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[full name of interviewee]

about Ship for testing Space Craft
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1968 Operational Test Branch, Landing & Recovery Div,
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Master 1

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

Education - _____

Career Path - 1961 Transportation, Langley

Dec. 1962 - Landing & Recovery

Topics - Transportation logistics for Houston more; ^{test activities} watercraft;

"Retriever"-LCU class vessel purchased from Army;
Bender ^{Shipyard} (Company) in Mobile made modifications;
for spacecraft retrieval; ¹⁹⁶³ berth at Seabrook
Shipyard; 48 hr ^{loaded} spacecraft ^{sea} flotation tests;
environmental test Chamber; ~~tests~~; ^{capsule} ~~flowing tests~~ ^{spacecraft};
~~test~~ dye tests; egress training (collar device
and "Billy Pugh" net; Gulf of Mexico for deep water
tests; Catering arrangements for overnight trips;
~~crew~~ accommodations; maneuvering Retriever;
problems and additional modifications;
Smaller Auxiliary Craft.

INTERVIEW WITH FRANK M. GAMMON
May 24, 1968 and July 14, 1968

The person responsible for my being with MSC is Joe ~~C~~^Kreske. I was working at Cheatham Annex and Kreske was working in the same office across the desk from me and apparently his wife was with the Mercury Program at Langley. I had hardly heard about the space program at that point and he told me what it was all about. Through his wife, I found out who the transportation officer was (Ed Johnson), set up an appointment with him, and after an interview he and his assistant, Charlie Griffin, offered me a position.

154 I transferred over effective in October 1961. During my military career I had been motor transportation officer in addition to being a supply officer, and they put me in charge of the motor pool. I was also put in charge of flight accommodations on the charter aircraft. I prepared the manifest of passengers and cargo, and made arrangements for people arriving and departing to have transportation to and from the air field. I was also responsible for seeing that baggage got where it was supposed to go.

154 I had some interesting experiences in this job. [Jim Chamberlin came in one night on one of our charter aircraft in a pouring down rain. We'd called his wife in accordance with his instructions, and she was on her way there to get him, and he left. He forgot his baggage, and apparently forgot his wife was coming. She looked all over for him and was upset that she was there in the rain and her husband wasn't to be found. I'll bet he remembered the next time.]

We had quite a problem at times with people coming in from Patrick

AFB and wanting to have cars assigned to them. Mr. Harrington was the hardest to please along those lines for he wouldn't accept a taxi, he didn't want to share a car with anyone else. He always insisted that he have a separate car. We had quite a time keeping him supplied with automobiles.

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155 Just before we came to Houston a shuttle flight from Langley to Huntsville to Houston was inaugurated. It gave all MSC employees an opportunity to come to Houston beforehand without transportation expense to see if they could locate housing. That was a very popular, fringe benefit, and it was extremely useful.

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151 I came in July. I think the first two weeks of that month it was 104° every day. About that time, Jack Bishop was hired as assistant transportation officer. Jack assisted Charlie Griffin in the moving of the household goods from Langley to Houston. Griffin finally came down on this end to receive it and Bishop was arranging most of the shipments from there. [Bishop bought a house and Griffin and his wife lived in it before Bishop brought his family to Texas. Bishop had a dog, and in the short time he was in the area the dog picked up ticks and brought them into the garage and the ticks then found their way into the house itself. Griffin told me that before his family could go to bed that night they had to call in an exterminator to come kill the ticks in the house. That didn't help them appreciate Texas, and what with the heat and other things they finally moved back to Virginia.]

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The move was completed about July or August 1962, as far as our office was concerned. I worked in the transportation office here in charge of motor vehicles until about September 1962. One day I say some correspon-

266 dence come through the office requesting the purchase of a watercraft to support test activities of the Center. I was immediately interested, having been associated with the sea during my military career and for a short period of civilian life in the 30's. I talked to the people who initiated the request. They had requested a LCM type vessel which is very small and I felt that for what they were proposing to do with it, that it wouldn't meet their needs, and even after they made all the modifications to the thing that they were planning it still wouldn't have the room they needed. I suggested a LCU type vessel.

266 After being interviewed by Pete Armitage I was hired as master of this vessel. I have a Master's Ocean License and had sailed this particular type of vessel for a short while before retiring from the Army. I transferred to Landing and Recovery Division in December 1962 and immediately began negotiations with the Army Material Command in St. Louis, for this type of craft. I made several trips with Mr. E. Z. ^a Herrin to St. Louis and also to Charleston, S. Carolina to look at vessels that were offered. There were several in "wet storage" there. We selected one and after negotiating a loan agreement with the Army, we accepted the craft. I signed for it ~~in February 1963~~ ^{through the intercoastal canal} and the Army delivered the vessel from Charleston ^{on Feb. 5, 1963.} to New Orleans with an Army crew. I rode along as property custodian. At New Orleans it was turned over to us and sent a civilian tug to take it back to Mobile for modifications. (A shipyard in Mobile had successfully bid on modifications to it.) Ross Dearing was hired as chief engineer in May 1963 while the vessel was in Mobile.

266 The vessel selected was in the LCU class (the Army designated it as a 1466 class vessel). It's 115' overall length, and 34' beam. It was

designed to accommodate six 30 ton tanks or 200 combat troops on its main deck. It had a big anchor on the stern, and the normal use of the vessel was to offload ships at sea that couldn't get into the ports. It would then run into shore, drop its anchor about 1200' off shore and then run onto the beach. It has a flat bottom, three main engines, three propellers and a rudder. It can carry a crew of 14, has a galley and can sustain itself for seven days at sea. It has a cruising range of about 700 miles and is equipped with two 20 KW DC generators.

266 The reason this was picked up from Charleston was because it was the Army's wet storage basin for all surplus craft on the East Coast. We had looked into the feasibility of using a civilian crew to bring it around or have it towed to New Orleans, but the cost of either was prohibitive. The Army said they would furnish the crew and move it for \$2500.

266 We were supposed to have gotten a new one; however, when we got to Charleston to get it, the commanding officer told us that the command general in the European Command had requested a LCU and he had given him the one we were supposed to get. I guess he felt NASA would be easier to get along with than someone who might be his future commanding general. We got one that wasn't in the best of shape, and we are still bothered by many of things that were wrong with it. We had all the spare parts on-board that are normally shipped with such a vessel. It carried fenders for use when battleships were transloaded and since we had no need for them, we had to dispose of them. The trip from Charleston to New Orleans was through the intercoastal waterway, and we stopped wherever the army skipper felt like stopping. Some days we would make 30 miles and some days 100, depending on what port he wanted to make and who he knew when

he got there. It took us over two weeks to make the trip. We came through Lake Oke^{ch}chobee across the Gulf to Panama City, from Ft. Meyers to St. Petersburg and on into New Orleans. The Army turned it over to NASA at that point, its crew departed, and we locked the ship up. After the contract was let with Bender Shipyard in Mobile, the Army did take everything off the vessel and stored it for NASA in the Army terminal at New Orleans. Bender sent a tug over, in accordance with the terms of the contract. They agreed to take delivery in New Orleans, move it back to Mobile, make modifications and redeliver the vessel to the Army terminal in New Orleans.

During the vessel's stay in Mobile, Bender installed davits and mounted a travelling crane on the poop deck (the next deck up from the main deck). The anchor windlass and allied equipment was removed along with the anchor. The whole area on this deck was made to resemble the stern of a destroyer as much as possible. Two large rails were emplaced as I beams for track and a davit mounted on it that would travel over to one side of the ship, lower a hook by use of cables and windlass and as the ship came up to the spacecraft, hook it, pick it up, bring it up into a yoke, lift it clear of the deck, traverse across the deck and set it down. This was the first method used for spacecraft recovery other than a boom. The bulwarks on the sides of the main deck were cut away and portable rails installed so they could be removed and we could work off the main deck unhampered. A 50' mast and a 40', 10-ton boom, were installed on maindeck for handling the spacecraft. On the poopdeck a different type of davit was installed so that alternate arrangements could be tried out as we were not sure which method ^{was best suited for spacecraft recovery.} ~~the Navy would accept.~~ We also added two new rooms forward of the main house: one to house the radio equipment

and the other to house two 45 KW AC diesel powered generators. All the fuel lines were relocated and lowered, and the poopdeck anchor gear was removed. It came with a 1,000 pound anchor hanging over the stern and with 1200' of one inch cable on a drum. In beach landings, they dropped anchor, ran on the beach, and then pulled themselves off the beach with it. On the top of the pilot house, in a plywood type structure, Bender installed a second set of air controls for the engine. We also had an electric steering installed on the flying bridge and the ship was air conditioned with a ten ton unit installed in this machinery room. These were the main alterations we had made to the craft.

Upon completion of repairs, Mr. Dearing and I checked the ship with aid of an Army marine inspector. Bender delivered the vessel back to New Orleans ^{on June 10, 1963} and I came back to MSC to ^{assist in negotiating} ~~negotiate~~ a contract with the Seabrook Shipyard to berth the vessel locally and furnish fuel, supplies, etc. I was appointed a contracting officer's representative and later contracting officer for the purpose of making purchases for repairs, parts, and supplies for the vessel and in dealing with the shipyard. The contract covered furnishing a crew as needed for the craft so we laid down a requirement for a mate, an engineer, three deckhands, and a cook to go over to New Orleans and bring the vessel back to Seabrook. ~~June 1963~~, ^{on June 13, 1963} we took delivery in New Orleans, loaded the supplies onboard and set off for Seabrook by way of the intercoastal canal. We arrived ~~the same month~~. ^{June 16, 1963} Just the engineer and I were permanent crew members. I had the authority to hire people from the shipyard for maintenance as needed. However, we seldom needed more than a deckhand and an engineer, because we were assisted in linehandling and docking by Tech Services Division personnel. That

division furnished riggers to handle the spacecraft during tests, and we used to a certain degree for tying up, depending upon the weather conditions.

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The mission of the Retriever is to participate in the test program of the Center. We covered air drops in Trinity Bay, which included testing of retrorockets, parasails, egress training, sea dye tests, beacon tests, and a final checkout of all systems onboard the 007 spacecraft to ensure that it was operational. We also had tests of radios, flashing

were carried out in the Gulf of Mexico.

lights, para-rescue operations (both at night and in the daytime), and methods of dropping flotation gear. (One method was to drop a line downwind from the spacecraft so the wind and current would carry the spacecraft over it, and ~~the other was a system of grappling hooks~~ ^{included grappling hook}. The crew would poke a grappling hook out of the spacecraft to snag the line and the two recovery packages that had been dropped. These packages also included flotation gear and other equipment allied to the operation. The para-rescue team would also then parachute in and put the flotation gear and ~~things~~ on the spacecraft. The idea of this line in between the two packages was to slow down the drift so the spacecraft wouldn't pass the gear.) We also had uprighting tests which called for putting the spacecraft in an upside down position with tunnel pointing downward. An air compressor inside the spacecraft inflated balloons or flotation gear attached to the spacecraft to upright it. The number of bags normally was three but at times only two were used.

The first Gemini test lasted about 20 minutes. It was scheduled for two days; however, ~~the sea conditions were so bad that the astronauts involved became so seasick that we had to terminate the test.~~ ^{sea systems failures necessitated termination of the test.} ~~On the Apollo~~ ^{Modifications were made to the S/C and the test was completed at a later date}

tests, test subjects in the spacecraft were put overboard with everything they would use in a flight. There they stayed for 48 hours, which was the length of the test. The seas became very rough and got as high as 10-12' with a pretty good wind blowing but the ~~astronauts~~ ^{test personnel} rode it out. On the last 007 test, the seas did not reach the state desired, but the ~~astronauts~~ ^{test personnel} stayed out 48 hours. ~~As we could not attain the humidity and temperatures they were looking for, they concluded the test~~ ^{Additional} ~~in Building 260.~~ ^{were conducted} I believe that test lasted 27 hours and it simulated conditions by placing the space-

a post landing environmental test chamber.
 craft with the test subjects in it in ^{chamber} a water tank. This tank holds approximately 60,000 gallons ^{water} and there are facilities for monitoring the condition of the test subjects. While at sea we maintained radio contact with them, they had sensors on their bodies, etc. Closed circuit TV was used in the tank test and ~~steam and carbon arc lamps to attain the various~~ *post landing humidity, temperature, solar load, wind and 3/4 motion were imposed on the SIC.* degrees of humidity and other conditions desired. At night the air conditioning was turned on. The test turned out to be very successful.

In addition to these, we have run some biological suit tests. The test subjects are put in these new type of suits, put on a raft and exposed to the sun. The Retriever anchors nearby for about four hours while these men are on the raft.

We also did some towing tests on a boilerplate of the Apollo spacecraft. Various stations around the world had boilerplates and they were practicing ~~recovering it~~ *installing a flotation collar on* and they didn't have the facilities for moving the boilerplate out to the test area quickly, or they couldn't pick it up and put it overboard or do what they wanted to do. We prepared a test to establish an effective way of towing the spacecraft. We devised a bridle and determined the best points on the spacecraft to attach it. We also tested a sea anchor device to slow down the drift of the spacecraft. These tests required overnight operation. The durations of most of our tests were of daylight hours only; the majority of them were one day tests. The sea dye tests also were for overnight because we had to get far enough out on station that the spacecraft could drift for 12 hours of daylight, and the aircraft could come over and photograph the density and spread of the dye. Several of the sea anchor tests were incorporated with other tests and we stayed out overnight on them.

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327 The recovery system at the end of these egress trainings requires the astronauts to be picked up by the Coast Guard helicopters. A collar is dropped to the astronaut, who slips his arms through it and then is lifted onboard. A different recovery system has also been tested. It's called the "Billy ~~Pue~~ ^{puke net}" and is a rope net device. It is dropped into the water, the man climbs in it, and when the aircraft picks it up it expands up over him giving the appearance of having him in a cage.

327 We average about 85-90 tests a year. We averaged about nine a month for a while, and on one 007 test a year ago, we were out about five days. However, about three days of that was waiting for the right type of sea condition. I must say the Retriever is about the sorriest fishing boat in the country. We were all over to the snapper banks during this waiting period and no one caught anything but old hard heads and crabs. There are several generators running all the time and maybe the noise from the ship frightens the fish. [I spent about \$100 on fishing gear and I think I have caught two king mackerel with it.]

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766 My engineer, Ed Dearing, stayed with NASA a little less than a year. He was a retired Army Warrant Officer, and the Comptroller Gen made a ruling that no retired officer could work for the Federal Government and draw two paychecks. If they did, they would have to pay the money back to the government. Mr. Dearing became alarmed over that and resigned. He went to work for the G&H Towing Company at Galveston and he is now a port engineer for A&M University. My position as master and that of Mr. Dearing as chief engineer were unique in NASA, as we were scheduled as Wage Marine personnel. After Dearing left we hired a Mr. ~~Janek~~ ^{JANOKH} who is serving as acting Chief Engineer, and is in charge of the engine room.

He doesn't have a chief engineer's license, and he is classified as a WB rather than a WM employee. I have a combination deckhand and engineman who is working toward becoming an assistant engineer, and he also is classified as a wage board employee. A retired Navy Chief Petty Officer, *on William Frank Linscombe* is serving as mate and NASA gave him a WM rating. So there are still only two WM ratings out of the 35,000 employees in NASA--myself and the mate. The WM ratings wages are governed by the maritime industry on the Atlantic and Gulf Coast. Whenever industry rates are increased or decreased the Army and Air Force wage boards make a yearly survey, and adjust WM pay scales accordingly. We are not given raises when the wage board or GS employees are given pay raises. Consequently when promotion dates come around, pay raises, etc., our records sometimes are overlooked.

327 We currently operate primarily in the Gulf as most of our tests have to be conducted in deep water. Another reason is we are looking for water that is as clear as we can get because of the swimmers. The Tech Services Division furnishes the scuba divers who go out and put the flotation gear on and do other type of work around the spacecraft while it is in the water. Galveston Bay is too shallow for most of these tests, we did do a few like the Billy *Pugh* ~~Bue~~ net test in the Bay. We used to use Trinity Bay for our air-drop tests but these have been completed and we rarely go into that area.

327 When we are out overnight, a caterer comes aboard and ~~f~~urnishes us with our meals. I have been classified as a contracting officer and conduct purchases for the vessel out of a fund I am provided. When I need the services of a caterer, if it's more than a \$250 operation, I have to go out and ask for bids and then take the lowest bid. The problem is finding people who can do the type of catering service we need. We have been

fortunate in that we have one man is willing to do most of the catering for us. When I ask for these bids, I ask for the cost per man per day to perform this service and I take the lowest bid on that basis. The caterer brings everything aboard with him that he will need. We furnish the galley facilities and the plates, flatware, and cooking utensils. The caterer furnishes everything else. We have been very fortunate in that the man who has been doing this work has never been seasick, and has never missed serving a meal. Everyone has always been well fed, and well pleased with the services we have received. Breakfast consists of a choice of eggs any style, pancakes, juices and coffee. We haven't been able to carry much milk with us because our refrigeration system is inadequate. Lunches vary, depending on operations. Sometimes they consist of sandwiches. Full meals at lunch are too much in the middle of the day if we are not working. When a meal is served it will be some type of steak, vegetables and a dessert. A variety of soft drinks are available. In the evening there is always a steak, boiled potatoes, vegetables and cake or pie. Midnight snacks are served when we are out overnight.

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The ship was originally designed to accommodate a crew of 14. The master and chief engineer room together. In the crew's compartment there are 12 canvas bottom bunks tiered three high. When we go out on trips we carry extra bunks, and can sleep as many as 24 people by setting up extra bunks down the center isle and putting some in the radio room. The old wheel house has been converted into a bunk room and there are three more canvas bottom bunks in there. Unless it's a 007 ^{type} test or a final phase checkout, we normally take around 20 people, but most of the tests require around 10-12 people. I understand that future tests will require 15 people

on overnight trips.

266 The Retriever has a flat bottom and at times is very difficult to handle especially in adverse weather or if the current is running the direction of travel. The ship has a tendency to slide. It's just like a shoebox sitting on the water and the pilot house that has been added together with the poopdeck serves more or less as a sail. Thus the ship has a tendency to skid or slide around and we have to be very careful in maneuvering when we come up only alongside the dock or when we are making the approaches on the spacecraft at sea. If the vessel comes up to the spacecraft and if the crew doesn't hook onto it on the first pass, and the spacecraft hits the side of the ship, it will then slide away from the side and we start chasing it. A cushion of water keeps pushing it away and we can't get close to the spacecraft. The channel from Seabrook out into Galveston Bay is a very crooked and difficult to navigate. In adverse conditions, if the wind and current are on our stern, it is almost impossible to get through the bridge without riding one side of it. We have to get in the bridge, stop, and try to pull off of it and heat out again, as the channel makes a turn right under the bridge. At times, there have been shrimpers tied up on the other side and there have been some close calls. Once the railroad sued the Government, claiming we broke the guard rail on the railroad bridge. However, at the time they said we did it, the Retriever was in the shipyard at Todds being modified. After making affidavits, getting extracts from the ships log and sending them to Washington to the Department of Justice, the suit was dropped.

266 When the Retriever first arrived it was known as the 1530, its Army designation. Everyone in Landing and Recovery and a lot of people from

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other places submitted names they thought would be appropriate for the name of the vessel. After all names were in, everybody voted for their choice and "Retriever" won. Engines on the Retriever are underpowered for some of the things we have attempted to do. On one occasion, in coming into the Galveston Channel we ran into a squall which had winds up to about 40 knots. The current was running out about three knots and we were stopped dead in our tracks. In fact, we even ~~made~~ ^{way} stern ~~wash~~ for about 40 minutes. All we could do was hold our heads into it. It's also difficult to operate, and to maneuver into current at times.

766 As time went on, the pilot house proved to be far too small for the people necessary to be in there. In 1965, Todd Shipyard performed additional modifications to the vessel. All the controls in the lower wheelhouse were moved to a new pilot house. It has dual controls, one on either side of the pilot house. The radio-controlled davit cranes are operated from this new pilot house. ~~Once the Navy decided what davit it would use,~~ ^{It was determined which crane was more suitable} the tracks were removed from the poopdeck and the davit was installed on the maindeck on the starboard side. There is more room in that area to work with the spacecraft than on the poopdeck. It was about the same height of a destroyer's deck and we wanted to simulate as close as possible the destroyer operation.

766 This vessel has been ideal for the operations in the Bay area. It draws about four and one-half feet of water aft and about three to three and one-half feet forward. If it is ballasted, we can operate anywhere in Galveston Bay. But it is slow, and the accommodations are getting crowded for the tests we conduct, particularly 007.

We had the need for a small auxillary craft to assist in retrieving

the spacecraft, particularly in Trinity Bay for recovering the parachutes on air drops. A 16' turbocraft was purchased. It was operated by jet streams of water. It had a very shallow draft and could go anywhere.

There was no propeller to get fouled in the shroud lines. However it was fiberglass and wasn't rugged enough for the job we used it for. It did perform well in Trinity Bay, however it got badly banged up and was repaired several times. It was finally surveyed and we have never been able to replace it. In the Gulf we need a craft that can get out there fast, but will also serve as a work boat. They are pretty expensive and I think that has been the stumbling block to the purchase of a replacement.