get support from people in the technical areas. Conversely when something was done in the lab and it was to be retrofitted into the spacecraft, it was a matter of calling a guy the man who understood the situation, at the Cape. The problem It was discussed with him ahead of time so that when the change was made, it did not entail a loss of fidelity or knowledge of spacecraft systems. This was extremely valuable.

With the move to Houston, there was a major ~~another~~ management change- Operations was split off from engineering. Program offices were created which sort of straddled the area between engineering and operations. A discrete schism took place and operations went one way and engineering another. This was at considerable cost, as there was a lot less flexibility and technical backup for the final Mercury flights as compared with the earlier arrangement where the engineer at the Cape could pick up the phone and call a man directly ~~guy~~ on some problem. Now if he called, he didn't always get fidelity of information. From examples, Adjustments were made on the ECS emergency rate valves, water needle valves, on heat exchanger, etc., and on the urine pump system. The boys at the lab ~~had~~ worked out ~~a~~ solutions to the problems from previous flights, but somewhere between Houston and the Cape something got lost in the shuffle. We found it necessary to send our lab people TDY to the Cape, ~~to serve~~ on a consultant basis, to insure ~~be sure~~ that there was no gap or loss in information. In other words the split that occurred worked a disadvantage in biosciences. The regional organization concept ~~only benefit was that it~~ created an opportunity for a good exchange of information between the lab engineer and the environmental control engineer on flight operations console. There was a tremendous transfusion on the technical side. The man at the bench who came up with solutions to technical problems had a chance to evaluate his solutions) world of spaceflight. This) new systems sit down in reality ~~with them and~~ prevented our organization from degeneration into an ivory tower group disengaged from the problems of the real world.

The school of aerospace medicine helped us in several ways. We had space on some of the early Little Joe shots and they had been developing small biomedical packages up to and including a monkey package, and we offered them the opportunity to fly it. This was in the period of time where people were still having great anxiety about whether man would be able to sustain his life, so this fitted into giving us an opportunity also to get one more example of an experiment flying where it was alive, and we had the opportunity to see it fly, to bring it back alive to give us a little more confidence that our position or approach was correct. Later they also provided us with a tremendous amount of assistance in our atmosphere selection. In proving the value of the 100% oxygen atmosphere in Gemini and Apollo, they did a lot of the test work for us. The Gemini and Apollo program office people were very suspicious of 100% oxygen, especially for missions of 14 days duration and it was through a series of tests performed by SAM people that demonstrated that 100% oxygen was tolerable for a 14-day period. They also helped us train our medical monitors. In stationing medical monitors around the world in our stations, we were trying a new venture. The idea of trying to assess man's well being electronically either via telemetry or through voice communications was novel. Telemetry data had to be interpreted by the medical monitors so that they would be able to detect deviations from normal, healthy physiology, predict the stress and strain of spaceflight, and the changes in normal physiology concomitant to these stresses and strains. The School actually wrote a program for us, and in retrospect it was a very remarkably accurate and advanced study.

Now it has gotten to be old hat to transmit heart tracings, etc., by telemetry but at the time we were doing this, it was revolutionary. Complicating the School's participation was ~~the~~ a tug-of-war that had gone on earlier over who should do the aeroginal physical examinations for selecting the astronauts. SAM was volunteered on behalf of the Air Force, Walter Reed was volunteered on behalf of the Army, and Bethesda was volunteered on behalf of the Navy. The Public Health Service decided that if we insisted they ~~could~~ would do it. Because of this controversy, an independent agency, the Lovelace Foundation, was picked. Lovelace had been performing special exams for special mission work, so they had some good experience applicable to our problems, but essentially their use enabled us to get out of the ticklish problem of having to pick one over another of ~~our~~ the government agencies. Subsequently, the School of Aerospace Medicine ~~was~~ has been assigned this responsibility and it has been very useful being able to send people over to another agency, get a rather comprehensive examination, and yet allow the final decision to be made by NASA. ~~This~~ The use of SAM made sense because SAM also does most of the examinations for AF test pilots and special missions people, as well as looking after all of the Air Force's medical problems ~~children~~ who are on flying status and who have difficulties which are at a point of ~~controversy~~ (to be controversial) or where there is some doubt as to ~~whether~~ the man's ability to continue flying. SAM represents a tremendous repository of people and experience that allows us to get a man-oriented flight-oriented medical examination of high caliber.

The selection of astronauts was an evolutionary process in which we arrived at the decision to use test pilots. They were picked primarily because their profession was flying which was considered somewhat related to what the astronauts would be doing, and in addition they were people who were used to working in a risky area, and the fact that they survived was considered a good demonstration that they were successful. We were looking for people who would give us a reasonable chance of being successful as astronauts. We now had a possible family of candidates that we could select from. They were in the military which enabled us to have easy access to the record that every military man has, and allowed us to look over these individuals without raising any kind of commotion. A group of us went to the Pentagon and reviewed all the pertinent records of Navy, Air Force, and about 21 Army Officers. Dr. Voss, Dr. Auguerson, Warren North, Mr. Bob Champine, a test pilot at LRC, and I. We had around 600 such candidate files. From this group we screened out those who failed to qualify as to age, size, etc. We wanted young, healthy, experienced individuals. From the 600, our initial screening reduced the number to around 115 possible candidates. The biggest and toughest criteria we had established was the age limitation of 35 or younger. We found as we went through the test pilot population that most of them were older than 35, and that to have continued to adhere to this criteria would have wiped us out. So we raised it to 40 and were able to get the 115 candidates.

We then started bringing these people in for interviews to find out what we could as to the validity of their records and how they felt about this program, because it was strictly voluntary. We arbitrarily split them into 3 groups of roughly the same size. We planned to bring them in at the rate of one group a week, interview them, and conduct preliminary psychiatric screening. They would also take a series of aptitude tests emphasizing mathematics, engineering, and problem solution. This would give us some idea of profile aptitude before considering them further. They were offered the opportunity to volunteer or not to as they chose. We never had to get to group 3 because we had more than we needed ~~in~~ after the first two groups.

The screening was done by Mr. Donlan, Mr. North, ~~a Dr in personnel~~ Allen Hamble (from Hq NASA Personnel) (who had worked with us in working up the job description), ~~etc.~~, and I ~~(at different times~~ during the 2 weeks), Dr. Levy from Wright Field, Dr. David Kritzes from Navy, ~~and Dr. George Ruff from Wright Field~~ DR GEORGE RUFFAND and handled the psychiatric and psychological testing of these individuals. Dr. Auguson and I screened records from a medical point of view to find out whether the candidate had any obvious discrepancies which would preclude them from passing ~~a~~ an upcoming and rather stiff medical examination. From this total screening we were able to get a group of 33 which we recommended to be continued in the selection program. They were then sent to Lovelace Foundation and spent about 7 working days there and at Wright Field for five days where they were given an extensive amount of stress testing. This data then was collected and both the medical and the stress test data was brought to STG for review. From this review ~~we~~ 18 were recommended ~~18~~ to the final selection board. The

last two or three of these 18 were recommended with some reservations, the reservations being of a medical nature. We didn't have to worry about them, as none of the people picked were in our reservation category. Mr. North, Mr. Donlan, and Mr. Purser and I participated in the final selection. The 7 individuals who by this time had all volunteered and had passed our physicals, were asked if they would accept, and of course the answer in all cases was yes. This completed the selection process, and they came aboard about April 1959.