

NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT

ORAL HISTORY TRANSCRIPT

JOHN W. HOLLAND
INTERVIEWED BY SANDRA JOHNSON
SEABROOK, TEXAS – 19 FEBRUARY 2004

The questions in this transcript were asked during an oral history session with John W. Holland. Mr. Holland has amended the answers for clarification purposes. As a result, this transcript does not exactly match the audio recording.

JOHNSON: Today is February 19th, 2004. This oral history interview is being conducted with John Holland, in Seabrook, Texas, for the NASA Johnson Space Center Oral History Project. The interviewer is Sandra Johnson, assisted by Rebecca Wright and Jennifer Ross-Nazzal.

I want to thank you again for agreeing to talk with us today. I'd like to begin by just asking you how you first became involved with NASA.

HOLLAND: This may take a little while, but we'll get into it here. In December 1961, I received a phone call from Gene [Eugene G.] Edmonds. I'd known Gene for a number of years and we'd both been in commercial and portrait photography for many years. We were in direct competition with each other and still remained good friends.

Gene told me about his work with NASA and that he had planned to join the Space Task Group and go to Houston [Manned Spacecraft Center/Johnson Space Center, Texas]. Gene had talked to his Division Chief, John [R.] Brinkmann, and he wanted to know if I'd be interested in joining the Space Task Group. It was a busy time of the year for me at the studio, and I said, "Merry Christmas, Gene."

In early January 1962, Edmonds called again and asked if I had thought about Houston. "Not really." Gene wanted me to meet John Brinkmann and he would give me more detail on

the job he had in mind for me. I went for an interview with John Brinkmann, and he painted an interesting picture for me as he wanted me to help set up a photographic processing laboratory second to none in the country.

I went home and discussed this with Judy. Judy's my wife. We had a lot of sleepless nights, and finally, we decided to make the move. I sold my studio, transferred from Naval Weapons Station in Yorktown, Virginia, and went to NASA-Langley [Research Center, Hampton, Virginia]. We put our house on the market, and on February 1st, 1962, I reported to Brinkmann, who was the Division Chief of the Space Task Group, for my first assignment.

Brinkmann told me I would be interviewing technicians for special laboratory functions, selecting and ordering photographic equipment, helping design the laboratory, working with the Eastman Kodak Company on new and advanced films and equipment, "And by the way, John [H.] Glenn is scheduled to have his first orbital space flight, and I want you to join Edmonds in the recovery area in the Caribbean. The big thing is, you will leave in one week."

I worked with Edmonds on setting up and picking up necessary photographic equipment, such as motion picture and still equipment and other gear that was needed for the assignment. We reported aboard the aircraft carrier *Randolph* in Norfolk, Virginia, and departed Hampton Roads [Virginia], with a destroyer escort, for the recovery area.

The second night aboard ship, the admiral's aide came to my quarters and told me that "Admiral Eastwald will expect you at dinner tomorrow evening. You will have on a coat, a tie, a shirt, and I will pick you up at 1830."

This all went very well that evening, and I was seated on the right-hand side of the admiral and a NASA engineer was on the left-hand side. Everything was going real great. During World War II, I was in the South Pacific, and the admiral, he was also in the South

Pacific, so we had quite a conversation going there, which made it real great. He said, “Holland, you’ve had a lot of experience in your life, and, by the way, how long have you been with the space program?”

I turned every cotton-picking color in the rainbow, believe me. I said, “Today makes twenty days, sir.” He threw his head back and just gave a big heehaw and so did all of his staff.

Anyway, he said, “Well, Holland, everyone has to start someplace. Good luck to you.”

John Glenn’s launch was great and the entire mission was highly successful. With a splashdown in the Caribbean, Edmonds covered Glenn’s landing and was transported back to the aircraft carrier. I photographed Glenn when he was flown back to the area in a helicopter. After collecting all the film and TV [television] material taken by the news media group, Edmonds and I left the carrier, with John Glenn, in three separate aircraft, for Cape Canaveral [Florida].

From the Cape, I went to the nation’s capital in Washington, D.C., and photographed John Glenn briefing the [United States] Congress on his space flight. This was followed by a full-dress parade down Pennsylvania Avenue, with John and Annie [Glenn] in an open convertible, waving to the thousands of people cheering the new space hero.

Okay, back to Houston. My first office in Houston was at the Farnsworth [&] Chambers Building on Telephone Road. I interviewed a number of people, laboratory technicians, chemists, clerical help, and contacted manufacturers on various space-type equipment that would be needed. I needed black-and-white and color motion-picture processors, optical printers, laboratory equipment, contact printers and so forth.

The first laboratory was at Ellington Air Force Base [Houston]. We reworked an Air Force barracks from World War II vintage—that was in early 1962—and turned it into a Photographic Service Laboratory. I worked with Procurement and they came up with an off-site

contractor to handle a limited amount of photographic services that we would need. This put us in business while our laboratory was under construction.

In May 1962, the wives of men who worked with the Space Task Group came to Houston on an orientation visit and to look the area over and select future home sites. Some found home sites and others did not, and, along with their husbands, they did not settle in the Houston area; they returned to Langley. You really have to give these wives a lot of credit to stand by their husbands while they worked long hours, did a lot of traveling, and, don't forget, the year 1962, the temperature, for many, many weeks was above 100 degrees, with high humidity and very little air conditioning. I don't know if you were around at that time or not. I still feel that all the ladies should have received some type of a special medal for their NASA involvement and standing by their husbands during this time.

New buildings were being completed and another task is added to the laboratory. Mission control, where all the flights are monitored, had a requirement for precision glass slides. These are used by flight controllers to track each activity during a mission, another large task.

Building 8, the projected home for the Photographic Division, is progressing well. I go to that building site on a regular basis to check the layout, and don't forget the chemical, the water, and the pollution lines that are needed for the photographic operation. Equipment that has been ordered is being installed in the still and motion picture laboratory, and tests are under way to have our building operational as soon as possible.

Another group of astronauts came aboard. These eleven men were called the Apollo astronauts. Portraits were needed of each man, and I drew the straw to accomplish the task. Our building was not complete for a studio, so we set up a studio in the Canada Dry Building on the Gulf Freeway. This was my first experience to work with the Apollo astronauts on a one-to-one

basis. These men were great to work with, and they respected me as a professional, and it made my day. Men like [Edward H.] White [II], [Neil A.] Armstrong, [Virgil I. "Gus"] Grissom, [Michael] Collins, [Eugene A.] Cernan, [Alan B.] Shepard [Jr.], to name a few.

The Gemini Program was under way, with the first mission scheduled March 1965. Astronauts John [W.] Young and Gus Grissom were programmed to test all the systems on that spacecraft. Everything went well, and that paved the way for Ed White's walk in space on Gemini IV. The first walk in space was in storybook form. To see Ed White's walk in space was just unbelievable. When the film arrived in the laboratory, all technicians were highly trained to process this one-of-a-kind material. All safety precautions were exercised. Example: we had auxiliary generators, and our people had been going over simulations many, many times. All systems were go. A number of hours passed and my lead supervisor came to me and said, "We made it. The film looks great." My thoughts go to the hours my people had devoted in training in making this mission one of the greatest toward landing a man on the Moon.

A few hours later, the first showing was scheduled in the motion picture area and we were ready for viewing. Dr. [Robert R.] Gilruth and George [M.] Low came to the laboratory to view the film. They were excited and overwhelmed to see such pictures as this, with Ed White floating around in space. Dr. Gilruth and George Low looked at me and gave me a big friendly smile that was worth every bit of the stress and concern that I had gone through. After the film viewing, I was happy to say, "We've arrived, I hope," and I gave the credit to my technicians, who worked hard to make this happen.

After Ed White's walk in space, our work had just begun, with eight missions scheduled for the Gemini Program. An example: we had the first rendezvous of two spacecraft, rendezvous and docking with the Agena vehicle, all types of experiments, medical coverage and so forth.

After each mission, all film was taken and delivered to a special viewing room. Crews from each flight came in and viewed the material. It was just like if you had been on vacation, you wanted to come back and see how your pictures turned out. That's the way these guys were. They were proud men to work with, and they gave our technician special thanks.

We had many managers to come over and view the material and see how the crews made out. The astronauts that were scheduled for future space missions spent many hours viewing film and picking out a land mass and discussing this with our expert, Richard [W.] Underwood. To say if I had a favorite astronaut would not be easy. They were all great to work with. An example, Ed White, John Young, Gene Cernan, [Charles] "Pete" Conrad [Jr.], Wally [Walter M.] Schirra [Jr.], and many, many more.

After the successful Gemini Program, all eyes turned to Apollo. Long hours at NASA seemed to be standard procedure. In my case, with new procedures to be established, purchasing of equipment, training of employees, simulations and so forth, my hours at the Center went from ten to twelve hours a day, seven days a week. Everyone at the Center seemed extremely busy, perfecting their task assignments.

The Apollo 1 prime and backup crew came to the laboratory for official crew pictures. They were dressed in their flight suits and they were ready to take pictures. I took official pictures and the crew wanted some special ones for themselves. In the group picture, they jazzed up the pictures a little bit.

In the pictures of the prime crew, White, Grissom, and [Roger B.] Chaffee, also wanted their picture jazzed up, so we did that to their liking, and they give us a big smile, and the crew left happy, always with a smile and thank you. [Cries] That was the last time I ever saw the prime crew of White, Grissom, and Chaffee. One month later, on January 27, 1967, the prime

crew was at the Cape, conducting flight simulations, when a fire broke out inside their Apollo spacecraft. That Saturday evening, my wife and I were going out to dinner, and this time, I don't know why, I drove around the block, the area, that I lived in. I passed by Gus Grissom's house. He lived on the street next to me. I saw Dr. [Charles A. "Chuck"] Berry, the astronaut doctor, coming out of Grissom's house.

At that time, I told Judy, "That's interesting and unusual. I hope nothing's wrong." Anyway, I had my car radio on, and a few minutes later, the program was interrupted for a special news bulletin. "There's been a fire aboard the Apollo spacecraft at the Cape, and astronauts Gus Grissom, Ed White, Roger Chaffee have been killed." This was a tragedy and a blow to the country and to the world. That was on January 27th, 1967.

Many months passed that required photographic support to the investigating team that was on an around-the-clock basis. We ended up helping to support the problems and also gave support to the news media group.

Over the years, I have been asked, "What do you do to safeguard your original flight film, John? You have flight film from the early days right on up."

Yes, we have a special walk-in film vault, temperature (28 degrees Fahrenheit) and humidity (15%) controlled, that houses all the original flight film from Project Mercury to the Space Shuttle. The vault is located at Johnson Space Center, Building 8, with monitors on the outside of the vault with temperature and humidity gauges. The center's Operations Building has the same gauges as Building 8 and is equipped with an alarm system if a problem occurs. A strict inventory is maintained on the film and only authorized personnel are allowed to withdraw any items. For safety measures, a second identical film storage vault with master copies made from the original flight film is stored at the White Sands Test Facility, Las Cruces, New Mexico.

Months later, the Apollo 7 spacecraft was tested, updated, including many safety improvements, and ready for flight. The Apollo 7 prime crew of Schirra, [Walter] Cunningham, and [Donn F.] Eisele lifted off from the Cape on October [11], 1968, with a successful mission; the Apollo Program was definitely on track again.

Our laboratory had a major responsibility to the Lunar Receiving Laboratory, the LRL, where the Apollo 11 crew would be quarantined for two weeks during a decontamination process. I assigned one of my lead technicians to handle work in the Lunar Receiving Laboratory. All film products that went to the Moon had to be taken out of cameras and downloaded and put in special containers and into an autoclave for decontamination. After this process, the film was taken to the laboratory for processing.

Apollo 9 and 10 missions had no major problems, and they paved the way for Apollo 11, the first lunar landing. What a beautiful launch. At this time we've all worked and prayed that it would be a successful flight. All of our years of work is down to a few minutes. The voice transmission from the crew was breathtaking. The touchdown on the Moon and Armstrong's famous words, "The Eagle has landed," was captured on film, television, and voice recording and passed to the world. The photographic and television coverage was good. The space techniques used in processing Apollo film was outstanding: an astronaut on the Moon; footprints on the lunar surface that will be there for eternity. Another thrill is to see the American flag standing beside the LM [Lunar Module]. It really made you proud to be an American.

The special training we went through paid off and every inch of the still and motion picture film was processed and accounted for. News media requirements to the world were unbelievable, with thousands of feet of motion picture film and still photographs and color

transparencies. Principal investigators, scientists that had different kinds of experiments, added to our workload. Each called for special handling and processing.

The Apollo 12 mission to the Moon, with Conrad, [Richard F.] Dick Gordon [Jr.], and Alan [L.] Bean was successful.

Apollo 13 had a great launch. However, early in the mission, a fuel cell exploded, causing grave danger to the crew. Our support to mission control and the investigating team was on a round-the-clock basis for photographic and laboratory support. The crew returned safely after hours of uncertainty; however, after nine months to correct the Apollo 13 problem, the spacecraft passed all tests and was ready for flight.

Apollo 14 through 17 was without any major problem. The Apollo Program ended with wiser and smarter engineers and technicians, and paved the way for the Skylab Program.

The three Skylab missions generated thousands of feet of film and supplied the scientific community with invaluable information. The demand on the laboratory went on for months, with special requirements to scientists throughout the world. George [W. S.] Abbey was assigned to our laboratory to view and release all the photographic data from the three Skylab missions. Skylab ended in February 1974, after a highly successful program.

ASTP Program; Apollo-Soyuz Test Project. The joint effort between the Russians and the United States to have a rendezvous and docking of two spacecrafts was under way in 1978. The multiple-docking adaptor was designed, fabricated, and tested, requiring still and motion picture and television coverage, a major impact on our laboratory. I worked with a Russian interpreter and a Russian photographic manager on the many film requirements. After many meetings, we finally came up with the products required for the United States and Russia. The

Apollo-Soyuz Test Project flight went exceptionally well and we feel it was a good public relations between the two countries.

Space Shuttle. John Young and [Robert L.] Bob Crippen, in April 1981, were the first astronauts to test all systems on Shuttle. The Space Shuttle passed all requirements with flying colors and we were ready for flight. Many successful missions were flown. For example, Bruce McCandless [II] was the first astronaut to fly in space without a tether. That was a major one.

Hubble [Space] Telescope was placed in orbit. Medical experiments. Photographic coverage of Europe, and the first woman in space, Sally [K.] Ride, who added to the program, and many more requirements.

Space Shuttle *Challenger* launched in January 28th, 1986, on a freezing morning. A few seconds after launch, the Shuttle exploded, killing all seven astronauts. What a blow to the community and to the world. Laboratory support required many, many months to duplicate and study the high-speed camera coverage from around the launch complex, large quantities of still photographs and special tasks as required.

I have something I'd like to read to you. "Manned Space Awareness. A certificate of appreciation to John Holland, in appreciation for your dedication to the critical tasks you performed in support of the Presidential Commission investigating the Space Shuttle *Challenger* accident. Your valuable contribution assisted in identifying the actions required to return the National Space Transportation System to flight status." It was signed by [Dr.] James [C.] Fletcher, NASA Administrator, and Richard [H.] Truly, Assistant Administrator to Space Flight.

I owe a special thanks to so many people—technical, engineers, management, clerical help—who supported me from Project Mercury through Space Shuttle, and on my retirement from NASA in December 31, 1991.

I know Space Shuttle is grounded now, 2004. However, I am sure it will be operational soon, with an updated spacecraft and more missions, and pave the way back to the Moon and to beyond.

In my time with the government, I always wanted a challenge, and I had a great one with NASA. In my long history, I have gone from one project to another, each one a challenge. My time with NASA has been the greatest experience that one person could ever have. I've had days that were all smiles, and many days I had tears in my eyes. What a great facility, and to the people who made it great.

JOHNSON: If you don't mind, I have a few questions. Would you like to take a break just for a second before we start?

[PAUSE]

JOHNSON: During your overview, you touched on when you first started at NASA and how Mr. Edmonds is the one that contacted you and you'd known him before that. Were you in the Navy before that, as a photographer?

HOLLAND: No, I was not in the Navy as a photographer; I was a flyboy—navigator and gunner on a torpedo bomber in the Pacific, flying off a jeep aircraft carrier.

JOHNSON: So you came back to Newport News, Virginia and opened your own studio?

HOLLAND: After my time in the Navy I was accepted at the Southwest Photographic Arts Institute in Dallas, Texas. That is a subsidiary of Southern Methodist University. I studied there for two and one-half years then entered into a partnership and opened a portrait and commercial photographic studio. The gentleman I opened the studio with had been a photographer in the Signal Corp in the Army and had a wealth of experience. The partnership lasted for a number of years until I bought him out.

In 1950 I had an offer to go to the Naval Weapons Station in Yorktown, Virginia as a photographer, which I accepted. I kept the studio going with good help and soon had a call from the Army Transportation Center in Fort Eustis, Virginia as a photographer. I worked there for a number of years then received another call from the Naval Weapons Center asking if I would come back as a Photographic Supervisor. This I accepted.

About five years later I received a call from my friend, Gene Edmonds who wanted to know if I would be interested in coming to work at NASA and joining the space task group and relocating to Houston, Texas. If interested, he would set me up for an interview with John Brinkmann, Division Chief of the new Photographic Division of the Space Task Group in Houston.

JOHNSON: He contacted you to be Chief of the Laboratory Branch?

HOLLAND: No, I was contacted a month later to have an interview with John Brinkmann. The interview went well and I was offered a position to help set up a photographic laboratory that would be second to none in the country with my main task to support the landing of a man on the

Moon project. After a few weeks and sleepless nights, we [Judy, my spouse, and I] decided to accept the position and have never regretted the move to Houston.

JOHNSON: Was working in a laboratory something you were more interested in than taking photographs, etc.?

HOLLAND: Both. I feel that you need a good background in laboratory procedures as well as taking pictures. To have a well rounded knowledge of both departments is to ones advantage.

JOHNSON: When you first started with NASA, were they taking cameras into space when John Glenn flew?

HOLLAND: John Glenn had a small hand held camera with him and took a few pictures of the Earth using color film. The short duration of flight restricted his time to concentrate on photography.

JOHNSON: Were they starting out with just black and white or did they use color film that early?

HOLLAND: Color transparency film was used on an unmanned flight, MA-1, in July 1960 for engineering study; cameras mounted inside spacecraft used black and white film for instrument panel documentation. Color transparency film was used throughout the Mercury, Gemini and Apollo programs and black and white film was used mostly for special tasks.

JOHNSON: You were talking about equipment and the Hasselblad camera. Was the camera specially designed for astronauts to use on missions?

HOLLAND: The Hasselblad camera was well designed and met NASA's requirements for flight. The Hasselblad camera was modified many times from the time it started flying during the early Gemini Program in 1965. Each camera was definitely improved along the line with a variety of lens, larger film magazines and ease of handling. The astronauts relied on the operation and reliability of the Hasselblad through the Apollo and Space Shuttle Program.

JOHNSON: And the film also? Was it special?

HOLLAND: Yes, the film was a special order from Eastman Kodak. The film that you purchase from a local camera shop is about 5 to 7 millimeters thickness. The film Kodak specially made for NASA was 2.5 millimeter thickness or about like cellophane. The reason for the requirement is the limited storage space in the spacecraft, the film weight and the film capacity on a roll which is increased about 40% by using thinner film. This type of film was used on the 16, 35 and 70 mm cameras on all missions from Gemini through Space Shuttle.

JOHNSON: When astronauts first started taking cameras in flight, did they go through special training?

HOLLAND: Yes, there is a section at the Center that handles astronaut training. Our laboratory has a good working relationship with the training section.

JOHNSON: Since the thin film is a different type, did it require a different processor or special handling?

HOLLAND: The thin base film developed by Kodak is on Mylar base. It is very strong; it's tough and can cause problems during processing. Our technicians are specially trained in handling this material. All thin-base film that we use is processed in-house and not sent off site. Our processors did not require modifications to handle the thin base film. Our technicians and special film handling was the key to our success.

JOHNSON: Was this something that was developed for NASA?

HOLLAND: Yes, it was developed for NASA in the color coded Mylar base film emulsion that was requested.

JOHNSON: So there was not that thin base film before you needed it?

HOLLAND: Yes, there was a thin base film used by the Department of Defense on special tasks.
[Not released on the open market.]

JOHNSON: You had special techniques as far as processing thin-base film?

HOLLAND: There was not any difference as far as chemicals were concerned - it was the same chemistry. One main concern in processing this type film would be in the tracking of the material through the processor and keeping the film aligned.

JOHNSON: Any resistance when you first started with NASA as far as putting cameras on board with the astronauts?

HOLLAND: In the early days of space flight I have heard that there was some resistance in taking cameras on board during flight. This was soon dropped and I never heard any more about it. Wally Schirra, during the Mercury program in 1962, took his own Hasselblad camera on board. It was modified for flight. He took photographs that were good and it helped pave the way for the Hasselblad camera.

JOHNSON: A couple of other photographers mentioned that the astronauts enjoyed taking pictures and wanted to bring back the best photos possible?

HOLLAND: I feel that the astronauts enjoyed taking pictures in flight. When they would view the pictures after flight some had more photo coverage than others. This restricted them during press conferences, by not having as much material to show from the flight. I feel that it started a friendly competition between crews—on trying to take the best pictures they could [such as those covering Earth, crew pictures during flight and Moon walks on the lunar surface].

JOHNSON: How did the Russian photography compare to the ones we were taking?

HOLLAND: They did a fair job in the early stages of the program. As the program progressed, and with newer cameras and training, the quality of their finished product was much improved.

JOHNSON: In a lab there are so many variables when you're developing film as far as the amount of light and the chemicals, and the astronauts were coming back with photographs from space, which no one had ever taken photographs of before, and then later on, the Moon. How did you determine in the lab the correct exposures to make sure that the colors were as true as possible to what they really were taking the photos of, since you had nothing to compare it with?

HOLLAND: To come up with the correct exposure and to produce prints with the color film used, the solution was the use of color transparency film. By exposing the film normal and processing the film normal one can view the original transparency and come up with an acceptable product. In viewing some of the pictures taken on the lunar surface you will notice Kodak color control patch and grayscale placed on the lunar soil before a picture was taken.

This was another way of coming up with a correct exposure when printing a subject and for correct balance. This was done during the Apollo Moon landings. If you know that some pictures taken in the middle of a roll of Hasselblad film were over exposed or under exposed you process the entire roll in the normal mode then inspect the film and select the frames that require special printing techniques. This can be done and possibly save the images of interest. On Apollo 8 that circled the Moon and did not land, pictures taken using Ektachrome color transparency film with a normal exposure and processed normal were excellent. This answered a lot of questions and proved to us that the correct film was used.

JOHNSON: When film came back from Apollo 11 you mentioned you had to decontaminate it in case something was wrong with it. How was the process developed to decontaminate the film?

HOLLAND: A procedure was established at a high level that all material and astronauts returning from the Moon would go in the Lunar Receiving Laboratory under careful medical observation until 21 days had passed from the time the crew lifted off the lunar surface. Any item drawn from the LRL sooner would have to go through a decontamination process. Crew Systems Division established a process that items leaving the LRL early would go through an autoclave exposed to a dry gas vapor designed to decontaminate the film and other products as required. This procedure worked with no problems.

JOHNSON: You showed us a picture of the film vault that housed the original film. When film was developed, were prints made from those negatives or did you create some masters to print from?

HOLLAND: From the original film, duplicate masters were produced and the original film secured. We tried not to use the original film unless special requirements were needed.. From the masters, screening prints were made for the Public Affairs Office to view and select views for news releases. Duplicate negatives were made and used for printing; for example 8x10 color pictures or larger, color transparencies, slides, etc. Much of the same procedure is used when processing and duplicating motion picture film.

JOHNSON: Who developed the first prints from the Moon? Was it just your group that worked together and did it?

HOLLAND: All of the original film that went to the Moon was brought back to Building 8 at JSC and processed, duplicated and printed. Requirements from Public Affairs were met and the final products sent to the world. The technicians working for me were highly trained and skilled professionals. During the entire Apollo program with missions going to the Moon, my technicians never lost a single foot of imagery.

JOHNSON: After prints were made the public wanted to see the results. Was it your group that decided what prints go to Public Affairs to be distributed?

HOLLAND: After screening prints were produced, Public Affairs viewed the film and made **the** final selections for release to the world. During mission time, Public Affairs is on a standby mode to view flight material. Large quantities of prints, transparencies and motion picture footage is printed on a rush basis for distribution.

JOHNSON: What type of process was used to identify the photos once they came back?

HOLLAND: We have two people assigned to our facility that are experts in geography and location of landmass. These people identify each frame of film exposed in the still camera. This caption materiel goes with the final product to Public Affairs for identification with the caption printed on the back of each photograph.

JOHNSON: What was your area of responsibility for motion picture processing?

HOLLAND: My area was responsible for motion picture processing including all on board photography, engineering tests throughout the Center using high speed cameras, processing and duplication of documentary photography and other requirements of the Center for Motion picture requests. Motion picture coverage of launches is the responsibility of Cape Kennedy.

JOHNSON: What type of cameras did the astronauts take with them in Mercury, Gemini and Apollo?

HOLLAND: Cameras used during missions include the Maurer [data acquisition]; Milliken; modified Hasselblad; 35mm Nikon 500; Zeiss Contanex 35mm; and McDonnell 16mm cameras. These cameras used thin base film developed the same way as other on-board cameras. The thin base 16mm film used on the motion picture cameras increased the film load from 100 feet to approximately 140 feet.

JOHNSON: During Skylab you mentioned there were thousands of feet of film exposed. Was there any concern about radiation or that sort of thing?

HOLLAND: A special film vault was designed to handle all on-board flight film to reduce possible radiation. Radiation was noticed on some of the film, which reduced the brilliant

image; however, all the frames of the film were useable and no major problems were encountered.

JOHNSON: Between ASTP and the Shuttle Program there was a period of time. What did your office do during that time period?

HOLLAND: The laboratory was responsible for printing thousands of color and black and white prints, slides, and viewgraphs required to be printed from past missions. Processing and duplication of all Earth Resources Aircraft photography. Providing rectification of images for mosaics in production of maps. Responsible for color infrared Ektachrome processing of Earth looking photography using film 8 inches in width and 200 feet or longer in length, copy work of all sizes and precision slides used in Mission Control by Flight Controllers. Anything photographic ended up in our laboratory. In the meantime, my duties included staff meetings on equipment needs, status of laboratory personnel, budget requests, weekly and monthly reporting, contractor in-house reports and training of personnel to name just a few things. I also delegated authority to my supervisors, however on the bottom line, "the buck stops here!"

JOHNSON: With the beginning the Shuttle Program how did this affect your lab?

HOLLAND: To go from one program to another, especially the Apollo Program, we planed to update some of our processors and printers to keep current in the photographic field. By keeping our facility up to date, I feel we were in good position to go from the Gemini to Apollo program

without too much change in our equipment, etc. However with a new program I looked for new requirements that would be coming in.

JOHNSON: Were you involved in approach and landing tests of the Shuttle or any photography with that?

HOLLAND: That sounds like an Edwards Air Force Base [California] requirement. Although during mission time when the Shuttle lands at Edwards, we do send photographers to cover the event and process and print this material as required.

JOHNSON: You started with the John Glenn recovery. What other missions did you support or travel to?

HOLLAND: Other than John Glenn's recovery, I did help cover the [L.] Gordon Cooper [Jr.] recovery on MA9. My travel on missions came to a stop with the new buildings under construction, laboratory in the works, the hiring of new technicians, new product briefings by vendors and monitoring equipment under construction at various manufacturing sites.

JOHNSON: How many people did you have working during this time period?

HOLLAND: During Apollo, I had 140 people in the laboratory—this was a two shift operation. When I inherited the television branch, the number of personnel for both areas was about 200 to 225.

JOHNSON: At what time did television come in?

HOLLAND: Television started on a limited basis during the latter part of the Mercury or early Gemini Programs, about 1964. Taft Broadcasting Company from Houston aided us in the startup and later were our prime contractor for television.

JOHNSON: In 1977 your position changed. You became Chief of the Photographic Processing and AV Services Branch. Did your job change?

HOLLAND: Other than assuming more responsibility the overall job did not change noticeably. I still kept a hand on mission requirements.

JOHNSON: Once the Shuttle Program started were they taking the camera and bringing the film back to your laboratory or was it during your career that digital technology came in?

HOLLAND: During the beginning of the Space Shuttle Program all film returned for processing was handled in the same way as during the Mercury, Gemini and Apollo Programs. Digital technology was not introduced until I retired from NASA.

JOHNSON: What memories stand out during your time at NASA?

HOLLAND: There are many memories that I will always look back on from my years at NASA; many happy memories, some sad. Some include Ed White's walk in space; the first rendezvous

of the spacecraft in the Gemini Program; the loss of Apollo 1 astronauts, White, Grissom and Chaffee; fire on the pad at the Cape; the Earth-rise taken on Apollo 8; and the Scripture reading on Christmas Eve; astronaut by the flag on the Moon, Apollo 11; footprints on the Moon, Apollo 11; views of the LM [Lunar Module] lander on the Moon with astronaut, experiment packages, footprints and flag (a classic!); picture of the Earth taken about 25,000 miles from re-entry, Apollo 17; Challenger Accident and loss of crew;-returning the boxes of lunar rocks from the Moon to the Lunar Receiving Laboratory; and in general memories of processing all film that was taken on the Moon.

ROSS-NAZZAL: I have just sort of a fun question for you. You mentioned that Wally Schirra was your neighbor and you also mentioned Pete Conrad lived in the neighborhood. What was it like living in this neighborhood with all these astronauts around?

HOLLAND: Living in a neighborhood with Grissom, Glenn, [M. Scott] Carpenter, [James A.] Lovell, [Elliot M.] See [Jr.] and later [Michael J.] Smith, [Karol J.] Bobko, [Robert C.] Springer and [Jerome "Jay"] Apt there was never a dull moment—tour buses coming by our house on a regular basis, guys yelling out "Where are the astronauts?" One kid at the entrance to Timbercove was selling hand made maps showing where the astronauts lived with street addresses. On one of Conrad's flights, the news media men asked one of four Conrad boys if he would ride his bicycle off the roof of their house and land in the swimming pool close by! I understand he made it okay to the pool but I don't know what his reward was from the media!.

Judy and I went a lot of places to look for a home site when we first came to Houston. We selected a lot and started to build in Timbercove. I received a lot of ribbing on our lot

selection. Many guys said; "Holland, why in the hell are you coming into the area where the astronauts are?" My answer: "Nope, we came to this area first—they came to the area where we were!" And that's the truth!

WRIGHT: I have a question about Apollo 11. When the canisters returned with the film and before you brought them to decontaminate them, you said you assigned a technician to handle all that. Was there any hesitancy from the persons that you assigned to work with this film? After all, that's the first time that we ever encountered Moon dust. Did anybody have any hesitation of wanting to work with the LRL and that film?

HOLLAND: I asked Terry [N.] Slezak, an excellent technician, if he would like to go in the LRL to accomplish the decontamination of all the film that returned from the Moon and help out in other areas as needed. Terry jumped at the chance, a gung-ho guy for the program. "Let's get it done!". Terry did another excellent job for NASA.

JOHNSON: What was your biggest challenge during your career with NASA?

HOLLAND: One major challenge in my career was to be a part of the development of the photographic laboratory and see that all equipment was procured, installed and operational to support the Apollo program for the first manned landing on the Moon. We did have a laboratory that was second to none in the country; however, I felt personal responsibility for this phase in the Apollo Program.

JOHNSON: Is there one moment or instant that you are most proud of?

HOLLAND: During my time at NASA and after processing all the Apollo 11 film taken on the Moon and to see the color images displayed on a light table gave me "goose bumps"—an astronaut on the Moon beside the American flag and footprints on the lunar surface that will be there for eternity! I was proud that I had a special part in history!

WRIGHT: Would you just share with us your thoughts the first time that you saw pictures of the Moon? You said Apollo 8 was the first, those first shots that they took. Can you just give us your thoughts of what it was like to see—to know that you had still photos—that they had taken pictures of the Moon?

HOLLAND: To see pictures of the Earth rise coming into view as the Apollo 8 crew circled the Moon, it gives me a feeling of peace, a different perspective; a picture of the Earth rise and lunar surface that not even the most accomplished artist could reproduce.

JOHNSON: Do you have a favorite photograph from during your time that you were there? Do you have any one that you could name as your favorite?

HOLLAND: My favorite picture of the entire Apollo project would be the LM on the Moon, an astronaut by an experiment package, footprints on the lunar surface that will be there for eternity and the American flag. This tells the full story, in my opinion, of Apollo. We came. We saw. We accomplished our mission. And we returned to Earth!

[End of interview]