

Anthony D, Vidana  
May 13, 2020.

**I Remember Bldg 290-  
North American Aviation  
Space and Information  
Systems and other Aerospace  
Nuclear Jobs**



Apollo 15 April 1 1968-Anthony D. Vidana

I was transferred from North Long Beach facility to Downey Bldg 290 in July 1 of 1965. Bldg 290 & Parts of Bldg 6 was called Apollo Test & Operation (ATO). I had been working for this NAA Space Division for about a year when this happened. I was an electronic technical employee with 5 years under my belt working for this company-NAA. I wound up working in building 290 High Bay for over a year and interfaced with that facility up until a month before the first moon walk.

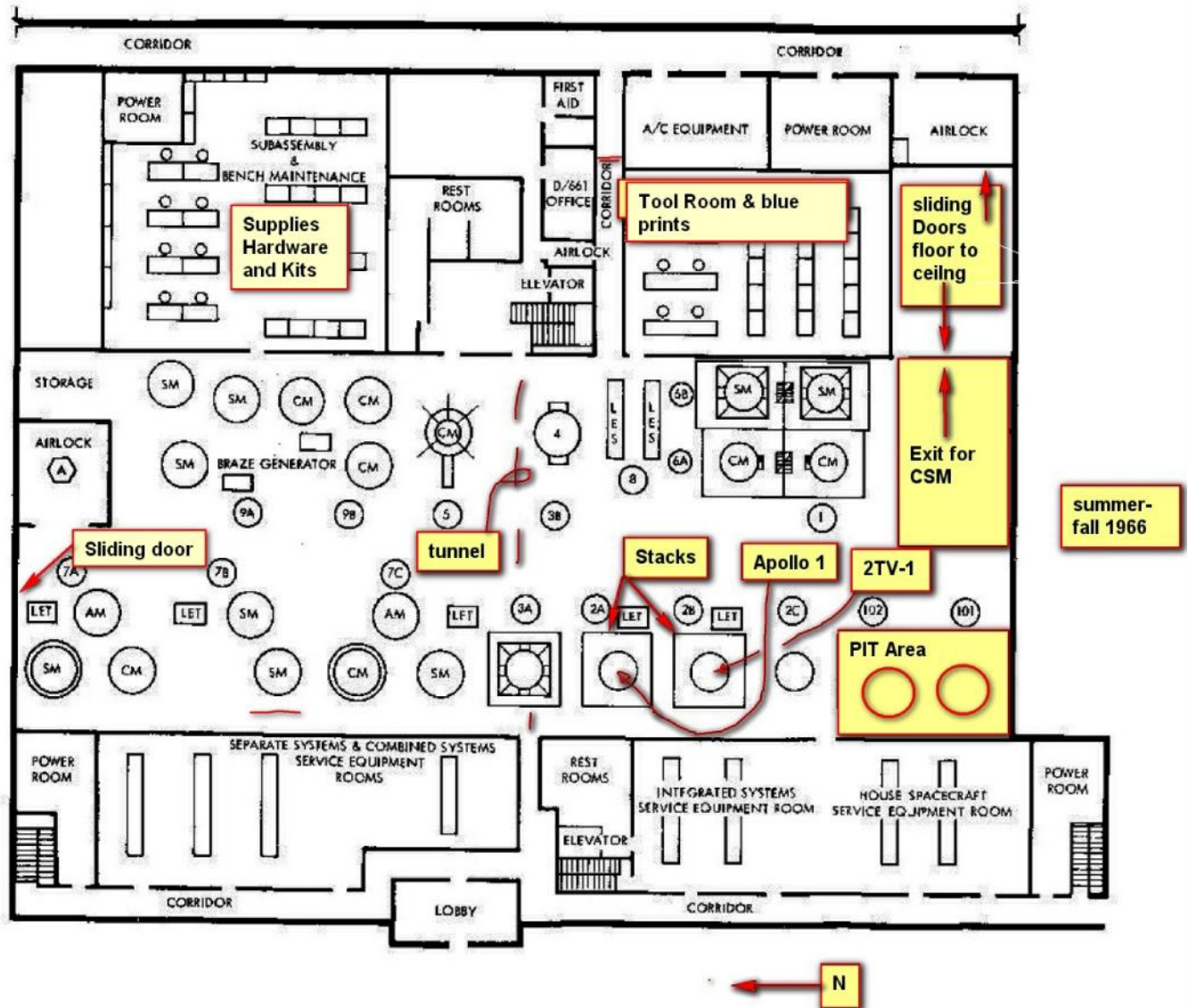
When I first walked into the high bay in bldg. 290 I had the impression that I had entered an area describe by science fiction movies, only the science fiction music was missing. It was really noisy there with a lot of banging and drilling sounds.

The building had a front lobby that was locked all the time. Exterior pedestrian entry was from the north and south side. The building was attached to building 6. There was a hallway between the buildings with an entry from that side of the building to the bldg high bay through the change room and airlock. There was a hallway in opposite side in front of the building with an airlock there too.



The bldg was 133,000 sq ft. It had a second story on both sides of the high bay area. There was a viewing window of the high bay from the second story from hallway there.

The building had a tunnel running under the High bay east to west near the center of the building. The entrance was by the elevator in the front and exit near the east side by the airlock. The tunnel was partially blocked by a dolly with equipment mounted on it that had a radioactive warning sign.



The High bay had a pit on the south west side that ran partially under the two story front section of the building. The west center of the high bay adjacent to the viewing window had two structures that were called stacks for vertical mounting the Apollo command module to the Service module. There were two 15 ton bridges cranes in the 63 feet High Bay and two 10 ton for the 42 feet Low Bay for moving the spacecraft and heavy equipment around. There was a lunar module on the north end of the high bay.

The building had two tall equipment doors floor to ceiling that opened sideways in the high bay. These doors were located on north end and another on the south east corner of the building. The south east corner door was used to exit the Apollo craft in three parts the command module, service module and the escape rocket.

The west side 1<sup>st</sup> floor had some utility rooms on either end of the building. The electrical room was located in the 1<sup>st</sup> floor in the north east corner. The tool and parts room was located adjacent to the 1<sup>st</sup> floor east airlock with a small hallway between them. The parts were given to someone

inside a plastic bag with ID slip inside it. There was a hardware room with screws and etc located on the other end of that same airlock that opened to the high bay area.

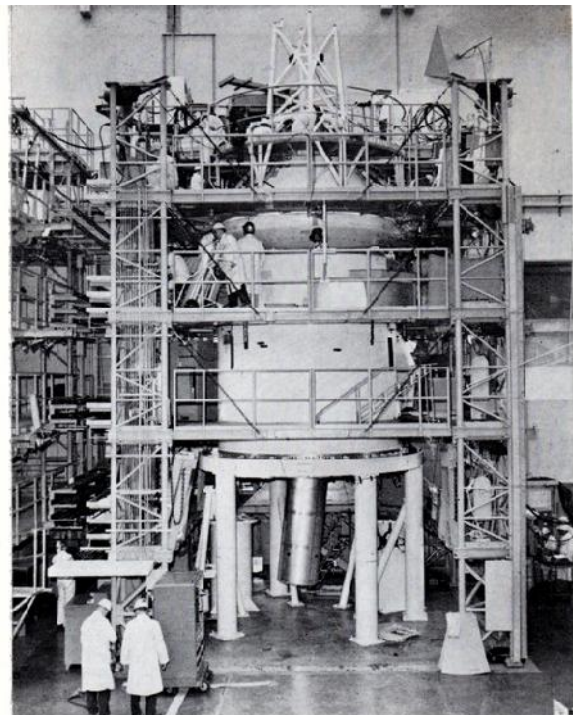
The 2<sup>nd</sup> floor south to north was the location of the Command Center, RF room, Computer room, some conference rooms, War Room, Elevator and offices. There was a mixing room for making super glue and other compounds used on the Apollo located on the east side second floor.

Space craft 009 was finishing off it's testing. The command module (CSM 012-Apollo one) was on the high bay floor mounted on a dolly. Equipment was installed on the inside and outside of the spacecraft in this location. This lasted several months. When that work was completed it was transferred to the stack (Test Stand-Intergraded Checkout Station) using a bridge crane.

Each Stack was several mini stories high. The head clearance walking up its stairway was a little less than six foot and ducking was required to miss hitting the top of a person's head. The stack opened from the front to allow placing the service module in first then the bridge crane was used again to lift the command module on top of the service module. The front of the stack was then closed. After that - cabling and plumbing was connected from the building to the spacecraft. Some minor wiring and other tasks were performed then the intergraded testing could begin. The testing lasted about four months.

### **The Apollo System**

Apollo was a three-part spacecraft: the command module (CM), the crew's quarters and flight control section; the service module (SM) for the propulsion and spacecraft support systems (when together, the two modules are called CSM); and the lunar module (LM), to take two of the crew to the lunar surface, support them on the Moon, and return them to the CSM in lunar orbit. There was also an escape rocket that could be used during lift off.



**FLIGHT SPACECRAFT** — Apollo Spacecraft 009 undergoes mission simulation and systems integration checkout in Bldg. 290 clean room before being delivered to NASA on Wednesday.

The flight mode, lunar orbit rendezvous, was selected in 1962. The boosters for the program were the Saturn IB for Earth orbit flights and the Saturn V for lunar flights.

I worked in the Command and Service Modules of the Apollo stack (test stand). We had almost 30,000 people in Downey working around the clock to make all the pieces come together. But only 3 people could work inside the command at a time and I was one of the three- Me the inspector and the astronaut.

Building 290 two stories high Test Bay was the largest clean room in the world. When I first walked in this test bay it was impressive. I noticed that the building Clean Room had large



hanger type doors adjacent to the far end of both walls. There was a row of columns in the center running the length of the building and rows of test stands on the west side. The Test Bay had large tilted observation windows facing the test bay from the observation room.

The clean room had vertical test stands lined up in a row with two bridge cranes over head that ran the length of the building. Later on more test stand were added to the clean room. Each test stand had an Apollo Command Module with its rocket section called a Service Module in each of them. The Apollo Commands and service modules were attached and mounted vertically in the test stand. The test stand had stairs, guard rails and work platforms on three levels and a base floor level area so we could easily work on the Bird at each level. The photo is a picture of my test stand with Apollo 1 Space Craft CSM 012. Whoever designed these test stands did a good job because it was safe and easy to work on these birds from the test stands and no one ever fell from the test stands either. The only



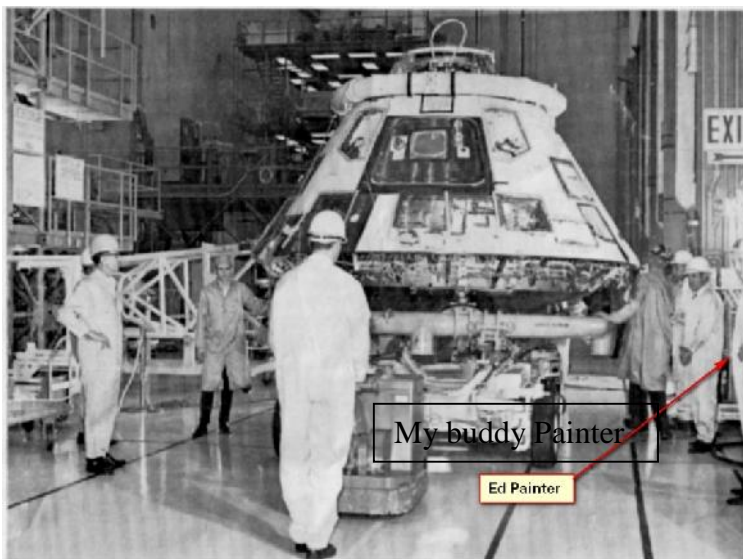
problem we had with the test stand was bumping our heads climbing the stairs. That is one of the reasons we all needed and were required to wear hard hats.

Lifting Command Module to stack Sta 2A

We were also required to wear nylon coveralls and caps that were clean room quality and were changed frequently. White coverall's were worn by technicians and gray for the astronauts. Blue coverall's were worn by inspectors. Engineers, leads, management and guests wore nylon coats of various colors instead of coverall's. We had to bush our shoes on a shoe bushing machine before entering the test bay. It was all new and exciting working there. Inside the command module we didn't wear hard hats-just the nylon caps.

**Work Conditions:** Then the reality of hell began. Work was hard on the guys because of the long shifts we were working. We would get up and go to work then come home and go to bed. There was not much time in between. I was on second shift. We would start at 4:00 pm and work until the next morning at 4:00 AM or 6:00 AM then sleep in between. I was lucky I lived close by so travel time was short. This happened every day without a day off seven days a week. The guys there were having a rough time with their work schedules. They had heart attacks or their wife's were having nervous break downs or they were being divorced by their wife's. Post Traumatic Stress Disorder (PTSD) was starting to set in.

At first very one was drinking at our evening lunch break. Even the Astronaut would join us. We had a haft hour for lunch. We would make a fast trip to a local bar that served food and drink there. That got old quick so we just brown bagged it and played cards during lunch break. Drinking beer just made the night drag on and would make you sleepier.



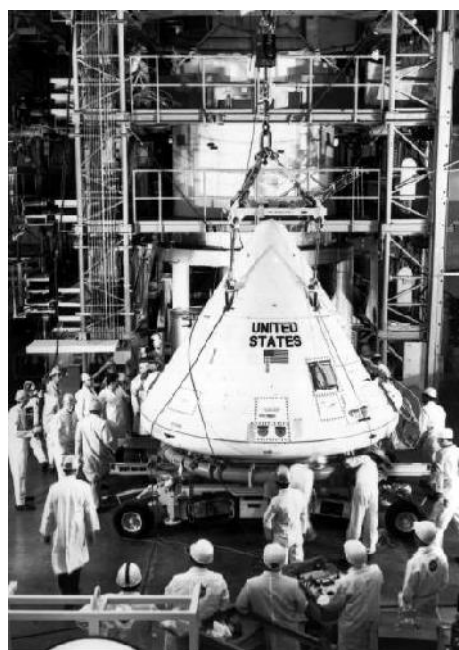
CSM 101 1967 Apollo 7 in bldg 290

Our technician crew had no company or planned on the job training on the Apollo systems. We just learn as we did the work. The Spacecraft's would come incomplete and needed some final assembly. We had a guide card that was detailed for each project listing the exact tools, parts and blueprints required to do a specific job. The screw head (bolts) slots used was strange and that type of screw driver was not available to the public. It is call an "offset cruciform recess screw head". So we needed special tools just to screw them in. The screws and hardware would come in



vacuum sealed plastic bags. We were directed to use only the items provided in these bags. We needed to get our tools from the tool shack and the parts from the parts department and the blue prints from the blueprint crib. Tools would be returned every day to the tool shack. The reason being is that they did not want any tools to be left in the space

craft. We couldn't bring our own tools to work so this was controlled very carefully and was inconvenient for doing any work. The photo with the spacecraft in tow is with my crew but I am not in the photo, another rare find. The photo is from the company newspaper (Skywriter May 3, 1968)



At the start of every shift we needed to wait in line to get our job assignments, and wait in line to check out tools at the tool crib. Then we would stand in line again to get our parts. Then we would stand in line in front of the door of the space craft in the test stand until it was our turn to do what was assigned for us to do inside the space capsule. So there was a lot of running around and standing in lines. We were expected to be prepared when our turn came.

The inspector would make a list of all the tools and parts that you took inside the Command Module then check the installation. The Inspectors would verify the work installed and checked

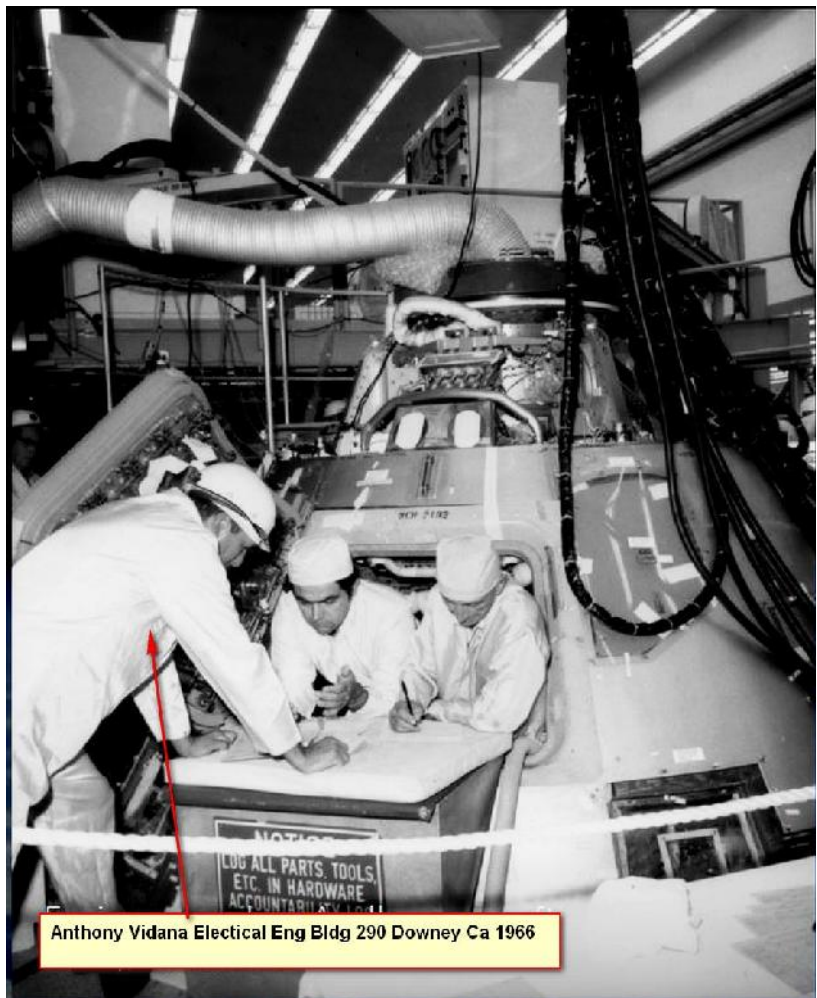
to see that you took out the same tools you brought in from his tool list. NASA was concerned about loose items left in the module because they would get loose in space and could cause a short or cause damage.

If the part did not fit or was missing components or hardware, which happened a lot, then we would fill out a form for engineering to correct the discrepancy. You would then be assigned a different job and the cycle would start all over again.

A lot of times the mounting screws were the wrong size. Then a report had to be sent to the engineering department. Engineering would have to send somebody from their department to investigate the discrepancy. Then they would have to change the blue print and order a new set of screws in vacuum sealed bags. Then these screws were sent to us through a long chain of logistics in the company then we got them. So it was a long drawn out process that took a lot of time for the simplest of things. We could short cut the system by getting screws from a bag for a different part but that would screw up the next guy that needed those screws for the part we got it from.

Coordination between shifts for these parts swaps were not always great because everyone always left their shift in a hurry. Some cabinets in our department were locked at night by mistake by day shift or vice versa that had supplies, parts or equipment needed to get the job done. We had to pick the cabinet's lock to open them. I learn to pick locks there from working on nights. Day shift would get a lock smith to open them or were just cut. The stuff belonged to the company and not to employees. But a lot of times it became personal to them. Items had to be hunted down because they were not returned. This would cause friction between the technicians from different shifts.

Sometimes the guide cards were not ready, and then it was worse. The supervisor said we needed to look busy or disappear, he meant hid. As Union bargaining unit employees, we were not



Anthony Vidana Electrical Eng Bldg 290 Downey Ca 1966

Apollo Block 2 Vehicle-2TV1 Crew Chief Anthony D. Vidana



allowed to leave the plant except at lunch hour and change of shifts. Getting caught doing nothing by other management meant we were subject to being fired. Our management would never admit to having us look busy because they could get fired too. All the Companies I worked for did it at one time or other to keep from losing their staff. It was another little game we played at work.

To look busy we usually would take a hand cart and go our merry way someplace far away from the work area but you had to keep moving and not stop to visit. At nights the other buildings were sometimes empty of employees so wandering around the plant would sometimes make us stick out like a sore thumb. Boy, it's hard to look busy for a twelve hour shift. We wanted the big bucks so nobody complained.

This hiding business was not true for the salary employees like bosses and engineers, but usually happened with union bargaining unit employees who were on the time clock and got paid overtime. There was a big caste system there. Salary employees could just leave the plant at any time. Bargaining union employee needed a pass from their supervisors to leave the plant during business hours. Bargaining unit employees were not permitted to use the phone either. At times I felt like I was in prison because of the system there. The alternative was unemployment so I just soldier on.

Salary personnel and bargaining unit employees were not permitted to socialize together during business hours and in some cases after work. It was career limiting as said by the bosses. The main challenge at work was to fight boredom and staying awake. The technical stuff was easy for me.

The lead man noticed that I was good at fixing the work line items on the guide cards that were screwed up. So he always gave me the problem jobs to work on. I like the challenge because it kept me busy and made the time fly by. I got to meet a lot of the different engineers and technical staff that way too. This was because changes and corrections had to go through the engineering change order system. This problem solving experience helped me later on as an Engineer. We needed the little tag attached to our badge to enter bldg 290.



Another time Joe Cuzzupoli Spacecraft 012 head engineer assigned the Electronic Technicians to install the tubing for some liquid system (water glycol) on one of the bird at some liquid testing room in building one. He did this because the company title for Electronic Technicians was Electrical Mechanical Technician. The union title was probably a holdover from WW2 aircraft workers. I was there with Painter and some of the other guys from our crew. We told the engineer in charge we were not qualified to do that kind of work but he made us do it anyway. When the test was performed all the pipe couplings leak. After examination it was found that the 'O' rings were missing. We asked what was an 'O' ring. They were not included in the assembly kit and not shown on the Mechanical drawings. It was a mistake by the Engineer to use un-qualified people to put in the tubing but it was a learning curve for him. The engineer in charge Joe Cuzzupoli later became one of the best Vice President's of the Division. This same person presented me with the Exception Achievement Awarded year's later-small world. As a



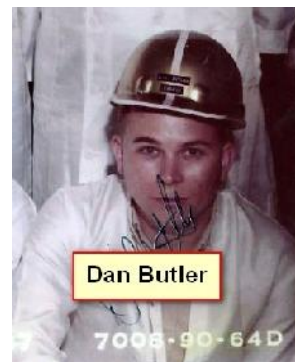
result of this incident, Electronic Technicians were no longer used to put in plumbing on the Apollo-good move Joe.

**Our Crew:** In March of 1966 the older lead had a heart attack while he was at work man (as well as 10 percent of the division older guys during the Apollo era). We didn't find out what finally happen to him. It was not unusual for lead men to have heart attacks and shortly later die.

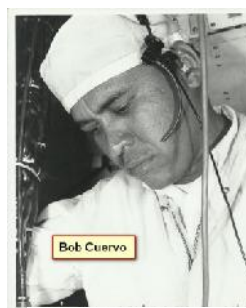
He was replaced by a guy name Butler who was 21 years old and was place there by the union from a grievance he had filed. The other guys in the group would not accept him as a lead. I was the oldest and had the most seniority in that group. I told them that if they went against Butler they were going against me too. I said that because I was supporting the union decision promoting Butler because it was how I had gotten my promotion too. The other guys in the group were rookies at Rockwell so they stood down. I became Butler's wing man and we became friends.

Six years later Dan quit because he couldn't take the pressure anymore.

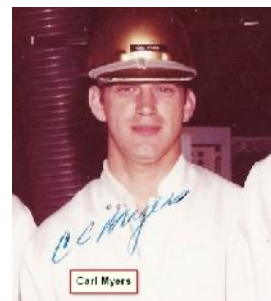
I got along with all the crew, somehow they all liked me. I guess going out drinking together helped. There was my friend Carl Myers who was a serious intelligent guy who became an engineer at B1 Division of Rockwell.. Robert Martin Cuevo- an inspector who was a Native American is my friend too. Cuervo later became a Quality Engineer was involved with all the Apollo form construction to retrieval at sea.. My friend Ed Painter was majoring in Social Studies in college and became a school teacher so we had a common bond because we were both part time students. He was a Vietnam Vet so he always said to take a different rout in the plant when we were looking busy because management was like the Cong, they could ambush you if you repeated your same route. It was good logic and I always have followed his advice. Other guys I remember are: Rick Thomas a fun guy and Myron L Busboom who was well like by everyone, Busboom received the Space Division Snoopy Award (a great honor), went to the Airline business as a pilot and later worked for the FAA. Jaramillo and Olson were techs in our crew too. Another guy from our crew was Lynn Hallerand Travis-they were the inspectors that worked inside the command module 012 & 2TV1. There was a great camaraderie with our night crews in bldg 290 but I can't remember all their names. Olson had a private pilot's license and went to follow a career as a commercial pilot with Busboom.



Dan Butler



Bob Cuervo



Carl Myers



Myron Busboom  
(buzz)

Management was not ever considered nice people by the rank and file employees. Engineers were also put in the same category as manage because they were a pain and could cause you some problems. This was just part of the stupid caste system thinking at Rockwell as well as other aerospace plants. I like the Engineers because I wanted to be one of them and it was my

goal to get into engineering. I thought management was okay but I never did trust them either. I had too many bad experiences and encounter with Management. Management was the people that controlled your life at work which ultimately affected your life outside of work. I don't feel that way now because I have worked with a lot of great guys in management, but I have had my share of bad ones. After the bird (spacecraft) was completely assembled, testing would begin in April of 1966.

I did not attend college in the fall of 65. I attended college the spring of 66 because if I didn't continue that spring, I would be dropped from the Industrial Technology program. So I took a Physics class and Physics Lab during the day and hoped for the best. I don't know remember how I attend classes because I was working so much. I remember it was nice to attend class and get away from the madness at work even for a short time. It was not that difficult. Even though I was working a lot of hours I had a lot of free time in my hand at work. I could study at work. I had a hard time understanding the teacher too because he was Chinese and couldn't speak English well at all. I couldn't understand the teacher so I went a lot by the Text book. Some of the problems in the test I got the correct answer using methods shown in the book but I was not using the method shown in class. Then the professor would give me no points for that problem, bumner. Yes it was that kind of class, not that sweet. I passed the class with a C. Not great, but good enough. Looking back I don't know how I attended the class much less past it, oh I remember I was young then. I was older than my fellow students so the other students thought I taught there.

### Apollo Integrated Systems Testing

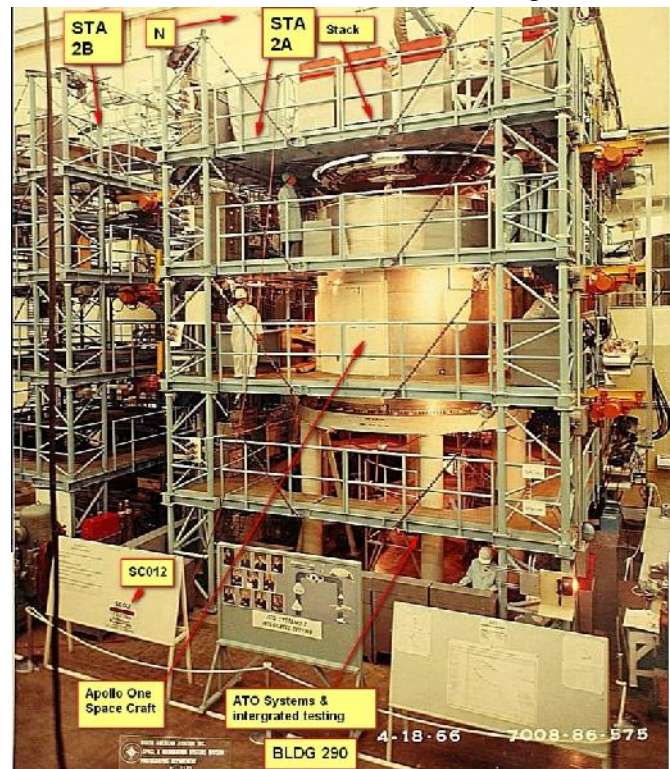


Apollo one

Before the integrated testing of the Apollo there was a pressure test performed, then there was a long drawn out process of cross continuity testing of every component installed on the



Control Rm (ATO) bldg 290 2nd floor

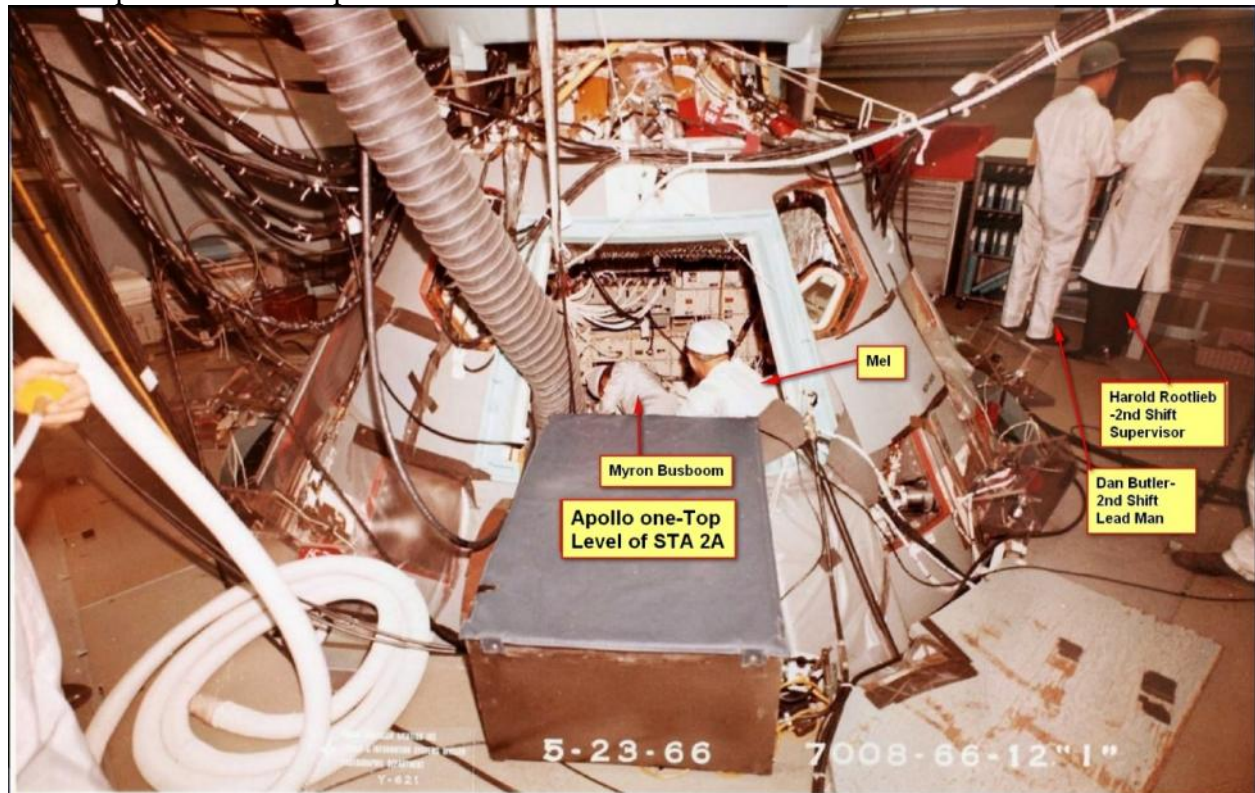


Apollo 1 on stack Station 2A

command and service module. Initiation of testing of Spacecraft 012 began on May of 1966. It was called Integrated Systems Testing. It was conducted in two phases: "plugs-in" and "plug-out" check out in which the command and service modules subsystems are operated together though a complete simulated mission. Plug -in test used line power and hard line communication from the building. Plugs-out test used simulated



fuel cell power from the spacecraft and wireless communication.



Lead man Dan Butler with green hard hat with some of our crew (buz) inside Apollo one during testing (ATO) on top floor of stack Station 2A..

I thought testing it would be better than what we had been by doing –fabrication assembly. But it was a slow process that just dragged on. I was nicknamed flash at work by the other technicians because I could get my work done so quickly then as I do now. So that may have affected my thinking then that the testing was slow. Thinking back it would be consider going very fast now. The photo is the Apollo control room in KSC made the same as ours in the 2nd floor of bldg 290.

This testing process consisted of having everyone assigned different work stations located throughout the building and the Apollo spacecraft. We all had head set intercoms that were hard to hear with because of the static noise. The intercom background noise was really bad. One of the Astronauts commented that “if we can’t hear our self in the intercom here, how are we going to be heard from space”. It was a good comment but they never solve the problem of the poor intercom system at bldg 290. Looking in Wikipedia on the internet, Grissom made a similar comment at the cape at the last simulated countdown "How are we going to get to the Moon if we can’t talk between three buildings?” So the intercom problem was never solved on this Command Module. Spacecraft 2TV1 (an Apollo Simulator) had that same problem but other spacecraft didn’t seem to have that problem when they were in space.

The TC (Test Conductor) in the control room ATO (Apollo Test and Operations) would direct the work. He was the person in charge. He began by following a list on a document (some kind



of planned checkout list) that was about 5 inches thick, with 11-1/2" by 18" sheets, that was bound in a binder and read length wise. The Check out list was called OCP-0131 which translates to Operational Checkout Procedure #131 which was Integrated Vehicle Test. It was about 1500 pages of procedures and took 4 months working 24/7 to complete on Spacecraft 012.

Everyone at each work station had one of these documents and The Test conductor would read it line by line. Every line would cover a test of some sort. If a test failed then the process would stop until the discrepancy was found and corrected. Then we would go to the beginning of the list and start over again. The testing was continuous on a 24 hour basis, 7 days a week. It still took months to go through and complete the checkout list.

I did not realize there was as ACE mainframe computer driving this test and all the consoles and spacecraft was interfaced with it. The Computer Room, Control Room and RF room were locked with very restricted access to those rooms. Everything was secret that when on in those rooms. But we could hear them through our headsets during the Integrated Checkout Test.

We did the final testing on the Apollo Command and Service Modules in building 290 in Downey. While testing the Apollo we had almost 75 people on a network each with call signs and each having some responsibility to support the test.

As an example, The SCS (Stabilization and Control) engineer located in the control room (Apollo Test and Operations) would get on the net (intercom) and say, "CMP, this is SCS. Switch mode to manual". CMP was the Command Module Pilot (me or another technician or the astronaut) that was sitting in the spacecraft Command Module 100 feet away and 2 stories up from the Control room and I would hear the order and make the switch change. I would respond with "SCS, this is CMP, mode switch now manual" and so on.

On one station I had to fire the squib to release the Parachute from the Command Modules. A squib is an explosive to fire a release to a locking device. The explosives were not connected; it was just a simulated firing. I waited one week before my turn came. In the command module we would throw switches and turn knobs that would illuminate lights and change computer indications and so on. I worked at all other work stations on the spacecraft turning or depressing panel switches when my turn came. The crew was rotated or changed to different work stations on random daily basics.

Another position was WPA (Water Process Assembly-Glycol Pump); this was a water glycol pump that was located outside building 290 in a small tent. The glycol liquid was used to cool the systems inside the bird. The guy posted there was also on the intercom. His job was to notify the TC if the pump was operating at all time. This position was boring but essential because if the pump stopped the systems would heat up and damage the Apollo equipment. A WPA pump failure warning gave the TC time to perform a controlled shut down of all Apollo operating systems. I believe the pump did fail a few times. We had this old guy that was in his 50's manning that position because nobody wanted to do that kind of work. This guy was an alcoholic that would drink all night there, so he liked the job. Sometime the TC would call for the WPA and we would get no response. The TC would send someone to the WPA station to find out the

problem. The WPA tech would be passed out. Somebody would wake him and he would report that the intercom had failed and was now fixed. We were working close for so many hours that the guys in our crew would cover for each other. I asked the guy at WPA why he drank so much. He said he was in pain all the time so drinking killed the pain. Nice story. I think he got caught once too many times and management got rid of him.

The photo is of my back in the white jumpsuit with the inspector in blue checking my work in the lower equipment bay of the space module (Space craft 012). The photo shows the equipment completely installed- dated 7 25 1966. The photo was donated by the photographer (Norm Casson collection) to the San Diego Air and Space Museum and is on line on a web site called Flickr.

There was 30, 000 employees at Downey facility but only 3 people could fit in the capsule at a time and at times that was me or one of our crew, the inspector and the astronaut. The Technician could be Jaramillo's back instead of mine.



Vidana- CSM 012 Apollo one July 1966 –Left side Lower Equipment Bay (environmental Equipment)

Me inside Apollo

In areas away from the command Modules we sat there reading novels until our turn came to do something. They were erotic text novels circulated by the guys. They got real old and boring to read. But it was the only thing available. I was too stupid to buy my own novels with subjects I liked. Actually I did like science fiction but since I was working on science fiction what was the point in reading about it.

### **Private Discussions with the Astronauts**

There was not any hobnobbing with the astronauts. They and our crew were treated like co workers. When I worked in the Command Module I would ask the astronaut what was it like in space? Sometimes the Command module was a private place during testing and there was always at least one astronaut assigned there during all of the testing. Sometimes I was the one that was alone with the astronaut in there with a lot of time on our hands for conversations.

I learned that all the astronauts had a business deal with a publisher to not talk about their travels in space or their life experiences. They told me it was some copy write agreement between them. So mum was the word.

One of the former Mercury Astronaut was different. There was a newspaper article that Gordon Cooper "had seen a glowing, greenish object ahead of him quickly approaching his capsule" in space. Gordon Cooper the astronaut told me he did saw some object in space and it scared him. The mercury spacecraft could only carried one Astronaut into space and he

### **Sees Light Below**

On the second nightside pass, however, he said he observed a light that seemed to be coming up from below out of the darkened earth.

"Just as if someone was launching something up in front of me," he commented, "but I really didn't think they'd do that."

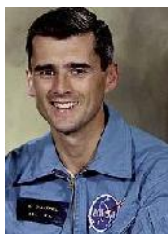
On his first pass over the darkened side of the earth, he said, he saw the famed "fireflies" first seen by John Glenn.

"They were bright, with a greenish tinge," he recalled, "and appeared to move back along the flight path."



was alone with that thing. I asked him for how long. He said the object came right next to the mercury spacecraft a few yards away and stayed there for about a day (20 plus hours) then it left quickly. He was sweating when he told me the tale. I asked him if it was saucer shape. He said no but it was a larger than the mercury spacecraft and he said it was bell shaped, more cylinder than bell and it was not greenish glowing, it was metallic. He wouldn't give me any more details and dropped the subject. Gordon cooper was a back up crew member for Apollo One and 10, and then he was kick out of NASA. I guess because he would not keep quiet about the UFO he saw. Cooper spent 222 hours in space on Mercury Freedom 7 and Gemini 6 Missions

I was surprised because this conversation just came out of the blue and it was totally unexpected. I know he slipped and told me this story in confidence. I did not tell anybody about this conversation, because I did not want to discredit myself or this astronaut. This is not a common believable topic. I also thought that I would lose my security clearances if anyone found out. I tried not to remember and or think about it. I had forgotten the name of the Astronaut because I have a hard time remembering people's name. But I remember and found the newspaper article about the green object seen by the astronaut in the mercury capsule in the internet-it jog my memory. It refers to Gordon Cooper and I am now positive it was Cooper. The photo is Gordon Cooper. . In Gordon Cooper's book "Leap of Faith" he denied it happened. I guess somebody got to him.



Mary my wife wanted me to get some autographs from any of the astronauts. The first astronaut I asked to sign his autograph was Roger Chaffee of Apollo 1 because I thought he was a regular good guy. We had several good interesting conversations together in the

Roger Chaffee Command module but not about space. He respected my desire to go to space and knew that was why I was working there. I told him that I figured that they would eventually need Electronic Technician's in space. He was good with that. Chaffee was close to my age and was an engineer too so I thought he was approachable. The other astronaut's were older and not so approachable but they too were regular guys.

Chaffee agreed to sign the autograph but he dropped the pen. He knocked over some jumper wires that we were testing with when he was reaching for the fallen pen. This disrupted the test that was going on. I thought I was going to get into trouble. But all I was given from my supervisor was a stern warning not to ask for the Astronaut's autograph. This went for all of us there. After all that, Mary did get her autograph from Roger Chaffee. Mission accomplished but that autograph was lost in some moves but found again.



Apollo one Astronauts







Gus Grissom

I asked the astronauts if they were afraid to go to space. They said it didn't bother them. Even astronaut Gus Grissom of Apollo 1 who always made fun of the Spacecraft calling it a lemon, was not afraid to go in to space. These Astronauts knew and were told that the odds were a thousand to one that they could die (which are not good odds), but it didn't faze them. They were flyboys from the military that knew no fear. They were brave guys. Apollo 13 was another example of my fears. That bird almost didn't get back either. After Apollo 17 the program has cancelled. We have not gone to the moon again and future trips to the moon have just been cancelled by President Obama-maybe trump will bring it back. It's amazing we got to the moon and back with the primitive technology and equipment we had then. Of course we had the best technical people in the country working on this program. I also talked to the third Astronaut of Apollo One, Walter Cunningham but it was just job related. All the Astronauts treated everyone working there with a lot of respect-it was mutual with us too. They were great guys.

The lunar landing and lunar take off seems too complicated to me then. I did not think they could complete the mission but just circle the Moon instead. But I kept my opinion to myself and hoped I was wrong. The bird I had been working on in Downey Apollo One C/M (command module) 012 wound up burning up during testing in Florida on January 27 1967 killing these three astronauts. I was not there for the event. But I had worked with these Astronauts and went to lunch with them too. I knew these astronauts White, Grissom and Chaffee personally so it affected me directly when they died. But I am getting ahead of myself.

### **Too Many Hours for Too Much Money**

My hourly rate was \$3.50 per hour rate at Rockwell), working 84 before taxes \$399.00 /Wk). I was from the overtime pay that I wanted. Mary said we needed the also wanted a refrigerator and an got. We bought a 27" Black and bought a bunch of stuff. It was like Christmas every paycheck. But in reality it was just good money, but for a person that was brought up in a low income community like East Los Angeles it was great. These wages were common for everyday construction workers that worked a little overtime.



(highest maximum union hours per week (Gross making so much money started buying everything we house fixed- we did that. She up right over/stove that we White TV too. Actually we

Anyway, I bought a new motor cycle for cash with almost one paycheck (about \$500.00). It was a 1967 Yamaha 305 with a 2 cycle engine that summer, again with one paycheck. Actually I bought the cycle used, from my lead man in 1966, Butler who had it for a couple of weeks. He sold it to me because his wife was going to leave him because of the bike. A few years later they got divorced anyway. Mary did not approve of the Motor cycle either, but I bought it anyway. The 67 motorcycle came out sometime in 1966 that year. It was consider a 1967 for marketing purposes. Some time in this time frame in the fall of 1966, I also bought a 4 speeds, 4 barrow, metallic gold brown, 67 Mustang (\$2,500) with a black vinyl hard top which Mary then drove. Again the 67 Mustang came out sometime in fall of 1966 that year. I drove my motorcycle to

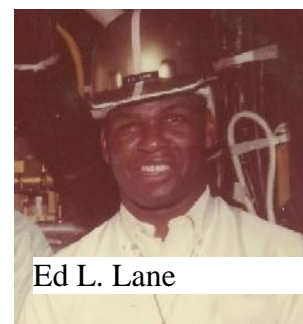
work or my trusty old 62 Ford Falcon. I wanted to buy a cobra but my insurance agent said the insurance would be too high for me.

I really liked my bike and the Mustang. Lots of guys from our crews were buying and riding bikes. Me and the guys in our crew that had bikes would ride them at lunch time 8:00 PM and after work in the morning. We would do a lot of dumb things like drag each other. I could keep it in a wheelie up to fourth gear. It would scare the other bike riders I was dragging. Risky behavior is the first sign of PTSD.



Another time with the motorcycle, I ran into the power pole at the corner in front of my house, about two doors down and knocked myself out. When I woke up a young little neighbor kid was standing next to me and asked why I was laying on the ground. Then Mary drove by in the Mustang, she stopped momentary, and said “I told you that you would kill yourself with that motorcycle”. She did not assist me, she just drove off. Mary always believed in the Spartan philology of march or die then.

I enjoyed giving my son Tony rides on front of me on the motorcycle. Tony was about six then. I had to stop doing that because a policeman pulled me over and said Tony had to ride in the back. I was afraid to do that because he might have let go and fallen off the bike. So I stopped giving Tony rides on the motorcycle. About a year later I got chicken, all of the sudden, riding the bike one night and I then sold it. I had about 5000 miles on it. The guy I sold it too ran the motorcycle without oil and burn out the engine in one week.



**Apollo Spacecraft 2TV1** In the late summer of 1966 the service module was shipped out on Aug 9 and on Aug 25 Spacecraft CSM 012, Apollo 1

was completed and my wife was in the hospital suffering from nervous breakdown. Our crews were busted up and I was assigned a new Spacecraft 2TV1. Some of the guys that were single were selected to go with spacecraft 012 to the Kenney Space center at the cape in Florida. One of the mechanical guys from our crew from 3<sup>rd</sup> shift called Batman went too. We called him Bat Man (Samuel Clemmons) because he had a large Batman symbol painted behind his hard hat. I like the symbol so I had a small Bat Man symbol too and I also put it behind my hardhat. I made the symbol by cutting it out from black electricians tape. I don't remember who came up first with the idea of using tape, probably me. Ed L. Lane became our lead man on 2TV1.



Management had hard hats that were gold with a black strip behind it. After we had completed Spacecraft 012 our two supervisors Harold Rootlieb and O Dell let the guys paint our white hard hats gold. I guess it was kind of a reward. As a joke one of the guys put some oil on my hard hat

before they painted them and after they painted it my hat it came out with a cracked finish. I was pissed but I wanted to get the best of the joker. All the crew was waiting for my reaction. I told everyone I liked it because it was original and would stand out. Remember I am good at deception. So the joke was on them. Later on my supervisor O Dell got on me about my hard hat. He didn't want me to wear it anymore. I told him why it was that way. I was glad he forced me to get rid of the hat. So my honor was saved and I had got the best of everyone and I was okay with my boss. But I had to go back to wearing a white hard hat again. We were not allowed to take home the hard hats.



2TV-1 Pacesetter SC98 day shift

The guy that doctored my hard hat was always spraying all the crew with liquid Freon. The Freon was used to clean the spacecraft. Anyway Freon is freezing to the touch and he would spray us Freon at anytime and run away. We complained to our boss but he didn't do anything about it. He told us to solve our problem with him. So I devised a plan to strike back at this joker. The entire crew was involved in my plan. The floor levels of the test stand are made from open grided metal. The lead man sent Joker to the second level of the test stand to talk to one of the crew members there. That person was to talk to the joker and line him

up directly below us. Two of us were waiting on third level with a 5 gal container of Freon directly over him and we spilled the liquid on him. He yelled and asked that to do. We told him to get out of his clothes and go to Medical. That's what he did and he still wound up with frost bite. We told our boss that it was an accident that we tripped and spilled the Freon container. Everyone (rank and file) was evolved so management bought the story. That didn't stop the joker he when back to spraying the crew with Freon again. This guy had a screw loose. Anyway, that is why he sabotaged the paint job on my hard hat. It was his way of pay back. I liked this guy but he was irritating.



I was now assigned to work on spacecraft 2TV1. This was a simulator spacecraft to be used in Houston. The Spacecraft was placed in the next test stand from where Spacecraft 012 used to be. It was undergoing Final assembly and almost ready for checkout test. I was still assigned to second shift but as Crew Chief.

The Technician crew on second shift from Houston was assigned to this bird. They were there to learn how to test the Apollo 2TV1 spacecraft and would be operating it when it was delivered to Houston. They replaced our crew members that were sent to the cape with Spacecraft 012. Our supervisor O Dell liked these guys and would cater to them. My new lead man was called Ed Lane, a black guy my age. I was again the wing man for this guy and he too became my friend.

On 2TV1 we were assigned a couple of experienced women assemblers from our plant to help us. They were a great help because they could do the wiring way better than the male Electronic Technicians. It also helped because the guys now had to reframe from using so much colorful language.

The common protocol at Rockwell was to use a person's last name at work. The guys from Houston called my friend Pointer and instead of Painter and called me Vagina stead of Vidana. But they were excellent workers and fellow employees so I overlooked their short coming and amazingly we got along fine with them. After a small personal altercation with one of these guys they started using more manners around all our crew and everyone else there including the women.

### **Disaster at work and home**

Let me go back one year and talk about home events. As I said before the guys at work in Downey were having a rough time with their work schedules when I was working nights on the Apollo Command Module. That was true throughout the division. They had heart attacks (about 10 percent of Space Division employees died during the Apollo era) or their wife's were having nervous break downs or they were being divorced by their wife's.

We were now working normal 5 or 6 days 8 hour shifts. I wanted to get things rolling at college so I felt with the reduce hours at work and doing my homework in class. It was safe to carry a heavy load at College. It was a bad decision. I should have known better. It was my bridge to far. I was not thinking clearly and making bad decisions and sticking to them. I was working so much overtime for so long a period of time and had so much money that I was not thinking clearly. Thinking back now it is obvious that I was over confident and a little coo-coo in the head like fighting and etc and suffering from PTSD. I was trying to do impossible things. But I didn't know that then.

In September I perform some work in the control room that impressed the Test conductor (TC). He decided to interview me for a job position as a permanent test engineer. He interviewed me the next day on day shift.

A couple of weeks later in Oct 1966 we were told to we had to change our job classifications to Senior Spacecraft Technician labor grade 17. I decided I would agree to this change only if they made me a lead man since I could not be an engineer. I was the most senior man in this area and knew the work better than anyone. Lead man only made 20 cents more an hour but it was a stepping stone to management and I needed the experience in my career for my college disciple in Industrial Technology. My supervisor O Dell agreed. He said that he would make me lead man but only after I had sign my changed of classification. I did not believe him. You know he was part of management and I didn't want to file a grievance to get lead man. I had just completed a job interview and was considered for a position as an engineer. So I was feeling hot shit.

Another reason I did not want to change classifications was because Bldg 290 in Downey and maybe the Vertical Assembly Bldg. in Seal Beach were the only places in this company or any company for that matter that had that new classification Spacecraft Technician. I thought I would be subject to an easy lay off when the space craft's were completed. It would be hard to find employment with another company as a Spacecraft Technician. There was tons of Electronic Technicians employed in Southern California so I would take my chances with my existing classification as Senor Electronic Technician.

I explain my all my reason to management but they didn't buy it. I known now they were right they were a poor reasons. I was just stupid and stubborn part of my PTSD. I was the only employee in the company to refuse the Classification of Senor Spacecraft Technician. It made my management look very bad to their superiors. The other problem is I was considered one of the outstanding technicians by the second shift Engineering Test Conductor. He was considering promoting me to the Engineering staff and used me for checking out the Apollo at an engineering level in the Control Room. I should have signed the change of classification and focus on my school and not worry about the future lay off that were three years away. Three years is a life of a project in the aerospace industry. So it was stupid of me but maybe not. My supervisor may have had it in for me and it may have gotten worse for me anyway.

Both of these things (the engineering interview and the classification change) it did not sit well with my management but mostly the classification issue. I had made my boss look bad to his superiors and NASA. I was stepping on some big toes. My boss was mean, as punishment I was loan on day shift for two weeks in the end of fall (about November) of 1966. I was now washing portable test stands in front of the Bldg 6 engineering offices. It was really embarrassing doing this kind work in front of the engineering offices of the TC that I had just had a job interview with. It did not sit well with him or his engineer staff. I was not playing ball. It ended my chances to get promoted to engineer. I knew that night shift employees were considered black sheep by management thought out the company and staying on days is almost impossible.

**The Pressure Chamber Bldg 260:** After my short stay on first shift washing Apollo portable racks I was placed back on night shift still in Downey but in the Pressure chamber building for testing the the pressure of Apollo Service Module. The underground Chamber used in



case the Service module exploded. The pressure chamber was a strange place. There was a small bldg at ground level that housed the control room with a large room underground that was the chamber. They would connect some cables to the spacecraft Service Module and run pressure on the bird there. I actually did nothing there because they didn't have a Spacecraft Service Module available to test when I was there. They did familiarize me with the test process. For lunch part of the crew would go in the Pressure Chamber to eat. I thought it was a bad idea because there was not a PA or intercom system between the chamber and the control room. The chamber doors were operated from the control room with no means to open the door from the inside. So it was a dangerous place to eat lunch and I did not eat there. I stayed at that place a couple of weeks. Management strategy was to bounce me around till I agreed to the classification change.

**Seal Beach Vertical Test Bldg** I was transferred to Seal Beach still on nights about December of 1966 working on the second stage section on the Saturn V rocket. I was moved around

because I would not consent to the change of job classification but I was still on nights. I was assigned to the Vertical Assembly Building in Seal Beach. This building housed the Second Stage Rocket of the Saturn Rocket and it was where it was tested. The building was about 10 stories high. It was winter and near the beach so it was cold and foggy every night. When I got there the technicians were installing cables in the control room beneath the raise floor. We did that for a couple of weeks. One time my boss assigned me to change the



Bulb of the warning beacon. This light was located on a vertical 12" steel beam sticking 10 ft from roof of the building. The steel beam was wet from the moisture there and slippery. I refused to do it and the boss said he would fire me. But one of our crew members went up there with me and changed the bulb. He walked across the beam, changed the bulb like it was a Sunday walk in the park and returned. He was sure footed and not afraid of heights so it was no big deal to him. The issue was dropped by my boss. I was not impressed with the Second Stage Saturn V. It was a large Liquid storage tank with rockets attached to the bottom but it was still essential work.

Jumping back a year-I had been to Seal Beach before. I remembered I arrived to find the parking lot and the plant full of water at Seal Beach Facility. What had happened was the SII was being pressure test to 3 Psi on second shift. Well the pressure gage was not connected. The gages were not reading any pressure. So the SII had been pressurized until it ruptured and dumped all the water into the facility. The internet claimed it happened on 28 May 1966- I was working on the Apollo then- our crew was sent to do some training at Seal Beach Facility on that day to certify our use for soldering and cable crimping.



Seal Beach-This place was a screwy place and I did not like working there and the boss there did not like me either. The supervisor name was Von Losberg or something that sounded like that, he was a colorful guy. The boss thought of himself as a single swinger. He used Man Tan, wore boss sweaters, tight pants and Cha-Cha boots like Tom Jones. He thought he was hot shit. He had a staff of guys that worked for him wore the same attire and acted like him. After working there about a month they asked for volunteers to work temporarily at the Autonetics facility in the same building that I was an inspector in the pass. I jump at the chance to get out of there also it was an opportunity to visit old friends at Autonetics.

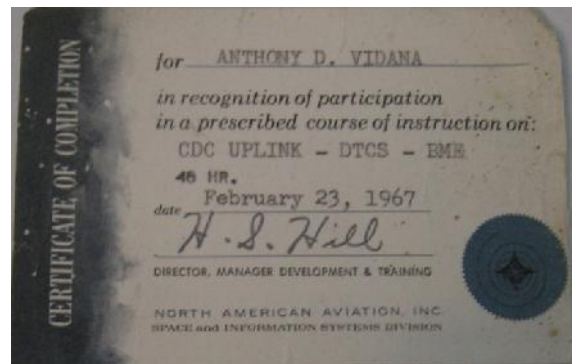
I was sent to Anaheim on nights Jan of 1967. I was working by myself in this large room that had about a hundred people working there during the day. They were testing the computers used on some air to air missile. Anyway it was using a computer that I had worked on before (D17B) that was the size of a house air conditioning unit. This computer (D37C) had been miniaturizing to the size of a shoe box using micro- technology circuitry.

They were having trouble syncing the computer to the testing device. The engineers knew the test device circuit stage that was causing the problem but they did not know how to fix it. They were stuck for two months and the test device was way behind schedule. The test device was using commercial Honeywell boards with a lot of Technical information available.

They asked me to have a go at it. Well I was stumped. The dang thing didn't want to work with the test procedure of the test device. So I studied the Honeywell manual. I figured that the computer syncing pulse was too fast to sync with the rise time of the computer pulse. I notice that the fall time was a little longer than the raise time. So I change the jumper to the fall time of the pulse instead of the rise time. The next day the engineer found the system working. When I arrive at work that night they asked me how I fixed it.

I told them but they said it didn't make much sense. But it worked so they adopted the change. I think the Engineers didn't understand my solution because I used an analog method solution to fix a digital problem. These engineers were trained to look for digital methods for solution so I was thinking outside of the digital box. I was proud to have fixed the problem they were having- mission accomplished.

Since I solved the problem, they didn't need me anymore. I was sent back to Seal Beach. I had worked there about two weeks. I was sad to leave, I liked it there. About then I learn of the Apollo one tragic fire and the death of the astronauts I had worked with. The whole company was devastated.

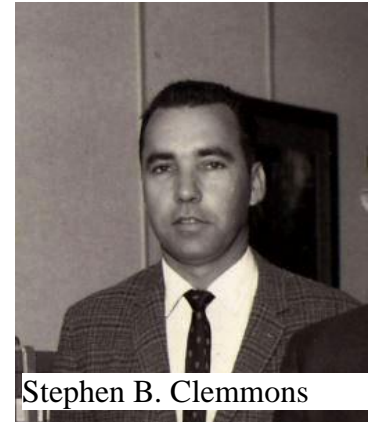


On return to Seal Beach in I was pressed by the boss again to sign the classification change to Senior Spacecraft Technician. I refused again. In (Feb 23 1967) I was trained for the uplink for the Apollo Ace Station, it was a computer class using the control data CDC 160G and CDC 924a Computers. The CDC 160 was used in the ACE Computer Room in bldg 290 and the CDC924a was used for in the Cortrol Room testing the second stage of the Saturn Rocket at Seal Beach. I was happy- finally so actual training on the computer we used for testing. I learn to test the flight computers used in the test. I also learned about the base 8 numbering system used on the

flight rocket and spacecraft computers. This Base 8<sup>th</sup> system reduces the amount of transistors require to do the computations on a computer by about 20 percent. So the computers can be made smaller and lighter. I made use of this knowledge to test the Apollo flight computers in 1969.

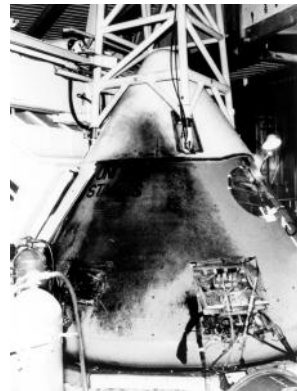
**Apollo 1 Disaster** But I still missed working on the Apollo and that door was not open to me anymore, I thought. This is a good time to stop and discuss what happen to my bird at the cape. Disaster had struck my bird, Apollo SC 012. The Apollo had burnt up during testing at the launch stand in January 1967, killing all three astronauts in Cape Canaveral (Kennedy Space Center) that I worked with. I was working at Seal Beach, Ca at the time of the incident and the glory of working on the Apollo was now gone.

Batman (Stephen B Clemmons) my former co-worker on the Apollo had return to Downey and I ran into him in spring of 1967 in Bldg 290. I asked him what happen at the cape. He said they were having some problems in the lower equipment bay (see photo at left) where the environmental unit is located. Chaffee (Astronaut that was an engineer) went back down to check it out. There were jumpers or wires down there and he may have knocked one off and it caused a spark. Then the cabin fire started.



Stephen B. Clemmons

I asked him when the fire started, “why didn’t the astronauts exit (the Apollo) through the lunar module hatch on top?” He told me that there was a cable assembly on top of the Command Module and other stuff- it blocked the exit. They were way too heavy to move them. From photos of the Accident there was a huge large bracket that held these cables. Now that have seen them I was familiar with these cables but in addition it also had an escape rocket attached and it did weight a ton or more. He told me he got a fire axe and tried



to get them out that way, He said that the axe just made things worse, it sprung the door. It is mentioned in the after reports, that the outer boost protective hatch and doors were partially busted open from the explosion in the Command Module and the outer hatch was pried open. It has been a long time so I may have got thing mixed up when he told me what he witnessed. Maybe Clemmons was trying to pry open the door with the axe from edge of the door opening or there was not axe at all. But I found a photo on the

YouTube video of the damaged outer door hatches after the fire. It does



Lower equipment bay

looks like a dent from an axe so this may verify his claim to the damage to the door.

They still had to remove the bolts on the outer hatch BPC (Boost Protective Cover) to get them out and there were a lot bolts on the Hatch. Plus there were two more doors that use a special tool to open them. There were a total of two Hatch doors and the BPC Protective Hatch. We were not allowed to use power tools so the bolts were remove with hand tools. I had button down the BPC outer protective hatch when I worked on this spacecraft at Downey. It had 5 inch long hex bolts about 21 of them. We could only use torque ratchet wrenches so it took me and another technician about 30 minutes to screw or unscrew the outer hatch door. The after reports mentioned that the door had been modified to open with a key (see photo) which is different from the door I installed. That could be true too because the Apollo one was constantly having changes.

I told him the newspaper said they died right away in a few seconds. He said the newspapers lied. Clemens told me that the Astronauts were trying to claw their way out of there screaming and it took maybe a few minute for them to die. They just burned up alive. Remember we were all suffering heavily from TPSD so he may have remembered slightly incorrectly. There was a little viewing windows on the Command Module inter hatch doors and adjacent to the door. So he must have seen them that way. The Test Conductor had to make a quick decision because they had another gas that could be used to suppress the fire but it was decide that it would kill them from suffocation and the fire would kill them faster. So they decide not to use the other gas so they would not suffer as long. The entire company was depressed from that incident. Clemens story is a little different both times but close. Plus Stephens was a still a little shook up when he was telling me the tale. The Medical Board after reports determined that the astronauts died in 30 seconds of carbon monoxide asphyxia, with thermal burns as contributing causes. I guess the public would prefer to believe that instead. There is a mystery surrounding what actually happen and we will never know what exactly happen then. Clemens was awarded the medal for “exceptional bravery” by the president of the United States for attempting to rescue the astronauts. This is the highest metal awarded to civilian.

From the internet-The thorough investigation by the Apollo 204 Review Board of the Apollo accident determined that the test conditions at the time of the accident were "extremely hazardous." One theory is a faulty circuit along with the full oxygen atmosphere caused the fire. However, neither NASA nor the contractor prior to the accident recognized the test as being hazardous. Proper emergency equipment was not located in the "white room" surrounding the Apollo command module nor was emergency fire and medical rescue teams in attendance. The only explanation the committee offered is that NASA officials believed they had eliminated all sources of ignition, and since a fire requires an ignition source, combustible material, and oxygen, NASA believed that necessary and sufficient action had been taken to prevent a fire". This sounds like a good bureaucratic answer. The procedure was change to have a duel gas system when testing on earth and pure oxygen when in actual launch and in space. The board also said that there was poor workmanship -Ironically three year later this same crew worked on Apollo 11 the bird that went to the moon.

When spacecraft 0012 was tested at downey 6 months earlier with pure oxygen with the Astronauts inside- I suggested to the safety Engineer that they put a fire extinguisher in the

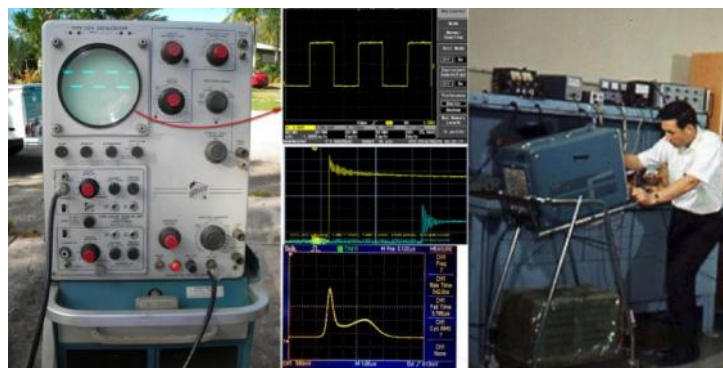


command module. He said that was not necessary because Oxygen is none combustible. I check the chemical tables and it's true Oxygen is not combustible. What I did not know was that pure Oxygen makes everything else around it combustible-that's how they weld. I wish I had made a bigger fuss to have fire extinguishers handy in and near the command module. Because of this accident I always made safety my biggest concerns at work just like Stephen B. Clemens. I did this even if it was career limiting at times. A lot of times it did limit my career but some workers in Idaho have not gotten sick from radiation because of me, but that's another story.

Because of the Apollo disaster, North American stock dropped and it was taken over by Rockwell Corp. Rockwell management took over the top management positions. Everything seemed the same at our work level.

**Return to Compton:** There was a short time when the company was sort of frozen because of the Apollo one fire and the changeover to Rockwell. I found out from Bob Cuevo (a crew mate) recently that Some Technicians were laid off in bldg 290 Downey during tht time. It was different in on nights in Seal Beach, the technicians were reporting to the office building in bldg 2 with no work assignments. In May of 1967 Management decided to finally send me to Compton or maybe North Long Beach (the forgotten Space Division facilities) still on the Saturn 2 program night shift as a Senior Electronic Technician. This time I would not be asked to change classifications because this Department did not use spacecraft people. I had traveled a full circle. I was back the same department 568 (now called 066) that I started with when I was transferred to the Apollo program. As an afterthought, my life would have been way better if I had agreed to become a Senior Spacecraft Technician back in Downey. Historically I had gained a lot of knowledge about the whole Apollo, Saturn systems and testing from all the transferring around. But amazingly it worked out good because being on night shift working by myself at Compton allow my work to shine.

The last TV episode of the Fugitive was airing on Aug 29, 1967. I was asked by fellow employees if I could rig up an oscilloscope (test equipment) to view it. I had never done that before and I was worried I would damage the scope. I rigged it up and it worked. 2<sup>nd</sup> shift watch that evening the last episode Fugitive.



One evening I was bored there myself at Compton as the only test and repair technician there on night shift. So I and the inspector cleaned out the back log of 200 electronic boards they had there and repair the ones that were defective. The assembler there helped by making the physical repairs to the electronic boards that were defective. Remember I was known as flash. This all happen in a matter of two weeks. All the guys on day shift were really upset with me because they hope to work overtime on those boards. I didn't care I was doing my job and did not want get overtime that way. Management was delighted because they were lucky to get 10 boards a week from the entire staff

on days. So the department was about two months ahead of schedule because of my efforts. This turn out to be a big deal.

I did not realize what all the fuss was about; I was just doing my job on nights. Because of my effort, the manager in charge was promoted to another Division. I was rewarded by management. They asked what I wanted and I told them to place me on day shift in the calibration lab. This was in Sept of 1967.

I was surprised, management complied and I was on days in the Calibration Lab the next day. I guess they really needed those boards at the cape. My current job classification permitted me to be in this job position. I preferred Day shift since I could no longer go to college during regular sessions. It also would help me lead a normal life at home. So now I was working in the Calibration Lab (Dept 048) which is considered the top position in the industry for Electronic Technicians. So it was a step up and I had reached the top of my profession as an Electronic Technician.

My job there was to calibrate and repair test equipment. The other guys there were not as good as me in trouble shooting and repairing. I fixed everything there that was considered un-repairable, so my lead man liked me. Our phone extension to the lab was 1812 or I eight one two as Gab called it. Ha! Ha! We would fix employee personal electronics for a donation to the Calibration Lab. The lead man Gab also would run the department gaming pool on the side. Every place I ever worked for has a guy like that there. It was a nice set up. The money we got from repairs would be used by Gab for the lab employees to pay for deep sea fishing trips from a day fishing boat in San Pedro. Gab also had a card game of hearts at each break and lunch time and of course, for money.

We were not always that busy so I worked on personal R&D projects that I saw in electronic magazines. Technical magazines were the internet of the era. We had all the advanced electronic components available in the lab and the latest test equipment to do it with. I worked on advanced circuit bread boarding, not stuff to take home. I worked with Tunnel diodes, Mosfets and other electronic components like those, which were the state of the art then; I wanted to understand how they functioned. I wanted to keep my Electronic Technical skills updated.



One Monday morning I went to work as usual. I was told to report to Downey Engineering Department (Dept 695) on the second floor of Bldg 6. This building housed all the engineers that worked on the building and testing of the Apollo Spacecraft Command Module and its components. I was in the right place where the action was and I was working back on the Apollo again. Yea! I met my new Engineering Supervisor Walt Wyden, a guy that look like and talked like a Damon Runyon character. I was offered a Job as an Associated Electronic Engineer. I was promoted from Assembler to Engineer in six years. This is fast for the aerospace business. It was really a big break- the problem now was to try to hang on to it now.

Well I had finally made it. My career had change for the better. I was offered \$4.00 per hour. Making the jump to engineering meant I would be recognize as an engineer in the Aerospace industry from then on. Hurray again. I was a professional now, not bad for a kid raised in slums of East Los Angeles. I accepted the offer. This happened on Nov of 1967.

## Badges

The badges in those days were round and pinned onto your white shirt (yes, Engineers all wore coats and ties to work). For most engineers there was a white badge with a Horizontal grey stripe across the badge with the person's name, title and organization on it. We called them white badges. It was nice because everyone could see you were an engineer. The rank and file bargaining unit employee wore yellow or orange badges with the department number in large characters. The "black badge" was a member of management and they had a white badge with a black horizontal stripe with white writing on the strip. I was promoted to a "White badge". It was a tremendous status symbol to former technicians like me and then two weeks after I got my white badge some management goofus decided to change out the badges to White plastic with our photo on it and get rid of the white badges. It was a nicer badge but the title was omitted. So the status was gone. I could be any salaried employee as far as the badge ID was concerned. The photo is my badge mounted on a pocket protector and my Key Punch Time Card in my shirt pocket.



I had caused some trouble within the union and this was one of the reasons I thought I was promoted to engineer or just a coincident. My fellow anti-union buddies said I had sold then out. I admitted that I did, but the union did not leave me any choice. So they believed me and I believed the union too. I also believed that this would be a temporary job in Engineering until the layoffs started and I would be the first to go. That turned out to be true.



I was assigned to the Engineering Ground Support (GSE) Department (Communication & Instrumentation & Sequential Systems Group) making \$4.00/ Per Hr as an Associate Research Engineer-it was a neat job. I thought the Union was going to get me a job as a Test Engineer but they up me one better. They put in the Engineering Department in bldg 6 that had the elite of the North American engineer's used in the Apollo space program. We had a row of guys near me that all had PHD's. The Guys called it PHD row. In our department the guys would sit all day

thinking. Then they would hand write down some technical information then give it to the typing pool to have it typed.

My job was to assist the engineer Mike Yakos working on the design of an Apollo checkout console called the C14-442. The C14-442 was called RF System C/O (Radio frequency Systems Check Out) Panel for Sub System C&D (Communication and Data). It was an impressive title (Seen foot note 7).





Yakos named the console after the model car he owned, which was an Oldsmobile model 442 super sports. The Oldsmobile 442 stands for 4 barrow carburetor, four speed transmissions with duel exhaust pipes. He told me his car was hot and it was.

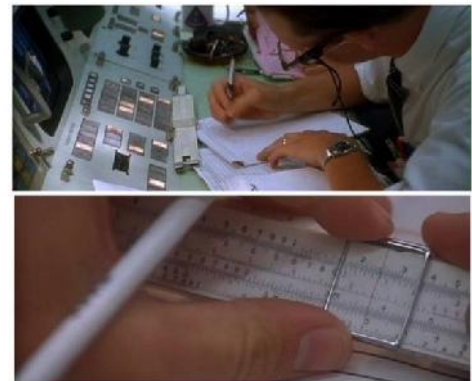
The C14-442 console was used to test the S-band communication equipment on the Apollo spacecraft from the command centers. The Mike Yakos was single and was a little younger than me (maybe 24). He was nice to work with. Some of the technical stuff he talked about went way over my head, but some of it struck. Microwave was and still is considered Black Magic in Electronics. Trust me it is. I had prior experience in testing microwave equipment as a Technician and I had a course in microwave theory and application in junior college with Kaspin. But at the level I was working at, lot of it was Greek to me. But I figured it out. There was a large earth quake five months after I got into Engineering and Mike left California because of that. I thought he was foolish to have those fears.

My job was also as a go-for to get sign offs approvals of Change Engineering Order Documents made by our section. We called them EO's. So I was used as go- for by the Group leader Irvine Marine. I would go to different departments in our Division and explain the changes to get the approvals from different Quality, Safety and Control Engineers from Rockwell. They used me because our engineers did not want to deal with them. They considered it busy work. I knew from experience how import these changes were to the technicians doing the testing. This gave me a lot of freedom and the run of the plant. I noticed that engineers are expected to do several jobs at a time which is deferent from technicians that are expected to do one job at a time. Multiple jobs cause a lot of pressure because engineers cannot focus on one thing to complete a job which causes a lot of stress. I learn to keep good documentation and files of ongoing projects because of the jumping around of projects priority.

About this time frame I passed English 1 and 2 for the spring and fall of 1968 at East Los Angeles. This met my lower division class English requirements for Cal State Long Beach.

### **Rockwell as an Engineer**

I did technical things in Engineering. For example I solved the problem of the instability of the S band testing equipment on the C14-442 console by replacing the Magnetron on the C14-442 checkout console with a Traveling Wave Tube (klystron). Yes I know more Techno babble. I did other things like that too. Everybody thinks that the Engineers had computers to work with then –we would use slide rules. The computers were used by programmers for very special purposes- for testing or payroll. Even in testing engineers were limited to a few buttons and routines.



### **C14-442 Apollo Check Out Console**

The official description of this console-*The Radio Frequency System Checkout Unit, Model No. C4-442 is a model of Apollo Ground Support Equipment. The Radio frequency*



Similar to C14-442



Anthony Vidana in RF RM

*System Checkout Unit, hereinafter referred to as "C14-442", is designed to support the performance of the combined and/or integrated system test of the Apollo spacecraft by measuring transmitted power and frequencies, furnishing radio frequency stimuli and carry pulse and band with analysis of the spacecraft communication system, the C14-442 is capable of applying test inputs to exercise the spacecraft communications systems and measure system responses. The C14-442 receives and/or transmits RF signals to the spacecraft either by hardline (loose loop) or antenna (open loop).*

One of the changes I did was to replace the magnetron to klystron amplifiers on the C14-442 to improve frequency stability. I added a clipper to the received signal. I also design a free standing storage cabinet for the C14-442 loose equipment such as cables and cable adapters. Yes-more Techno babble. I was trained to do this type of job so it was just normal work. This console continued to be used for the space Shuttle program so it had a long life of 50 years. The photo is similar to the C14-442. We also had a C14 442 in the RF room in Bldg 290. I am standing next to a cabinet I design in bldg 290 RF room that is used to stored hardware and cables used on the C14-442.

All the guys in the department were nice to me and we got along find. I played chess with a lot of engineers at lunch time and with the Apollo Chief Engineer (Charlie Feltz). I am really good at chess. As a fluke in 1955, I once tied the World champion Grand Master Chess player Samuel Reshevsky when I was in the chess club team in high school and I also took my division in the high school league.

I made one good friend in our group, his name was Jim Fish. He was an Indian guy that looked more white than Indian. We had a lot laughs together. He was like me, an Associate Engineer with similar duties. The interesting thing was about 90 percent or more of these engineers that were the top of the engineering field, they couldn't fix a Radio or a TV or their car which I thought was odd. They knew theory and application of Electronics but were not trained or skilled in trouble shooting or repair. They knew how to specify parts and understood the parameters of the equipment and could determine how to put new parts together but if it didn't worked they had a hard time figuring out how to fix it. They would leave that to the hands on Test Engineers and Technicians like me. Test engineers were guys that worked their way up as Technicians. But most of them were college educated with a background as ham radio operators when they were teen agers. Ham operators would make their own radios/transmitters from scratch in those days.

My boss asked me to make arrangements to ship one of the test console's to the cape in Florida. The test consoles are the size of a small car and weigh a ton. They cost about a \$100,000 dollars then, about a million bucks by today's standards. They needed it in two days. Well the shipping department said it would take a week to truck it there. I told the boss we could not meet the dead line and he told me to Air freight it then. We got the console there in time. Another console was shipped by someone else and it got lost for a month. It was found in storage in bldg 1 of the plant in El Segundo. They sent me there to check it out. The storage room was a ½ mile long and it was like a space museum. Well it was there next to a Para glider with a Mercury spacecraft attached. Ten years later I worked on this room when it was being prepared to assemble the B-1 bomber, small world. I shipped this lost console to proper department in Houston.

The cape was having trouble testing antennas. They need a rush solution. The Engineers in our group were top in their field of microwave for the Apollo program. They knew microwave testing like the back of their hand. They thought it was impossible and they did not know how to address this problem. I suggested the method we used at Compton to roll the consoles outside and test the antennas that way. My suggested as rejected by my boss because he had the correct solution. Our boss surprised us all. He said to build a Anechoic room with a bunch of Styrofoam pyramid cones attached to all the walls and paint the entire inside of the room black. We did this and it worked.



We were all amazed. Somehow our boss Walt Wyden learned and knew of stealth technology. This knowledge was way above top secret information then. Remember this was fifteen years or more years before we had built the stealth aircraft. I forgot about this until I learn of the stealth technology in the early 80's from David Kalil at Rockwell Microelectronics Division in Anaheim. He painted his car with stealth black paint he got from a buddy at Northrop Aircraft. The paint was used on the B2 stealth aircraft being built at Pico Riviera. He used it to evade traffic cop radar and it worked but the car looked terrible with that dull black paint.

### **All Things End at Work, 1969**

The Apollo 8 had circle the moon in December of 1968. The Apollo program for the employees was winding down and the actual flights had just started. Layoffs were starting in the late fall of and early winter of 1968 due to downsizing. As predicted I was the first to be laid off from engineering. I asked my engineer boss about the raise he promised me. He said the raise would follow me where ever I go at the same time he handed me my papers for demotion back to the bargaining unit. All the fellow engineers laughed and I was pissed at his statement but it turn out to be true. Raises did follow me where ever I worked. I was demoted from engineer to senior technician and got a 50 cent an hour raise in the process. Charlie Feltz-Chief Engineer for the Apollo program, who was over 20,000 engineers, was a person that I played chess with every day at noon when he was in Downey. Charlie told me he could get me another job in Apollo engineering in design. I did not have any experience in drafting and I didn't want to take advantage of Charlie- so I declined his offer. I told him that I would just be put back in the bargaining unit as a Senor Technician again, with a raise to boot. So I still had a job and I was okay with that.



A little information about Charlie-In chess I could beat just about everyone in engineering in bldg 6 except Charlie was a challenge. He was an excellent chess player- we were about in the same level in chess. It was nice recreation and I missed playing with





him at noon. But I moved on, after all it's just a game chess. I had bigger problems to face like hanging on to a job.

I met my section leader from that GSE group, Irvine Marine, three years later when I was in Facilities Engineering. He apologized for laying me off. He did not realize how much work I was doing until after I was laid off and gone. I told him not to worry about it. I was doing just fine and it worked out for the best. Amazingly it really did work out for the best.

The company was reducing 30,000 employees to 16,000. From the beginning of 1969 I was transferred every couple of weeks to a different locations, different Departments and different jobs. It was part of the layoff process within the Union. This was not a good thing for the Apollo program. I remember applying too much voltage high voltage for an insulation test on S band cables and dropping a computer used on the Apollo Command Module after I had tested it. I think this was happening because I was jumping around for so many different jobs, I was careless. I reported both incidents and still kept my job. The Flight computer was retested and found to be okay but the S band cables were replaced. Apollo 11, 12, 13, 14 and 15 were present in bldg 290 while I was performing some antenna tests on the command modules. To be honest I don't remember which bird other than the one in the photo on page one marked Apollo 15 4-1-69.



The way the lay off process works through our union is you replace the job of a lowest seniority person that is laid off. I was bounced all over the place and shifts too. I got to work on a lot of neat and strange Electronic check out equipment like DIT- MICO Wire Harness Tester and the Apollo computer checkout console. I met a lot of people I knew. It was depressing because you knew that you would eventually get laid off. I wanted to get it to get over with. I bounced around from Seal Beach to Downey then Compton than Downey again. Finally the layoff list had reached me. I was offered a demotion to Electronic Technician to keep my job or take the layoff. I refused the demotion and took the layoff instead. My logic was that all the good jobs in other companies would be taken before I got laid off if I waited. There was no lay off package deal. You were just out of a job with no pay. When you quite, there's a good bye party but when you're laid off you just leave without a party, bummer.



### **ITT Barton Instruments and The Apollo Landing**

I was laid off in from the bargaining unit of Rockwell in June of 1969 exactly 8 years from the date I started working for North American Aviation. I got a job a week later at IT&T Barton instruments as the R&D lab supervisor. I was still a professional and finally a supervisor too. My manager there was Bob Telmo.

I watched the Apollo 11 land from a TV set in IT&T Barton cafeteria on July 21, 1969. What a personal disappointment.



It was great the Astronauts made it and returned okay, but also a letdown because I was not at Rockwell to see it land from there. All those years and hours I worked at Rockwell to get that bird there and my final reward was to view the landing from another company. How ironic. But I did refuse another demotion to Electronic technician which would have prolonged my employment at Rockwell a little longer to be there for the landing. My logic again was that all the good jobs in other companies would be taken before I got laid off if I waited. A few months later I left ITT Barton and then worked for Genisco then I finally rehired to Rockwell Space Shuttle program

### **The Space Shuttle Program**

I went back to Rockwell in Nov of 1970 and told them I would work any job they had. I knew I could focus on my studies there and would be back on top when I graduated from college. I just expected a janitor job or something basic like that. I really lucked out. My affirmative action buddies in personnel (human resources) who included Roman Dominquez, helped me get back in. I guess what goes around comes around. I was hired in as an Associate Electrical Engineer working in facilities of Space Division in Bldg 1 of Downey. My supervisor was Dan Craigin, a Civil Engineer. The good thing about this outfit is Facilities employees were not subject to layoffs as often as the rest of the aerospace industry and they work very little overtime and also work day shift. The Apollo program was winding down and the Space shuttle was beginning. I started working in support of the Space Shuttle program in the early winter of 1970. This Engineering position was the best possible thing that could have ever happened to me - it was an epic moment in my career. I found my lucky star, but I did not know that then. Also, working at other companies made me appreciate working for North American Aviation or Rockwell as it was now called. The photo of me was taken in Downey bldg 290 (ATO) Electrical Room, the same building where I tested the Apollo's years before as a Technician.



This new job at Space division was very different from my prior background. For one thing I was required to design and draft. I was not that great at drafting in college. I did not know the National Electrical Code and I did not have any knowledge of electrical building drawings or building systems and components. For people in electronics, electrical power engineering is old time engineering and just boring. My background, training and experience were strictly Electronics and testing. Electrical Diagrams for Electronic

and Electrical are completely different to read. To the common person they look the same- just a bunch of cryptic symbols. But yes, they are different to people in both fields-but I lean in a hurry.

Wiring is coded differently. Black wires are ground and White wires are hot in electronics. It is the completely opposite in electrical-black wires are hot and white wires are neutral ground. Now I understand why so many people would get shocked touching our GSE consoles, the grounding was reversed putting the hot wires on the chassis. I told this to some of the GSE Electronic Engineers I used to work for to give them a heads up. Because of that I actually was instrumental in changing the way our GSE equipment was wired to power from then on.

I made a universal change to all equipment for NASA that used three phase equipment. I designed an automatic phase reversing relay system to match the phasing in different facilities when the consoles were plugged in. I discovered that half of Downey facility phasing was wired reverse from the other half of the Facility because they were fed from different Power Companies with different phasing. JSC, MSC and all NASA facilities were experiencing that same trouble. I remembered that from my background in designing power systems inside test consoles and working on facilities. The production engineers and the Facility engineers were going nuts trying to figure out the problem with power phasing in the plant. These guys couldn't talk to each other at the same level so I was a bridge between both disciplines- Electrical and Electronics. At the time I was taking a night class at Edison on power that included phasing. So the problem and solution jumped out at me. The VP gave me- a that a boy for the change.



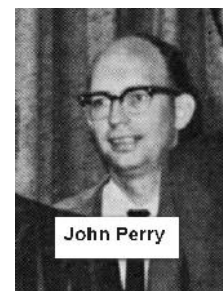
Walter Bloom

I started this position with a determination that I would master the skills to perform this strange new job. I knew how Rockwell worked; they would give me more than enough time to learn this job. They started me out on a job that required an electrical drawing plan of an electrical outlet

and its associated circuit breaker and panel. The lead Electrical Engineer, Walter E. Bloom showed me what the job and I was off and running. I learn very quickly from him and within weeks I was doing bigger more complicated jobs. I found this work to be easy. Management was impressed with how quickly I learned. Within a month I was doing all the same jobs that everyone else was doing in my group without any help. I really like this new work and I tried to learn as much as possible from electrical books, with discussion with other engineers and classes. The guys in the department like John M. Perry (Civil Engineer) help me along and were really nice to me. I really liked this position and group. This would be the same type of work I did for the rest of my life, but I did not know that at that time. After two years Walter Bloom left for Parsons Engineering and he was replaced by Earl Hunter. I learned a lot about this kind of work from both Walter and Earl- I owe them a lot. Rod Caveness the Senior Electrical Engineer in our group also did a great job with advice.



Rod Caveness



John Perry

was required to do

What I liked about my fellow engineers in facilities they would try to fix everything themselves at home. They would attempt to fix their cars and their TV and radio. But they weren't very good at it because they were not taught to trouble shoot and repair in college or anywhere in their training background and experience. They just tried by hit or miss.



Facility Engineering personnel have the run of the plant to do field surveys. I liked this part of the job because we were not confined to our desk like other engineering employees. We were permitted to go where ever the job was, which wound up being in every room, nick and cranny in our plants and in our facilities in Downey, Seal Beach, Compton and Palmdale. I got a lot of physical exercise that way.

We were now supporting the efforts to build the Space Shuttle. So my job now was to convert the facilities designed for the Apollo to Facilities for building the Space shuttle. Final assembly was now in Palmdale Air Force plant 42 B instead of bldg 290 Downey, I would travel to Palmdale for field work as the job required. Our Facilities Department got relocated a lot. Normally I was stationed at Downey and for a while at Seal Beach and Palmdale. I did that for five years.

### **College in fall 1970 Gonzalez and Licano**

I ran into some guys I knew from work and ELA College in the fall of 69 that were accepted in Cal State Long Beach. It was a nice surprise. Jess B. Licano and Joe Gonzalez were working at Space Division. Licano was from ELAC and majored in Electronics like I did there. So I knew him. Joe transferred in from Sul Ross State University, Texas. Now they were majoring at Long Beach State College in Industrial Technology just like I was. These guys were god sent; we would help each other in class, with home work and more importantly with moral.

I remember Licano from JC, he was quiet and conservative. I found Gonzalez had a lot of charisma and I like him immediately and I like Licano too. We had a lot in common. Going to Cal State we all became great friends and classmates. We were like the three musketeers. We wound up taking a lot of classes together.



I had an art class 330A called Industrial Design Technology with Joe Gonzalez in the spring of 1971. We did a project together about getting rid of trash. I produced 8mm silent movie and Gonzalez narrated the movie in class. We received an



A for the project. We learned to do free hand sketching with colored pencils of technical objects. I drew a record player, it came out nice. The guy that taught that class was a professional free lance Technical Artist making big bucks. I liked this subject and the instructor as well. I got a B there. We learn a lot in this class. The photo of Joe Gonzales is from 2014.

After completing the fall semester of 1970 my grade point average was 2.07. I was now taken off academic probation at Long Beach State and it was now all downhill for graduation.

On the last day of each school week Gonzalez, Licano and I would go to an Italian place called Jerry's Pizza in the City of Long Beach. A place by the college that we drank beer and ate a late

snack at night after classes, usually we ate anti-pasta salad. Later in 1971 we wound up Graduating together from Cal State Long Beach too.

### **Work Again**

At work, our group was making the drawing blue print plans to convert the facilities for building the Space Shuttle. For example, Air Force Plant 42B Assembly Building ceiling height in Palmdale was too low and the tail of the Space Shuttle would not fit. So we modified the plant by adding a section to the building with the height to accommodate the tail. The Palmdale plant was old so it needed a lot of retrofitting. The electrical service was increased and updated. A giant air compression the size of a travel trailer was installed to power all the air powered machine tools. The bridge crane wiring did not work so it was rewired. All the stuff in this building was old. I don't know when it was last used. A lot of it was from WW2. They had a WW2 aircraft Tower on the runway by the assembly building.



Work was started to rebuild this plant from the ground up. It was a major project. The taxiway was about 2 or three foot thick. We had to trench into that stuff to install the new underground Utilities. I put in a electrical service



that was huge. One of the circuit breakers was too small to serve the Air compressor so a larger one was installed instead. It was things like that; I was involved with on the Space Shuttle program. I did not work on the bird itself like I did on the Apollo. The work was still important because you can't have the Space Shuttle without a facility (building) to build it in.

I remember working on the Bridge Crane at Palmdale. This was different because I was taken up there on a man lift about three stories high. The lift is a little shaky so it takes a little while to get used to it. Actually I didn't get used to it at all. I found out that the Bridge motors had reverse polarity to the control transformer that why it did not operate. I didn't even know that they were polarized. So I learn something new. It was an easy fix once I knew what was wrong.

We used several engineering teams to design these buildings. The Engineer team consisted of an Electrical Engineer, Mechanical Engineer, Structural Engineer, Civil Engineer and an Architect. The Team had a team leader who was usually the Civil or Architect of the team. As the Electrical Engineer I was just concern with the electrical part of the job but I had to coordinate with the other Engineers to get my job done. I had to perform short circuit studies and do voltage drop calculations for each job. I made sure that the designs complied with the buildings codes.

The finished products were a set of drawings (blueprints) with diagrams and a set of specifications. Specifications are documents with instructions and part number's that the builders (contractors) must use to make the facility (buildings) and modifications to these buildings. The electrical plans consisted of a set of drawings with General Notes, Symbol List, Electrical Site Plan, Electrical building plans, Lighting plans, Lighting and Panel Schedules, Electrical Diagrams and finally an Equipment List. The finished documents and a Bill of Materials were sent to the Construction Department.

We didn't have computers then so everything was done manually. Calculations were made by hand instead of computers. Drawings were done by hand drafting instead of CAD (Computer Aided Drafting). Rockwell did not permit us to take photos so field sketches were used instead.

Dan Craigin was my Supervisor and Earl Hunter (he was nicked names Earl the Pearl) was my Section leader then. I like both my bosses and they both had Profession Engineering Licenses. Earl was also a licensed Electrician and taught me both Engineering and Electrician methods. I did some innovative things in this department and had several NASA technical brief published by NASA. Computer Rooms were a big deal then. In one of the NASA briefs I place moisture detectors under the raise floor Computer area which was new idea at the time. I also color coded the cables used for computer in that Area. I was told that our computer room in Downey was the largest computer room west of the Mississippi.

### **College Finally Ends 1972**

My last semester was that fall of 71 during night school. I completed my courses in Cal State Long Beach College, January of 1972 with a grade point average of 2.2. Not great, but good to enough for me to graduate, yea. I graduated from the University of California Long Beach in June of 1972 with a degree in Industrial Technology-Electronic Technology. I was so proud and also tired of going to college so long. I was glad it was over. Mission accomplished. I never felt like going to college ever again.

As a result of Graduating from College I was promoted in my department at Rockwell to Electrical Engineer. I had also been offered a job as a lab supervisor but the Facilities department countered with a position that had a higher classification than that so I was now a full fledge Engineer. The bad thing was I was an Engineer without an official Engineering Degree. I thought that holding an Engineering position would be hard to hold on to in the industry with the wrong degree. I found that my Industrial Technology degree with engineering experience was enough- I didn't know that then. So I was in for a penny, in for a pound as an Engineer. I was already doing Engineering so I embraced the work.





While walking around the plant near Building one in the yard in 1972 I saw our maintenance men cutting up an Apollo Heat shield bottom AFT section. They said that the heat



## Relocation of computer center in Seal Beach Saturn II 1972

[illegible]

one for each module console and handed them to each electrician. Boy I was tired-worked day and night and I slept in a cot in a hallway whenever I could. I connected all the equipment to one 225 amp electrical panel. I should have used three of these panels but the power for them was not available in that building. Luckily it didn't overload the system because the equipment was never running all together. With guessing and good luck it worked. We started on Saturday afternoon and finished Friday night, then I went home - Mission accomplished. It took one week after that to draw all the sketches onto official Rockwell blue prints.

### **Community Service:**

I became active in community then. Rockwell allowed me time to develop a program for the company to help young people in jail at Nelles School for Boys. This place was located next door to my house. The courts sent people in there that were from 18 to 21 years old. I helped train them for an occupation in industry. I was the coordinator for this program.

I taught a class to familiarize the inmates for employment. I set up welding classes with employees and equipment from Rockwell. It worked fine. I showed the students how to fill out a job application. I taught them to read charts to convert decimals to fraction which is important in a machine shop. I taught them things like common sense. It was simple things to make them marketable. It's funny; I could reach the black and white young men but not the Gang Banger Latinos. They considered their gang over everything. They were hard to reach. But I did reach a few of them anyway.

The program was a success. We had 98 percent of the people that went through the program never return there in a year. The normal rate from there was about 50 percent. The Principle said that he thought it was because the people entering the program were the best people at school. They never intended to return to crime. That was his opinion, not mine. I manage to get one black student a job at Rockwell as a welder. He told me it was best job he ever had and would not screw it up. He was still there three years later.

Being a minority I decided to promote NASA to hire a Mexican American Astronaut. I thought I could best do that marketing the idea by creating a picture. I got Rockwell to use one of the Company Artist to paint this portrait of the Mexican Astronaut. I envisioned an Astronaut and an Aztec with similar head gear with an Aztec pyramid, Observatory, Moon and statue in the background. The Artist (Alvarez) added the space Shuttle and the Mexican Olympics (1968) as an added touch. It was done for company PR purposes for affirmative action going on in those times. The other Latinos in the plant didn't think it was a good idea because there were no Mexican Astronauts going to space then. I explained that the seed had to be planted to get NASA to send a Mexican Astronaut into Space. The Painting was presented to the president of Mexico at that time (1972 or 1973). It was a good idea and it worked. The rest is history, a few years later



Mexican American Astronaut did get sent to Space on the Space Shuttle. Mission accomplished- So I did my ethnic thing.

Two years after graduating from college on November of 1973 I was promoted again. I was promoted to Senior Electrical Engineer. Another Mission accomplished. I was also given the Rockwell Space Division Exception Achievement Awarded by VP Joe Cuzzupoli with a 10 carat gold ring for my performance in the community and for my outstanding performance at work for relocating the Seal Beach Computer Center in one week. It was a great honor and they put my picture in the company paper. It was totally unexpected; I received the award for just doing my job. For various reason I decide to get some experience in the nuclear business and leave Los Angeles. It was a dumb idea.



### **Idaho 1975**

I was offered a Senior Nuclear Electrical Engineering Position in Idaho Falls for Aerojet Nuclear I worked there for a year and return to Rockwell B1 then to Space Division again in 1977. I Left the space programs in 1980 to work in other fields.

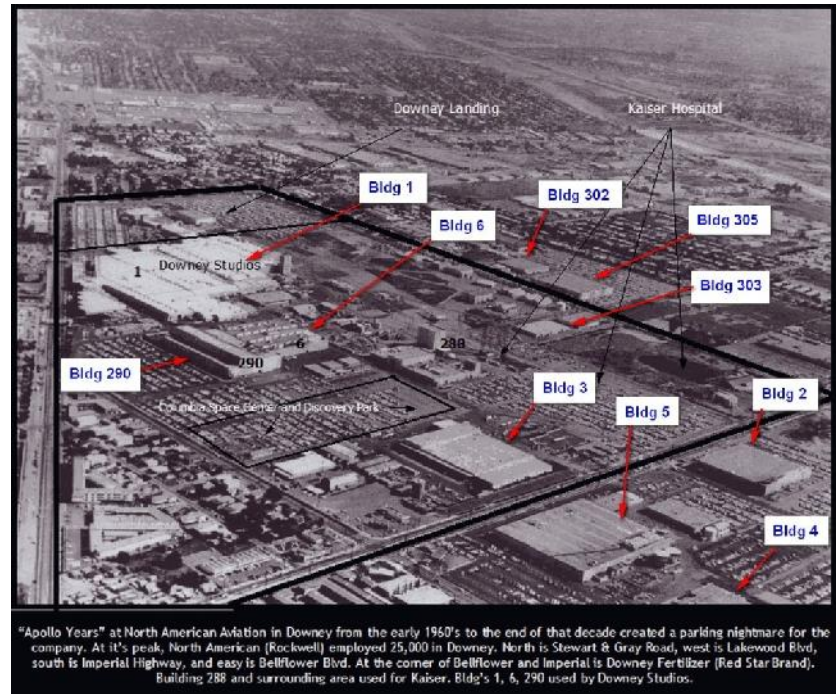
I received my Professional Engineering (PE) License on January of, 1996. I decided to start an Engineering business (Vidana Electrical Engineering) instead of working for somebody else. This worked out fine for me. I had my successful business in Las Vegas NV for ten years. I retired and ended my Business in 2005. I part time engineering temped for 13 more years and finally hung up my engineering career.

**Well this was way more than just a tale of bldg 290 but it was an interesting fulfilling experience for me. I added more bldg 290 photos to the end of this remembrance. Last Time I checked, building 290 and the S&ID facility in Downey no longer exist But I still receive a pension for my time served at Rockwell. Thank you for reading my story.**





Anthony D. Vidana



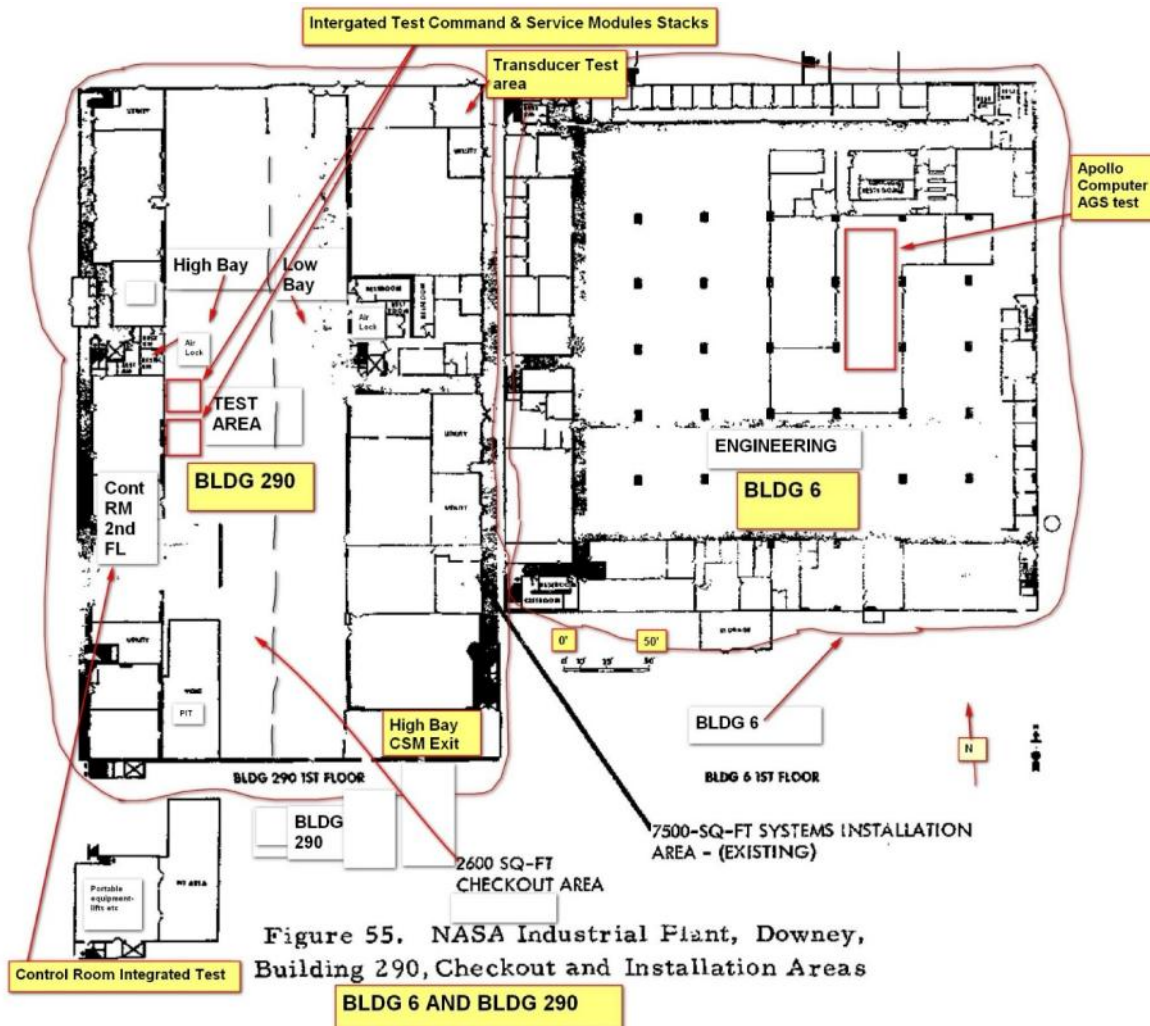
More On the Acceptance Checkout Equipment (ACE) known as the ACE Station.

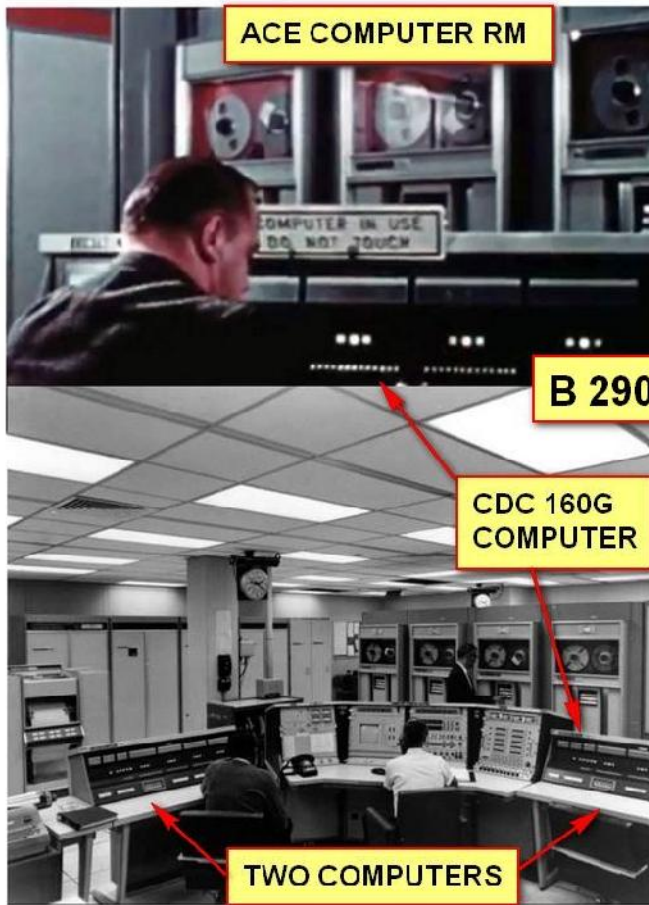
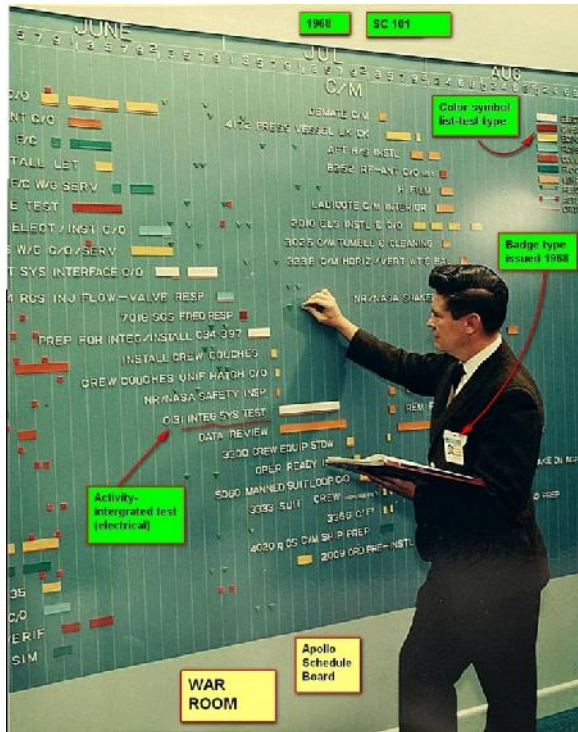
ACE was used to test the Bird at North American Aviation factory in Downey CA where the spacecraft was built. The test consisted of giving commands and monitoring the results. This was done automatically from a computer or manually by a person.

The Control Room was run by a main frame computer located in the computer room. The Control room had a grouping of consoles testing a system's like power and communication and many more systems.

The Spacecraft was mounted on an Integrated test stand we called Stacks. The stacks had cabling attached to the command module which was the cockpit of the bird. The cabling went to the Terminal room and from there it was connected to the Control room, Computer room and the Radio Frequency (RF) Room. The whole setup was called an ACE station. We had 3 Ace stations in Downey, 2 at MSC Texas, Three at Grumman factory in New York to test the Lunar Lander and 6 at KSC in Florida.

The ACE station in Downey was located in Bldg 290. The Ace stations were located on the 2nd floor and the Stacks (Integrated Test Stands) were located in the High bays. The Tech's shown worked on all the birds, they are typical of all the tech's that worked there.





USED ON STACK & CONTROL RM

PRINTOUT-OCP

OPERATIONAL CHECKOUT PROCEDURE

Stack Manager

DATA REQUEST FORM

CTC-Test Conductor

APOLLO-11

1. APPROVAL: [Signature]

2. REQUESTOR: [Name]

3. DEPT: [Dept]

4. PHONE: [Phone]

5. REQUEST DATE: [Date]

6. DATE REQ: [Date]

7. TEST LOG: [Log]

8. TEST DATE: [Date]

9. TEST TIME: [Time]

10. TEST NO: [No]

11. OCP: [OCP]

12. SEQ NO: [Seq No]

13. DATA TIME INTERVAL: [Interval]

14. REQUEST JUSTIFICATION: [Justification]

15. ACCEPTED BY: [Signature]

16. TYPE OF INPUT DATA

17. TYPE OF OUTPUT DATA REQUIRED

18. SPECIAL INSTRUCTIONS: [Instructions]







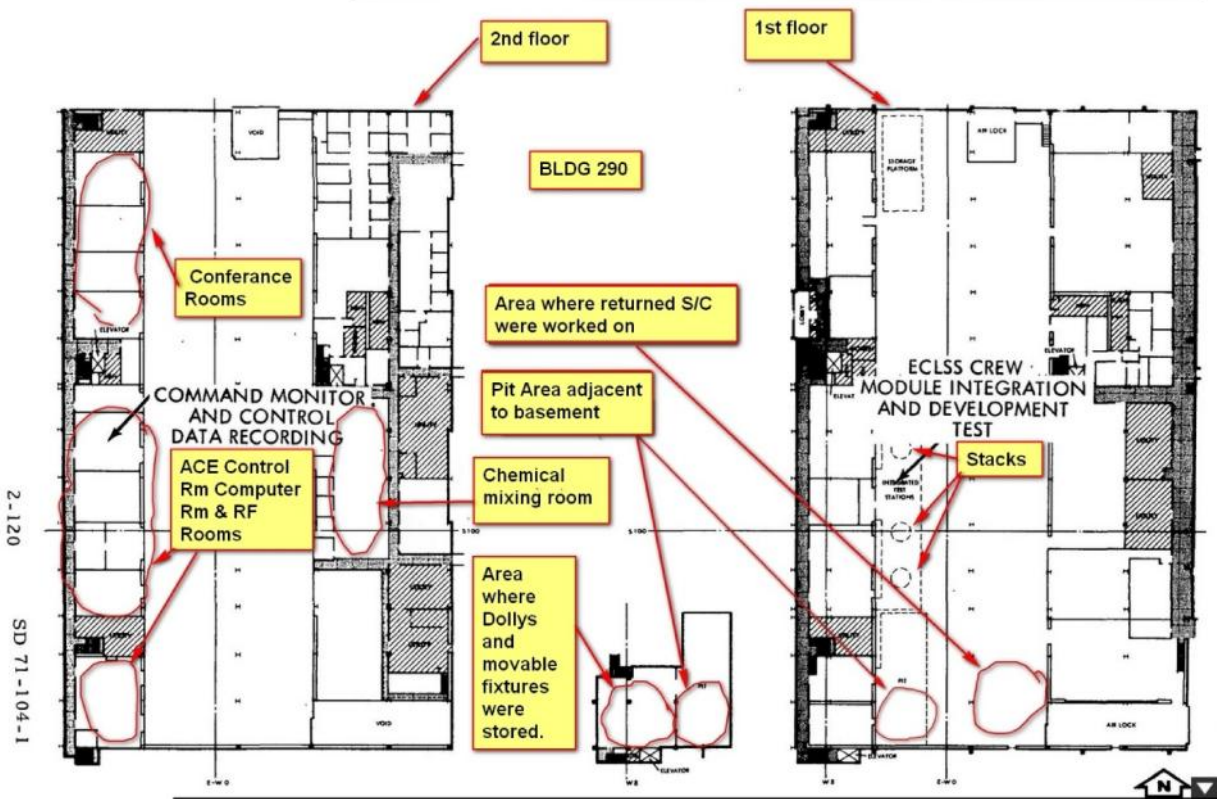
n





9.1.6.6 Systems integration and checkout facility.— An area of approximately 133 000 square feet was provided for spacecraft systems integration and checkout. The interior of the building consisted of four general sections. The sections nearest the east and west walls were of two-story construction to accommodate offices, assembly and maintenance areas, crib control rooms, servicing equipment rooms, and other general supporting areas. The center of the building consisted of a low-bay and a high-bay section. The ceiling of the low-bay section was 42 feet high, and the section had two 10-ton bridge cranes that traveled the full length of the building. This section was used for spacecraft installation, modification, and preparation operations. The ceiling of the high-bay area was 63 feet high, and the section had two 15-ton bridge cranes that also traveled the full length of the building. This area was used for individual systems check-out and integrated systems checkout after module mating.

The primary purpose of this facility was to provide an area in which temperature, humidity, and dust were controlled during installation and checkout operations to assure maximum reliability of the spacecraft integrated systems. Functions performed in this facility included final assembly of systems and subsystems, installation of these components in the spacecraft, individual systems checkout of the command and service module, combined systems checkout of the command and service module, test instrumentation installation, modification and updating to the latest design configuration, integrated test and shipping preparation.



Wednesday, June 12, 2019, 10:18:23 AM PDT, anthony vidana <advdana@cox.net> wrote:

Letter to Joe Gozales:

Well I posted the ACE video on YouTube. <https://www.youtube.com/watch?v=etsXEzWloc&spfreload=5> let me know what you think of it. I wrote out first part of the narration. I think that helped.

You know how it is when I worked the Ace I was in the test stands and didn't know what was happening. All the the control rooms,computer room and RF room were



secret, locked all the time. I did work in the control for one day for solving a problem they had on the ACE system connected to the command module. The Control Room supervisor there wanted to promote me. but my manager, not my supervisor didn't want that to happen. I don't know why he he had a hairuphis as about me getting promoted. So the dick put me on first shift washing the portable test stand in front the engineering office doorway at bldg 6. It was very embarrassing to have the control room supervisor go by seeing me wash the test stands. So when I finally got the interview I knew I was screwed.

As for the computer room I did not know that the mainframe computer was running all those consoles in the Control room. I knew there was a computer but I thought each console had their own custom computer. I did not realize that it was a giant main frame computer in a room full of tape readers and stuff using IBM punch cards. How primitive. How dumb of me too.

I was the experience electronics computer guy in testing in my crew. I was used as crew chief a lot because I knew the bird controls. The guy from the Control room never came to the command module so they did have a clue of test equipment used with the command module, Later on when I did get into GSE engineering I learn how little Engineers in general knew about hands on testing. . We had a Tech like that- he could not put two wires together without causing trouble so we called him Zero. These guys were kind of like that IT instructor we had at college. They knew all the technical stuff but could not fix their own TV set. Laugh out loud.

I found most of the testing involve with the ACE system on the internet later on when I was doing my remembrance. I found it was interesting so I decided to do a video on that. I left out all the techno babble technical information and just spotted the components of the ACE system with minor explanations. The ACE was actually quite impressive for the day. It would test every one of the thousand devices on the Apollo automatically. Our car computers do that now.

Tony