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ORAL HISTORY INTERVIEW

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OFFICE OF PRIME RESPONSIBILITY = JSC  
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AUTHOR [Interviewee's Last Name] = SANDERSON  
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SUBJECT OF DOCUMENT: [use relevant bold-face introductory terms]

Oral history interview with Alan N. Sanderson  
[full name of interviewee]  
about U.S. Weather Bureau - 1963 Weather Bureau weather forecasting  
[main focus of interview]  
# monitoring during space flight missions.

Title: 1963- Weather Bureau, MSC  
[interviewee's current and/or former title and affiliation]  
1968- Weather Bureau, 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]  
master 1

## CONTENTS:

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

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

Career Path 1943-47 Air Force meteorologist & weather officer.  
 1947-50 Airlines meteorologist; 1950-52 Korean War duty.  
 1953-U.S. Weather Bureau; 1962-<sup>Nate meteorologist center, Wash DC</sup> head  
 MSC Weather Bureau office; 1966 - Chief  
 of Space Flight Meteorology Group

Topics - 1960 - NASA Contract with U.S. Weather  
 Bureau; 1962 MSC office on Gulf Freeway;  
 reimbursable contract under <sup>MSC</sup> Flight Operations  
 Directorate; forecasting & <sup>mission</sup> planning role;  
 supervision of weather room construction.  
 Gemini & first flight w/ weather data from MSC.  
 6-8 on <sup>24 hour</sup> duty during missions; Honolulu liaison;  
 Contract shift to NASA Hq; 1966 reorg of  
 Space Flight Meteorology Group Operation Support  
 Division into Space Flight Meteorology Group (Forecasting)  
 and test range Coordination branch;  
 non-mission daily forecasts; wind & wave forecasts  
 for "Retriever" ship; support for high altitude  
 Balloon work; Cosmic Ray Ionization Spectrum Project  
 (CRISP); Earth Resource Aircraft Program;  
 consultation & <sup>public</sup> liaison w/ Weather Bureau, experts.  
 KSC office for pre-launch forecasts; <sup>info. integration</sup> Station duties during missions.

1386

November 25, 1968

Sandy,

The transcript of your interview, edited to remove extraneous material, is attached.

If you will, please read the statement and mark those sentences with brackets [ ] that you would not want alluded to in a Center history for reasons of embarrassment to an individual or the Center. As I mentioned during our recording session, this interview is to be part of the source material for the history, and it is doubtful that I will quote from it verbatim. Therefore, please don't worry about a sentence here or there which might not be as polished as would be desirable were it to receive public scrutiny.

If you want to add information feel free to do so. Just tack it on at the end of the statement, unless you prefer that it be inserted into the text.

After you return the transcript to me, I'll send you a copy for your personal file.

Thanks,

Bob Merrifield  
BN

Bob -

OK by me

Sandy

Interview with Alan N. Sanderson  
10/24/68

63  
NASA approached the Weather Bureau in 1960 with a request to form a group of Weather Bureau meteorologists to assist the NASA's Project Mercury effort. I wasn't a member of the group at that time and so what I have to say about it is second hand information. The Weather Bureau agreed to organize a group of Weather Bureau meteorologists on reimburseable fund basis for NASA. A man by the name of Kenneth <sup>A</sup>Neigler was put in charge of the group and his office was located at Suitland, Md. His assistant was Richard Brintzenhofe. After they began work, they realized they needed a liaison man at Cape Kennedy, so a two-man office was opened there under Ernest Amman and his assistant, Harlan Higgins. Since most of the manned flights were going to be flown over the tropical latitudes, it was felt that they should avail themselves of the expertise of the Weather Bureau tropical meteorologists at Miami, Fla., and therefore it was decided to create another office in M iami, Fla. The man put in charge of that office was Jesse Gulick.

208-1  
The Group functioned under a NASA contract through most of the manned Mercury shots. Then when NASA established the Manned Spacecraft Center in Houston, Texas, it was realized that another office would be required there. I was the one who was picked from the Weather Bureau to head up the Houston office. It was set up in July 1962, and the permanent original compliment was Roger Carter and me. We became permanently established at Houston around December 1962. We were then in the HPC building on the Gulf Freeway.

272-3  
 276  
 The whole Weather Bureau group was on a reimburseable contract under the Flight Operations Directorate, and Bob Thompson, head of the Landing and Recovery Division was our point of contact. Of course our prime job at that time was to provide ~~any~~ climatological advice, the operational forecast for the remaining Mercury flights, and to aid in the advance planning of the Apollo and Gemini Missions. In addition, we had to plan, design and supervise the construction of current weather room in Building 30 in terms of communication lines, meteorological ~~communication~~ equipment, and the necessary interface with the console of the flight controllers, voice loops, closed circuit TV, and pneumatic tube system, and all the other equipment used during a mission.

258-1  
 We moved down to the Clear Lake Site in June 1964. We still had just a two-man staff. We continued to prepare for the Gemini Missions and became operational at the same time that the rest of the MCC did. Gemini 4 was the first flight for which weather data was provided out of the Weather Bureau's facilities in the MCC. Our staff was increased in the spring or early summer of 1965. Allen Cummings, Edward Mitros, and Ronald Gabriel were added so by the end of that year we had a complement of 5 people. This has remained our maximum level of staffing. Some of the original group of 5 have transferred, but during mission time we borrow people from other offices in our group and <sup>a</sup>staff of 6-8 are on duty here 24 hours a day.

258-1  
 About midway through the Gemini series, we realized that the landing for the Apollo lunar mission would be the Pacific and we felt it was important to establish ~~our~~ <sup>an</sup> office close to that area. Therefore, a one-man liaison unit was opened in Honolulu under Oliver Garden to do the advanced planning for the Pacific recovery. This man also provided forecasts during



the Gemini series. Local Weather Bureau people also augmented this staff during missions, and provided 24-hour a day coverage.

258-1  
With the reorganizations that took place in NASA in the late 1964-1965, it was realized that it would be an awkward situation to have this group of weather people under a Manned Spacecraft Center contract doing support work at KSC, so Phil Boulger at NASA Headquarters had our reimbursable fund contract placed under NASA Headquarters. In early 1966, the Space Flight Meteorology Group was reorganized and Ken <sup>A</sup>Neigler in the Weather Bureau Headquarters was placed in charge of the Space Operations Support Division which consisted of two branches. One branch was to act as a coordinator for the Weather Bureau staffs supporting the various test ranges - The Western Test Range, Wallops Island, White Sand, Hawaii, Eniwetok, and Kwajalein, and Picayune, Miss. The other branch is the Space Flight Meteorology Group. At the time of this reorganization, I was made head of that group. From that time on I was responsible for the operational weather support during a mission and served as liaison between the Group and the MSC and for operational matters ~~and~~ with NASA Headquarters as well. With this reorganization we had to have a man in charge of the Houston office or section, and originally the man selected for that job was Allen Cummins. He has since left, and was replaced by Richard Siler.

306-1  
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Obviously we do most of our mission operations work with the Flight Control and Landing and Recovery Divisions. During non-mission times, we provide daily forecasts for various test operations that are being conducted by the Landing and Recovery Division. These may involve parachute drops at EAFB, Ft. Hood, and elsewhere. For operations of the Landing and Recovery Division's Retriever in the Gulf of Mexico, we provide

wind and wave forecasts and any other operational weather forecasts required.

333-1  
We provide Joe Algranti's people with forecasts for periods when the LLTV  
is to be used, as it can only fly when the winds are less than 5 miles an hour.

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357-1  
We provide them with forecasts two or three times a day while they are  
trying to get these tests completed. Similarly we provide support to some  
of the high altitude balloon launches. These are conducted by the Science  
and Applications Directorate for either the "Happy" project or the

343  
"CRISP" project, and high altitude balloon work being done up in Alaska  
this winter and in Iceland next spring. Usually this type of information  
deals with statistics on the upper winds, frequency of cloud coverage,  
precipitation, temperatures and operational weather forecasts for the CRISP  
project (Cosmic Ray Ionization Spectrum Project). (The CRISP launches will  
be from Holloman Air Force Base, New Mexico and recovered off the coast of  
California. We will also provide the forecasts for the recovery operations  
and probably will be consulted by Air Force meteorologists who will handle  
the launch and inflight phase). NASA Headquarters <sup>was</sup> ~~is~~ involved in launch of  
405  
the stratiscope balloon in Pal<sup>e</sup>stine, Texas as of the beginning of the  
year, and ~~has~~ asked us to provide help. We were consulted in the forecast  
of the local launch conditions for the flight that was flown last spring.

379  
At the present time, we are becoming more and more involved in providing  
forecasts for the Earth Resources <sup>Aircraft</sup> Program. We have provided support for  
their flights when they were staged out of Newfoundland and Iceland. These  
flights used a scatterometer to measure sea states - seas ranging from calm  
conditions in excess of 25'.

During non-mission times we serve as staff weather men. Anyone with

405  
weather problems can come to us for consultations, advice, and recommendations. This requires jack-of-all trades type of ability in the meteorological world, and although we don't claim this ability, we do have ready access to the various experts in the Weather Bureau who are involved in specialized areas. For example, the Bureau has atmospheric pollution experts who are familiar with dispersion, say of contaminants such as toxic fuel. The Bureau also has instrumentation specialists and any other specialty that is needed.

605  
The Spaceflight Meteorology Group of which I am Chief, has 5 locations, offices or sections. One is located at KSC, is headed up by Ernest Ammons<sup>A</sup>, and at present has a compliment of 9 people. We have an office at Miami with a compliment of 6 people, headed up by Jess Gulick. The section at Suitland, Maryland, is a 4-man office, headed up by Richard Brintzenhofe. The section at Houston is headed by Richard Sigler, and his section consists of 4 people. The liaison office at Hawaii is a one-man operation.

705  
My own background consists of a tour of duty in the Air Force 1943-1947 as a meteorologist, and a weather officer. After getting out of service, I went to work for the airlines as a meteorologist until 1950, when I went to work for the Weather Bureau again as a meteorologist. I was recalled for 2 years of active duty in the Korean War and returned to the Weather Bureau's National Meteorological Center in Washington, D. C. in 1953. I was there until transferring to the Space Flight Meteorology Group. I have 25 years forecasting experience. Roger Carter transferred here from the Weather Bureau Office at Austin, Texas, where he was working as a forecaster. He has about 8-9 years as a forecaster. Richard Sigler, has been in the Weather Bureau for approximately 20 years. He had previous assignments with the Space Flight Meteorologists Group before filling this position. Edward Mietrose



is a meteorological technician. He has had approximately 25-years experience as a forecaster. He previously served as an enlisted Marine forecaster and when he came in the Weather Bureau his lack of a college degree only qualified him for a meteorological technician. <sup>SEARL</sup>~~Cyril~~ Richards transferred here from Amarillo, Texas, where he worked as a meteorological technician for approximately 6 years.

343 Prior to launch, a key consideration is the forecast for the launch area weather, and our Cape Kennedy office handles it. Miami, Suitland, <sup>CAPE KENNEDY</sup> and Houston offices are all linked on a voice facsimile circuit, and all forecasts are discussed and coordinated. The forecast is not necessarily one man's opinion, but rather the joint opinion of all the experts "in the Group." Prior to launch, the Cape Kennedy office is the prime Weather Bureau unit, and after a launch the Houston Weather Bureau office takes charge. We are responsible for knowing the world-wide weather conditions and how they will affect recovery operations. Landing and Recovery Division has ~~a~~ planned target point where the ships are located for every revolution of the spacecraft. Similarly, they have an alternate target point which would be covered by aircraft each revolution. In order to provide the weather information for the planned recovery operation, Houston serves as a briefing office. We use forecasts that are provided for us by the other sections. The Miami section is responsible for providing detailed forecasts for all the planned target points in the Atlantic Ocean where the ships are located. The Honolulu office is responsible for providing the detailed spot forecast for all the planned target points in the Pacific Ocean. The Suitland Office is responsible for providing general forecasts for all the alternate target points and for giving us a general forecast for the wind and sea conditions, and clouds and precipitation on all other areas of the ground track. Since

Since we get these inputs from three different locations, we require a system that can integrate these forecasts. The way we do this is to have a world-wide forecast man available for briefing the recovery coordinators, flight director, and mission director and their staffs. Suitland office prepares this world-wide forecast map and the detailed forecasts prepared by Miami and Honolulu are incorporated into the Suitland product. In addition to providing world-wide weather support for recovery operations, we also prepare world-wide weather information for the experiments that are conducted during the mission. Primarily these are just experiments that are concerned with targets on earth where the sighting of these targets would be hampered by the presence of the clouds. Therefore our experiments support really become<sup>s</sup> a problem of forecasting the amount of cloud cover over the target site at the time of the spacecraft's flight over it. Then there are other experiments such as the weather photography experiments requiring forecasts for certain desired cloud formations such as those of hurricane, typhoons, squall lines, and other such phenomena. Terrain photography requires an absolute minimum of clouds, and preferably clear conditions. The weather forecast is important as it permits real-time flight planning of the experiments schedule and thereby more effectively budgets the use of fuel used in orientation of the spacecraft so as to provide a view of desired targets. During a mission we may also provide world-wide weather information for the other mission-associated activities. For instance in Apollo 7 we maintained the typhoon watch for the tracking ship Mercury which was located near typhoon "Gloria" in the Western Pacific. We also monitored the weather conditions in the vicinity of the tracking stations so that we could provide forecasts for them if needed or requested.

At times we are asked to provide cloud forecasts for the various airplane missions that are flown to support the space flights. These aircraft may be based in Australia, South Africa, or almost anyother place. During mission time, all this information is scheduled so that each oncoming shift in the recovery control room or the mission control room get a briefing or status report on the weather conditions to be expected during their tour of duty. Normally this means three shifts a day or approximately every 8 hours. We have all this information ready for dissimulation.