Space and Missile Systems Center
Los Angeles Air Force Base, California
SMC History Office Oral History Program

Interview With

BRUCE CUNNINGHAM

DOUGLAS AIRCRAFT COMPANY, EL SEGUNDO DIVISION

(Oral History No. 3)

A Navy A3D Skywarrior (left) and an A4D Skyhawk at the Douglas Aircraft, El Segundo Division, circa 1955 (Photo courtesy of the Museum of Flight/David D. Hatfield Collection via Katherine Williams)

FOREWORD

One of the oldest and often-used sources for reconstructing the past is the personal recollections of the individuals who were involved. While of great value, memoirs and oral interviews are primary source documents rather than finished history. The following pages are the personal remembrances of the interviewee and not the official opinion of the United States Air Force History Program or of the Department of the Air Force. The Air Force has not verified the statements contained herein and does not assume any responsibility for their accuracy.

These pages are a transcript of an oral interview recorded on magnetic tape. Editorial notes and additions made by United States Air Force historians have been enclosed in brackets. When feasible, first names, ranks, or titles have been provided. For the sake of clarity, the transcript was edited before it was returned to the interviewee for final editing and approval. Readers must therefore remember that this is a transcript of the spoken, rather than the written, word.

The information within this oral history interview is unclassified.

KNOW ALL MEN BY THESE PRESENTS:

That I, Bruce Cunningham

have on (date), 20 June 2001 participated in an audio/video-taped interview with Robert Mulcahy

covering my best recollections of events and experiences, which may be of historical significance to the United States Air Force.

I understand that the tape(s) and the transcribed manuscript resulting therefrom will be accessioned into the United States Air Force Historical Research Agency to be used as the security classification permits. It is further understood and agreed that any copy or copies of this oral history interview given to me by the United States Air Force and in my possession or that of my executors, administrators, heirs, and assigns, may be used in any manner and for any purpose by me or them, subject to security classification restrictions.

Subject to the license to use reserved above, I do hereby voluntarily give, transfer, convey, and assign all right, title, and interest in the memoirs and remembrances contained in the aforementioned magnetic tapes and manuscript to the Office of Air Force History, acting on behalf of the United States of America, to have and to hold the same forever, hereby relinquishing for myself, my executors, administrators, heirs, and assigns all ownership, right, title, and interest therein to the donee.

Unrestricted Access for all military personnel and civilians except for information that is classified or deemed subject to Privacy Act restrictions by appropriate authority.

DONOR Bruce Cunningham

DATED 22 June 2001

Accepted on behalf of the
United States Air Force
History Office

BY Robert Mulcahy

DATED 20 June 2001

SPACE AND MISSILE SYSTEMS CENTER (SMC)
LOS ANGELES AIR FORCE BASE, CALIFORNIA
SMC HISTORY OFFICE (SMC/HO) ORAL HISTORY PROGRAM

Douglas Aircraft Company, El Segundo Division Oral History (No. 3)

INTERVIEWEE: **Bruce Cunningham** (1928-)

INTERVIEWER: **Robert Mulcahy** (SMC/HO Historian)

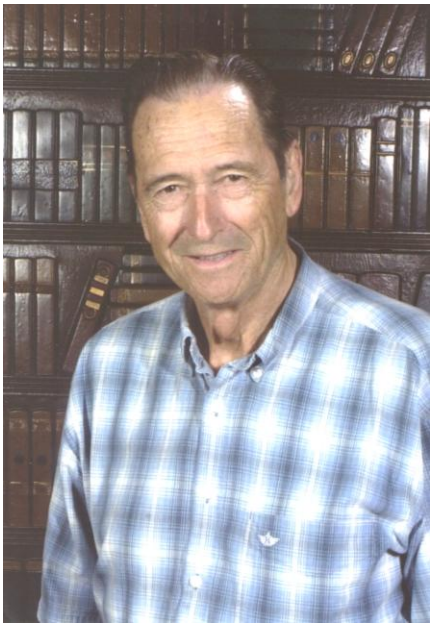
SUBJECT: Engineer at the Douglas Aircraft Company, El Segundo Division

SUBJECT TIME FRAME: 1953-1961

DATE OF INTERVIEW: 20 June 2001

INTRODUCTION

This is Robert Mulcahy of the History Office at the Space and Missile Systems Center (AFMC) at Los Angeles Air Force Base (AFB), California. Today's date is 20 June 2001. I am going to interview Bruce Cunningham of Huntington Beach, California about his experiences working at the Douglas Aircraft Company's El Segundo plant where Area B of Los Angeles AFB is currently located. We are conducting the interview in the History Office of Los Angeles AFB.



Bruce Cunningham on 20 June 2001.
Cunningham was a Douglas engineer at El Segundo from 1953-1961.

INTERVIEW

Mulcahy: Mr. Cunningham, how did you get hired at the Douglas El Segundo plant?

Cunningham: I'd finished my education at the Northrop Aeronautical Institute [in Hawthorne, California] and then spent sometime in Korea. I started looking for a job in early 1953. There were no jobs available, so I toured the local aircraft factories on a weekly basis. [I] happened to walk into Douglas Aircraft Company one afternoon and, unfortunately for the engineer but fortunately for me, one of the liaison engineers had passed away of a heart attack. I walked in the door when they needed an engineer. They offered me the job and I took it. I started March 24, 1953.

Mulcahy: When did you stop working at the Douglas El Segundo plant?

Cunningham: It was in June of 1961. We finally closed down the hangars and I was transferred to the Long Beach [California Douglas Aircraft] facility.

Mulcahy: Please describe your job at El Segundo.

Cunningham: When I first hired in, I was in the "pots and pans" area, the sheet metal parts and small subassembly areas. As a liaison engineer all the damaged, malformed, mis-installed parts in assembly were submitted to me for either repair, scrap or redesign. My job was to save as many of the damaged or mis-made parts so they could be used rather than scraped.

Mulcahy: How long were you in that position?

Cunningham: I started on March 24, 1953. I was transferred down to the production line in April 1953 on the second shift. I worked as a liaison engineer on the finished product of the AD-5 [Skyraider] and AD-6 [Skyraider].

Then I was over in what we called the "slot," which was a development area for the turbo prop A2D [Skyshark]. That airplane didn't go. They built 12 and they had some prop gear combination problems. That A2D collapsed of its own weight and never went. I thought it would have been a great airplane had they gotten the problem secured, but the Navy decided to go with the A4 [Skyhawk] and they cancelled the A2D contract.

Mulcahy: How long did you do that job?

Cunningham: From about April of [19]53 until October [19]53, at which time I was sent out to a little building across the street called "Interstate" [Interstate Aircraft Corporation] where they were building the AD-6 fuselage assembly prior to sending it back over to the plant for assembly with the wings. I was

there at Interstate from October until February 1954. In February I was transferred to the flight line, still on second shift.

Being around a lot of aircraft at the hangar was my goal, as far as I can ever remember. There were two of us on second shift, my boss Ray C. John and myself. He said, "I'll take all the prop-driven airplanes. You're going to be in charge of engineering on the jets." The first jet we had over there was the A3D [Skywarrior]. I followed the A3D throughout its manufacturing life at the plant.

The Douglas Aircraft, El Segundo Division, circa 1955
(Photo courtesy of the Boeing Company via Patricia McGinnis)

Mulcahy: How good of an airplane was the A3D?

Cunningham: Excellent! It was a great airplane! It was basically used as a deterrent during the Cold War. It was a long-distance, heavy bomber, the heaviest bomber that's ever been put aboard an aircraft carrier. It was designed specifically to go on board an aircraft carrier, and also designed specifically to

carry the "Fat Man" atomic bomb. In fact, they enlarged the bomb bay slightly to take the Fat Man, which was about a five-foot diameter bomb at that time.

At that time, aircraft carriers were straight deck and narrow, and yet the A3D was put on board those carriers and performed well. It was a great airplane. In fact, the A3D is still flying today in civilian ownership. There were some up at Van Nuys [California] that the old Hughes [Aircraft] Company used to have. The A3D is still flying test, because they haven't got an airplane that can do the particular test they're doing.

Mulcahy: What did you do at El Segundo after your flight line assignment?

Cunningham: When I went to the [B-3] hangar, I was a liaison engineer there until June of [19]61. Prior to leaving the plant and being transferred to Long Beach, I was assigned to the production flight test division, not permanently, but only for flights.

We were making production flight tests of every airplane that flew. If there were single-seat airplanes, only the pilot went. The A3D is a three-man airplane. I usually rode in the third seat in the later part of the production cycle and checked out how the airplane reacted in flight. We would decide what to fix when they found something wrong with the airplane, however minor or major. I would be assigned the job of determining what to do about it, troubleshoot systems that didn't function, and any other repair. We would then go back and fly it again.

When we delivered the last airplane at El Segundo, in about 1960, we still had some modification programs at the hangar. That's what we called "Location B-3" hangar. We were putting an antenna on the wingtip of the A4, but I never did find out what it was, some antenna that some electronics wizard had dreamed up. The Navy would fly the airplane in, we'd put the antenna on, and they'd pick up the airplane and take it away.

At that time, we were so short of people at El Segundo. I was the only engineer. I was around the flight office. I was the radio operator and dispatcher for the aircraft. Another gentleman in production (Marvin Shaha) controlled the aircraft. He'd bring them in, park them, tow them, service them, fuel them, put oxygen in them and depart them from the flight line.

Mulcahy: Were you a member of a union at El Segundo?

Cunningham: The engineers had a representative group but not a union. The production people had their union. The engineers had an association, the SCPEA (Southern California Professional Engineering Association), which really didn't have a lot of strength, but it represented a lot of people. Douglas,

being the way it was back in those days, would listen to the people who ran the association when we complained about salaries and such things as a union would complain about. The association would represent all the engineers in the plant. It was not really a union. It was an association. I wasn't in it very long, because I went on salary. I had to drop out of everything when I went into management.

Mulcahy: Did the El Segundo plant operate 24 hours a day at that time?

Cunningham: No. They ran two shifts, the day and the night shift. The third shift had guards and maybe a few necessary maintenance people, but it was normally a two-shift operation the whole time I was there.

Mulcahy: How would you describe the working conditions at El Segundo?

Cunningham: For me, perfect. I got to work around airplanes and fly on airplanes which has been my life. As far as the treatment of the personnel in engineering, we were shown all the respect that any engineer would be shown.

Manufacturing would listen to us, and that's hard to put up with sometimes. They don't understand engineering. When an engineer spoke and signed a document saying, "This is the way we want it done." That's the way it was done. We had the authority to do that. We were not bowed to, but we were treated with the proper respect of our position. I think Mr. [Donald] Douglas [Senior] himself brought that into the plant when he built it. Everybody had a great respect for Mr. Douglas.

I spent as many as three days and three nights straight without ever going home working on some programs that we needed to get done. I would sleep in the flight office for a few hours, and then go back and work on the airplane or whatever we were doing. To me, that was part of the normal function of my job. I enjoyed every minute of it! The El Segundo plant was one of the greatest places I ever worked.

Mulcahy: Were the facilities at El Segundo adequate for the large numbers of aircraft produced there?

Cunningham: Absolutely! Crowded at times. Through my tenure there, we were building the A3D, the A4D, and the F4D [Skyray]. The A2D and the experimental stuff also went through there. The plant being the size it was, it got crowded, but that didn't mean the aircraft quality deteriorated, or the way they treated us.

After I had joined the company, World War II had been over for quite sometime. We had a lot of contracts. We subcontracted a lot of the work out there. We had sections of the aircraft and wings being built up in northern, central

California. [Douglas Aircraft at] Torrance [California] was building the AD-6 fuselage to start with. A lot of fairly good-sized subassemblies would come in for assembly at the El Segundo plant. We built the first of a model (like the F4D) out of the experimental shop at El Segundo, but once we got into production, we farmed it out as much as we could.

In fact, the F4Ds were totally built at Torrance. They had a long two-level production line at Torrance; one level walkway went around the upper part of the aircraft and the other was down below the aircraft. The total airplane was built there, the wings were built there. The F4D was assembled at the Torrance location and moved to B-4 (Douglas El Segundo location at Los Angeles International Airport [LAX] west of Pacific Coast Highway) on specially-built semi-trailers.

Mulcahy: What was the general process of producing an airplane from scratch to delivery at El Segundo?

Cunningham: I never got involved in that, but from my experience in the main plant, the north side of the firewall was offices, engineering and all of the subassembly stuff. South of the firewall, they would start putting the airplane together in the jigs. They'd bring the pieces in [the] assembly [area]. As they moved them down the line, the pieces would grow into an airplane.

All the pieces would go on at certain sections down the production line. Preplanned programs and preplanned positions installed instrument panels and other equipment such as radios, guns, bomb racks, etc. All those would go on at certain positions on the line. When you started out back at the firewall, you'd see maybe a fuselage and a whole bunch of pieces lying around it in bins and stockrooms. As I recall, when they came out of the door at the end, they were complete airplanes, including the A3Ds. That's a large airplane to go down that building.

Mulcahy: Would the airplane then get painted and flown?

Cunningham: Yes. It would be painted. In fact, most of the parts and assemblies were already painted. We would paint touchups wherever we needed them. When the airplanes came out of the back door, if there were part shortages (and there were part shortages in that time) they'd just park them in the big lot in the back [west of Building 229] and finish the work down there. They moved the airplanes on wheels. In fact, some of the time we were short wheels and tires. We would roll them out on non-flight worthy wheels and tires and put them on the back lot. People worked out there putting on the missing pieces and the final touches on the airplane.

When the production assembly was finally done on the A4 and AD type aircraft, the [aircraft] guns were bore-sighted and fired in the gun-pits. Aircraft would

then be towed across Imperial Highway over to the B-3 hangar for engine run and flight. The engines were not run on the south side of Imperial. Engines were not started until the airplanes were pulled across the street from the Douglas plant where they had blast walls. They had sound suppressors for the different airplanes.

The A4D final assembly line on 3 March 1955. This building is currently (2001) the base Fitness Center (Building 242). The A4D is probably the only aircraft that was assembled at Los Angeles AFB. (Photo courtesy of Boeing)

Mulcahy: How many different buildings would an airplane pass through during its production?

Cunningham: From my experience here at the El Segundo plant, one, other than the B-3 hangar. The subassembly pieces would be brought into the main building from wherever they were made and assembled there. The pieces stayed in that long, long production line all the way down as they were assembled. Then the airplane went out the back door to the flight line, and sometimes into the hangar for whatever reason they needed. Most of the time, the aircraft at the flight line were outside. We generally didn't put them back into the building. They were fueled, had engine runs, and had the engine checked out. The only reason an airplane would be back inside is if it had some major work to be done.

Mulcahy: Were the airplanes transported with a tug from one area to another?

Cunningham: Yes. The F4D came up from Torrance on trucks. They had specially built trailers to support the airplanes on their own wheels. They'd lift the F4Ds, put them on a truck, and they'd tow them. The truck would bring them here. From the main plant here at the El Segundo location, the aircraft would be towed by tug down the back lot out on the street and across Imperial and never be on the vehicle [truck] again.

Mulcahy: Typically, would an airplane go from the production building, to the paint building [Building 219], to the gun pits?

Cunningham: The pieces were normally painted when they came in, because they were all Navy blue [or sometimes white – A4D]. If they were external parts of the aircraft they would already be painted Navy blue before we assembled it. It would all be from the same color paint. They all looked as if they'd been painted. The only time we ever did any painting, was if we had to take a new part that had not been finished and had not been painted, but that was not very often. Until A3Ds came along, I think we painted those down there, but I don't recall a paint shop large enough to put those big airplanes in. Most of them came in already painted.

Mulcahy: About how long would it generally take to build an airplane?

Cunningham: Now you've got me stopped. I don't recall. I was on the production line (in the slot) in the main building where they developed the A2D Skyshark. By the way, we had two or three airplanes down there we were developing, so they don't count as "production" airplanes. If it didn't work, we'd try something else with the designers. With a development job, it took months or a year.

I don't recall the speed at which the production line built them. The speed depended on the delivery rate that the Navy wanted. We could slow it down or speed it up. If you wanted the airplanes in a hurry, you could go in two or three shifts, add more people, get more work done. If the Navy didn't want the airplanes that fast, or they wanted maybe one airplane a week, you took people off a job, put them someplace else, and just moved the line slower. It all depended on what the Navy wanted to pay for and how fast they wanted the airplane. If the Navy wanted the airplanes fast, I would guess we could have put an AD down through the line in maybe three weeks. This is while not knowing how long it took the subassembler at companies to build a wing, or a horizontal stabilizer, or elevators, or ailerons, or whatever goes on it.

The A3D is a lot larger airplane than the AD. It never really got into that high rate of production. We had the A3D going out of the hangar at probably two a month during the final delivery. I have some dates at home on all our delivery dates.

The first flight of the A3D was in [19]52. We built them until 1960. I think we built 356 of them, probably at the rate of two or three a month. At the most we maybe did one a week, but that doesn't mean they were in the production line for just a week. They were coming off the line and starting a new one once a week or every two weeks. In total assembly, the A3D took about a month. That's just a guess, because I was not in that area while they were building the A3Ds.

I wasn't there long enough to know the production rate of the ADs. I left the plant and went to Interstate across the street. They were building fuselages, and they turned the ADs out in four or five days, as long as they got the parts. They'd just take the fuselage and shove it out to the plant, put a new AD in a jig, start another one, pull it, and sent it to the plant.

Mulcahy: Which facility was Interstate?

Cunningham: Interstate was located on Imperial Highway adjacent to the Douglas Aircraft Company in El Segundo. That company occupied a huge Quonset hut-type building where they built their Model S-1 Cadet [airplane] from 1940-1942. Then they moved their factory to Los Angeles. In 1945, the company abandoned the manufacturing of aircraft, but continued producing their line of Interstate Vacuum Cleaners. Interstate [eventually] moved out, and Douglas took it over as a subassembly building.

Mulcahy: What types of production line transitions were made when an assembly line stopped building one type of aircraft and started building another?

Cunningham: They ripped out the old tooling, and built tooling that would hold what [airplane] they were putting in there. So you'd just demolish it, or cut it up and store it someplace. Remove the tooling, because the tooling is super-critical when you go into production. Some of it is pretty large steel tubes, six-inch diameter steel tubes, so that nothing moves around when you were driving rivets in the part [panel] you were working on. Every rivet went in the same place. Every subassembly went into the same tooling hole.

You'd get the tooling out and put new tooling in before you could ever put the first subassembly on. You had to sweep the place clean, so to speak, and then start over with all new tooling, because no two airplanes used the same tooling; no two models of airplanes used the same tooling. Generally speaking, they had time to do that, because designers were still working on the final designs of the aircraft. Tooling and planning would put their paperwork together to design what they wanted to do and what sequence they wanted. Then tooling people would start building tooling. That could take six months or more, just to get the tooling put in the right place and solid so it wouldn't move around.

Mulcahy: Who trained the production line employees how to make the new airplane?

Cunningham: The designers would put their work on paper and give it to the planner. The planner would say, "Ok. We'll put out [the part that is designed on] these pieces of paper." Every part had its individual piece of paper about how to build it, make this die, make that tool, shape it this way, stamp that way, heat treat it this way. All those things would be done on planning paper, and manufacturing people would do the work. Engineers would not see too much of

that except early in the game. They'd come down and see what their parts looked like, and see if they were going together right, but once they designed it, somebody else took over the building of it.

A good designer was always interested in his product, how it worked when he finished it, and how it went together. Could he improve it for use in the field? Many times the manufacturer would go back to the designer and say, "Can you redesign this so we can build it simpler?" That was one thing Douglas was famous for: ease of manufacturing and assembly. That included access for maintenance, manufacture and assembly.

Mulcahy: Did the completion of the Korean War decrease the airplane production at El Segundo?

Cunningham: I went to Korea. I was a Second Division aircraft mechanic in the 37th Field Artillery section. We were supposed to have two L-19s [Mountaineer], but we had one. They cracked one of them up before we got it, so we had one airplane supporting the artillery.

When I got back from the Korean War and was hired by Douglas, we were building the AD-5 and the AD-6 on the production line. The A2D was in the development slot. We had two or three airplanes down there in development. The A4 was in design and came down on the line for manufacture. The F4D and the A3D were in design at the same time. We were probably producing the majority of Navy's aircraft between 1953 and 1960. Then all our contracts started going downhill, and the Navy started looking at other companies to build their airplanes.

Douglas was never famous for stepping out in front. For instance in the supersonic area, the F4D was supersonic only at altitude and only in afterburner. It would fly maybe Mach 1.0 or 1.1 straight and level with the afterburner. It was a fully hydraulic (all the controls and actuators were hydraulically powered) airplane and that was a radical departure from the normal Douglas airplane.

Ed Heinemann (who was our chief designer at that time) basically did straightforward aircraft design. The other companies were starting to come out with supersonic stuff in the [F-4] Phantom and all the other high-speed stuff that was coming out. When those started coming out, then the Navy looked at other companies for their airplanes, and they didn't want that many types of airplanes. The Navy was [previously] looking for more than one kind of airplane, so we were putting out four, five and six different models. As those airplanes phased out, we finally closed down the El Segundo plant and went to Long Beach. The only one that really remained in production was the A4D and that went to Palmdale [California].

When they shut the El Segundo plant down, there was no production going on there. For about eight months to a year we were just doing modification work and closing down the plant in sequence. Phased the airplanes out. They had already moved the A4 to Long Beach and Palmdale. The manufacturing and assembling went to Long Beach, and the flight part went to Palmdale. They trucked the A4s up to Palmdale in specially built trailers. Everything that went on the A4 would fit into little niches on this trailer and then they hauled it up to Palmdale. They would finish building and assembling the A4s there. At one time, they had a production line up at Palmdale to put those things together.

Mulcahy: Do you know if the Douglas employees at El Segundo were exempt from conscription during the Korean War?

Cunningham: No. They were not.

Mulcahy: Was the A4D the last airplane produced out of El Segundo?

Cunningham: We considered Palmdale a part of El Segundo at that time. The A4 had gone to Palmdale. Right along the same time, the A3 was probably the last production airplane to go out of El Segundo. I believe the A4 moved out to Palmdale just before we finished the A3 contract and shut down the plant. We were supporting it.

I'd gone up to Palmdale several times, because I was in charge of engineering at the B-3 hangar in liaison engineering. I spent some time at Palmdale. My boss and two other engineers spent a lot of time up there trying to get those airplanes [A4Ds] ready to fly. All the activity was up there by that time.

Mulcahy: What was the process of conducting a production flight test after an airplane was manufactured.

Cunningham: The chief pilot assigned the pilots and the aircraft. The first thing the pilot did, of course, was find out what the airplane was like on the ground before it went up. How many squawks did it have? How did it react? Did it have an engine problem? Have they had any problems with this airplane?

The pilot would do an engine run-up when he got in the airplane. He'd do his own preflight, check out the engine and taxi the aircraft. Then he would take off and fly a predetermined flight pattern, do stalls, turns, see how that aircraft trimmed out, how the engine ran. The pilot would do all the things that he would expect the Navy to do other than land aboard a carrier; we didn't do that in production test. He would test the aircraft and approach the boundaries of the expected envelope, top speed, dives, G-loading, rate of roll, all the things that the Navy would be doing with the airplane.

I was on the A3D and did the same thing. We'd look the airplane over. I'd usually be around the airplane all day long before we flew it. I would spend a lot of time looking at the airplane, and checking with the mechanics to see what they had seen on it. The pilot would also do that if he felt like it, but most of the time they didn't. They didn't know the mechanics well enough, but the pilots knew the quality of workmanship they were getting.

An A3D (Navy blue) and an A4D in the Douglas B-3 area at LAX, circa 1955. (Photo courtesy of the Museum of Flight/David D. Hatfield Collection via Katherine Williams)

We'd preflight the airplane, take off, and head out for the designated flight test area. It was out of the way of airliners and private aircraft, usually over Edwards [AFB, California] or out over the ocean. We would go through all the functions that the airplane would be expected to do in flight, including radio and electronics. We would write up squawks if the airplane didn't trim right, if it didn't climb to the rate it was supposed to climb, or if the engine didn't perform the way it was supposed to perform. All these would go down as flight squawks.

When we came back to the hangar, it was my job to review all the flight squawks and determine what was to be done, if it needed engineering. A lot of the times it was, "Replace that black box. Replace that radio." Something like that which didn't require any engineering. It was just something malfunctioning. My function as an engineer was to decide what to do about a trim squawk or some such thing.

Then we'd go back and fly the airplane again. After that was done, if the pilot felt the squawks they corrected were minor enough, he'd say, "OK. You've got those fixed to my satisfaction. We won't fly this airplane again." Normally we would re-fly the airplane. In some cases there were airplanes in fairly good

shape and in excellent shape that maybe had some minor squawks. You'd say, "OK. You got those squawks done like we asked you to. I know what will happen. We'll turn the airplane over to the Navy."

The Navy would come in and do the same identical thing. They'd go out and do the same flight test within the envelope and write up the flight squawks. We [Douglas] would then receive those Navy flight squawks, because they were still our airplanes. The Navy had not accepted the airplane yet. The Navy went on their own test flights.

When the Navy was satisfied the airplane met their requirements they'd sign it off and say, "OK. Navy acceptance is on this date." Then the Navy waited until they got ready to deliver the airplane someplace. I don't think we ever got an A3 out of there in less than two company flights. Sometimes there was one Navy flight, but more a lot of times. The Navy liked to fly the airplane.

We had a Navy commander [O-4] at El Segundo who was an acceptance pilot. They liked the A3D. It was a nice, comfortable flying airplane. It was a fairly forgiving airplane. It had aerodynamic control slats on it; if they malfunctioned you could get into some troubles. It was a pretty good airplane.

A Douglas A3D-2P Skywarrior on 29 July 1959
(Photo courtesy of Boeing Company via Patricia McGinnis)

Mulcahy: How long would a production flight usually last?

Cunningham: Probably up to two and a half hours. Just going through the long list of things that he had to do and check off, to make sure they were right. You didn't go up there and just do things. He [pilot] went right down a checklist. As

he went through this checklist, if it worked, then he would just check it off. He had to do it anyway even if he said, "Well, I never had a problem with that." Do it anyway, because it may happen on this airplane. The whole checklist on the first flight probably took two, two and a half hours of flying.

Mulcahy: Once the Navy approved an airplane, would one of their pilots then fly it from LAX to a Navy base?

Cunningham: They would send a delivery pilot out, unless they used the Navy pilot we had here. They'd send a crew out to fly it to wherever they wanted to go. Usually they start off back at Patuxent River [Naval Air Station, Maryland] and then they'd go to Florida down to the VAH-1, VAH-3 squadrons down there. Usually, the Navy had their own pilot.

Mulcahy: About how many Navy pilots were assigned to the El Segundo plant?

Cunningham: At any one time? One. Now, that's when I was at the [B-3] hangar. We only had one, because we only had the A3. The prop jobs were starting to phase out, so they were only running the A3s when I was there.

Mulcahy: They had one Navy pilot per airplane type?

Cunningham: One Navy pilot in charge of the flight office. He may have had one or two sub-offices doing some of the flight testing. Yes. When I was flying, if I flew with the Navy, there was always a commander who flew the A3D.

Mulcahy: About how many production flights would usually take place at LAX in a day?

Cunningham: Anywhere from zero to maybe six. It depended on the number of airplanes that were ready to fly at any one time. We had a stable of pilots there at one time. At the most, we probably had six pilots assigned to the El Segundo plant. They were in the process of flying and advising engineers on problems that they were running into and training.

Mulcahy: Was there a particular procedure that was difficult or dangerous that you had to conduct during a production flight?

Cunningham: No. A lot of the guys were afraid to fly, but that's not considered dangerous in my mind.

I love flying. In fact, because the A3D was a new airplane we were flying, we asked the company if they would send us to parachute school to make one parachute jump in case we ever had to do it. They thought it might not be a bad

idea, but then somebody's lawyer got in the act. He said, "No. If anything happens…" So, we didn't get to do that.

We did all the emergency stuff. We blew the lower door down on a couple of flights just to test it. The A3D had an explosive charge that blew the lower door, which is part of the outside fuselage trim. That blows the door down and there was a slide that slides out of the door.

As far as danger… No. In fact, we never even came close to that.

Mulcahy: Did any of the El Segundo airplanes ever crash while you were there?

Cunningham: Not in production test. No. In experimental flight test? Yes. We lost two A3Ds. We lost a couple of F4Ds. I don't recall that we ever lost any A4s**.**

Pete Colopietro had to "punch out" [eject from] of an F4 over the ocean. He didn't know how he got out or how he pulled the parachute, because both of his shoulders were dislocated. They never let him fly again after he recovered from that.

Roger Conant was my pilot. He was an F6F [Hellcat] ace in the Marine Corps who shot down six enemy airplanes. The story goes that Roger was up in an F4D when Pete had to punch out. Roger found Pete, and Roger's F4D had drop tanks on it. Apparently, he either saw Pete go in or found him out in the ocean. The story goes that Roger dropped his fuel drop tanks to mark Pete's location. Somebody went out and rescued him in a boat or whatever. I heard that the Navy tried to bill Roger for the two tanks he dropped. Roger said it wasn't true, but I heard that story so many times. It's probably not a true story. Somebody may have dreamed it up.

Mulcahy: Was production flight test considered a very hazardous job?

Cunningham: No, not really. Experimental flight test was a hazardous job. That's where you could make it or get killed.

In production test you got an envelope to fly within so much airspeed, so much altitude, and so many Gs you pull on the airplanes. There were limits, and the production pilot flew the airplane within those limits. The experimental test pilots were the ones who took the first models up and went out to find those limits. We lost two A3D pilots when the tail came off, and that called for a redesign of that attachment of the horizontal stabilizer to the aft section. [James] Verdin, I believe was killed in an A4D flight test accident. We didn't lose that many pilots, fortunately. The A3D was basically a well-designed aircraft to start with. We were not in the ultra supersonic range. It was just a new airplane and different.

Mulcahy: How did LAX feel about production flight tests being conducted at the airport?

Cunningham: Initially, we didn't have any problem, because there wasn't that much activity there. Eventually, they started complaining when the [Douglas] jets came in. The noise was bothering the neighbors. This was before the commercial airplanes and airlines had jets.

The Navy (being military and government) had priority on everything going in and going out of LAX. As the airliners started coming in… The potential for accidents on a military aircraft is higher than a commercial aircraft, just by nature of the beast, so to speak. They [LAX] kept working with us. Finally, we told them the plant was going to be closed down anyway in about 1960. You don't see military airplanes going to LAX anymore, except maybe a president's airplane or such as that. LAX really didn't like us there, because it was not considered as safe as a commercial airplane, and probably wasn't. They didn't design those airplanes to be [as] safe. They designed them to perform a military function. I never got directly connected with that. I just know LAX didn't like us there.

Ed Heinemann (right) being awarded the Collier Trophy from President Eisenhower in 1954 for designing the delta wing F4D Skyray.
(Photo courtesy of the Boeing Company)

Mulcahy: Please tell me about Ed Heinemann.

Cunningham: I probably heard of Ed Heinemann the second day after I was hired. Ed Heinemann was a genius in his own right. He was not [a graduate of] one of the recognized, quality, socially-accepted colleges as an engineer. He was a self-taught engineer, so to speak. He'd gone to school, of course, but he still had his own ideas. Everybody who worked for Heinemann recognized his genius. The Navy recognized it.

I interviewed Heinemann one day for the book I wrote [*Douglas A3D Skywarrior*, 1998]. His philosophy was, when you design an airplane, if it looks like it ought to be a good airplane, it's going to be a good airplane if you put everything into it. He also said, "When I design an airplane I put an additional 'EHS factor' (Ed Heinemann Factor of Safety). I add 10% strength to everything." He stood up for what he wanted. When Heinemann designed something, it was his airplane that he designed.

I keep going back to the A3D because I am the most familiar with that one. When Heinemann designed the A3D the RAND [Research and Development] Corporation made a study. To do what the Navy wanted, the aircraft would have to weigh 200,000 pounds. Well, you can't put that much [of an aircraft] aboard an aircraft carrier. There's no way.

The Navy submitted requests [in 1948] to a lot of aircraft companies. Heinemann made a study of what the aircraft carriers could carry. He said, "I can build you a twin engine, long-range, jet bomber that will weigh 74,000 pounds." The other one [Captain Joseph N. Murphy] said, "Ed, I think you're lying to me." Ed stomped out of the office. He didn't like being called a liar.

Heinemann went back and talked to Murphy later on. Heinemann said, he [Murphy] apologized to him and said, " I was just taken aback when you said you could do something we didn't think could be done." But Murphy said, "OK. I want you to build me one." So, they went through the chain of command, and Heinemann said, "Ok. Here's what it's going to look like." They went through about eight stages of drawing what it was going to look like, and then they started building the airplane.

The Air Force is just as guilty as the Navy when you start building an airplane for it. "I want this in the airplane in addition to what you've got. I want this in it and I want that in it." Heinemann said, "No. You can't have that. The airplane is going to weigh 74,000 pounds maximum gross weight and this is what it's going to take. Put this much fuel in. Put these tanks in. You've got a bomb bay. You've got a place for three people. It's going to weigh a gross of 74,000 pounds."

Heinemann got some pretty high pressure to put additional stuff in the airplane. Finally, he went to an admiral and said, "Admiral, my airplane's going to weigh 74,000 pounds. I've told your people that you can have anything else in the

airplane you want, but for every pound you add, I will take out a pound of fuel. That's just the way it's going to be. You want to put 10 pounds of radio in, I'm going to take out 10 pounds of fuel." The admiral said, "The airplane weighs 74,000 pounds, and you're designing it. You tell me what you want in it and you do it." That's what Heinemann did. He finally finished with the A3D.

The Navy got their aircraft carriers strengthened. They ended up strengthening some of the decks of the aircraft carrier. If you slammed 74,000 pounds on a carrier deck in those days… A 74,000-pound airplane was a bigger airplane in those days. He was running 74,000 pounds on the aircraft, so the Navy had to redesign everything.

Heinemann did all his homework before he went into anything. He worked right with his people. He knew what he was doing. Heinemann knew what he wanted. He didn't vary them. "Heinemann's Hot Rod" - the A4D, look how long that thing lasted! People laughed at him when Heinemann said, "The A4D is going to be this big." It carries more bomb load than the B-17 [Flying Fortress] used to carry in the long-range. Of course, the A4D didn't have the range.

Heinemann was one of the most respected designers in the aircraft industry, particularly by the Navy. The Navy just about thought that Heinemann walked on water. The guys who worked for him would say, "You want it Ed? You got it!" It was just a relationship where Ed would say, "I think we ought to do it this way," and the guy would say, "Go do it that way." If it didn't go that way, Heinemann could get hard, "That's what it's going to be!" The guys would then go out there and do it. The guys would break their back for that guy. Heinemann was just one of those guys who drew respect from the people that worked for him.

Mulcahy: Did you have any contact with Heinemann?

Cunningham: No. I worked on things that he was deeply involved in, obviously, because I was in liaison engineering. I was directly involved with some of the things we did for the Navy, but not with him. The only time I ever talked to Heinemann was when I interviewed him for my book, and that was after he had a stroke [in 1975]. Heinemann pulled himself back from that! He did it! He pulled himself up by his bootstraps on that one. Heinemann didn't just design airplanes. He designed boats, a dirigible. He was just always doing something.

Mulcahy: How would you summarize Heinemann's contributions to the El Segundo Division?

Cunningham: I think without Heinemann and his personality, attitude, and the confidence that the Navy had in him, we would not have been where we were.

We [El Segundo Division] would not have had the jobs we did. We would not have had the same trust of the Navy to build an airplane. Heinemann said he could build it and he told the Navy what he was going to do.

For instance, when they [Douglas Aircraft] built the BTD [Destroyer], it was a "bomb" [inept]. It just wasn't going to make it. Heinemann was the one that went and talked to the Navy [in 1944], because he had a contract. Instead of going on and spending the money, Heinemann said, "The BTD is not going to make it, but I'll tell you what I'll do. I've got so much money left of the contract, I'll build you another airplane that will do what the BTD does and better." Heinemann showed the Navy the rough plans of the new airplane. Heinemann went to a hotel with his chief engineer [Leo Devlin] and [in one night] designed the new model [AD Skyraider].

Heinemann brought it back to the Navy [the next morning] and said, "The AD is what I'll build for you, and it won't cost you anymore than you've already got in the [BTD] contract allotted to it." Heinemann did it, and the Navy believed him and went for it. I don't know of anybody else who could have walked into the Navy and said, "We've spent 24 hours redesigning this airplane. We'll build it for you with what's left in the contract" and have them go for it with hardly blinking an eye. Like I say, Heinemann was the most respected man I know of with the Navy, with the people that worked for him, and those who knew him.

The Douglas AD Skyraider
The Navy Skyraider was manufactured by the El Segundo Division for 12 years. It flew ground attack missions in the Korean and Vietnam Wars. (Photo courtesy of Boeing)

Mulcahy: What do you think of Donald Douglas Senior?

Cunningham: I've got two little stories I want to tell you about Donald Douglas Senior. When he signed a contract with an airline or whomever, it was a

handshake deal. They didn't have to sign papers, because Douglas produced what he said he was going to produce. He did it and people believed him. The airlines believed him. American Airlines believed him and that's how the DC-3 got started.

When I was at the hangar around 1958, we had an old guy working the flight line who was an inspector. I don't know his real name. We called him "Scottie." He was getting on in years. As the workload starting dropping down, they started to lay people off, so they laid Scottie off. Now Scottie had been with the "old man" [Donald Douglas Senior] from back in the days when they were working for a week at a time with no pay, because they had to get a job done. This layoff devastated Scottie. It really knocked him for a loop.

Scottie went home and I guess he just sat there. I met his wife and she was a nice lady. Scottie's wife called Donald Douglas Senior one day, she said, "Don, they fired Scottie." I don't know how the whole conversation went, but I could imagine Donald going, "They did what?!" I could imagine that. Apparently, Senior got on the phone and called the plant down there and said, "Folks, don't ever do that again. Scottie worked for me when I needed him. He's got a job there as long as we got a plant there. You get him back into the plant." He probably didn't raise his voice, but they knew when Senior said something he meant it.

Scottie went back to work. He quit within a year of his own accord. He just didn't want to be fired by some shavetail who came in there and told him, "You're through because you're too old to do the job." A lot of people remembered that story. I was there when it happened. I think a lot of guys were no longer there soon after that because of what they did to Scottie.

The old man took care of his people. That's probably one of the reasons the [Douglas Aircraft] company didn't do any better than it did. Douglas Senior was not a bottom line man. He was a businessman, but he did things like taking care of his people. Anybody else would have made a little bit more money by letting that guy go and getting somebody in there more efficient. Douglas Senior took care of his own. I don't think anybody in that plant had anything but the utmost respect for the old man. Douglas Junior is another story, and I won't talk about that one.

Mulcahy: Did Donald Douglas Senior visit the El Segundo plant very often?

Cunningham: I never saw Douglas Senior. Never met the man, but that doesn't mean anything. At the time he was most active, I was on second shift at the hangar. He would not have been over there then.

Douglas Senior had a lot of other stuff going. He did a lot of oceanography research in his own boat. [He] studied whales down in Mexico. He did a lot of things other than aircraft, but I never met the man.

Mulcahy: Did the operation at El Segundo change very much after Douglas Junior became the president of Douglas Aircraft [Donald Douglas Junior was the president of Douglas Aircraft from 1957-1967]?

Cunningham: It didn't affect my end of the business. At that stage of the game, we were running out of work and things were just going downhill. Attitudes didn't change. The old guys were still there all the way through, right up until the end. We didn't have any change of attitude or anything, except the workload was going away. Finally, the jobs disappeared.

Mulcahy: Was the security at the El Segundo plant very tight?

Cunningham: Oh, yes, very. At the Long Beach plant we could drive in and out of the plant if you had a special permit. Nobody drove around the [El Segundo] plant except for the old man. Guards at the gate would totally "shake you down" [search you] if they wanted to. They'd inspect you as you went out the gate. Security and fire crews were there all the time. It had very tight security.

I had secret clearance for awhile, only because I was on the A3D program. It took awhile to get that through. You weren't allowed to work in a secure area unless you had that clearance. So, it was a military production company. Therefore, we were doing military work, and the Navy insisted on security so we did it.

Mulcahy: Were there many restricted areas on the plant?

Cunningham: No. Not really. The experimental area was restricted. The design development area was restricted. They had a guard at that gate. I never went in there. They developed the X-3 and the some of the other stuff that they developed in there was highly secret. The F4D was developed in there. That security was secure.

Mulcahy: Did the El Segundo plant seem more like a Navy base or a civilian aircraft plant? [Editor's note: The Naval Weapons Industrial Reserve Plant (DOD #26) owned the southern section of the aircraft plant at the Douglas El Segundo Division where Area B of Los Angeles AFB is currently located.]

Cunningham: It was more like a civilian facility that built airplanes for the Navy. The airplanes were the only Navy aspect, and the Navy pilots were the only things we had to do with Navy. We would have had the same type of

operation if we were building DC-6s or DC-3s. We were civilians just building airplanes that happened to be Navy.

I didn't realize that there was Navy-owned property at the El Segundo plant until recently. I never heard that. I've recently talked to several of the people I know who were in the plant during those years who didn't know that either. I never noticed the Navy signs if they were on the fence around the plant. As far as we were concerned, it was a Douglas Aircraft Company plant, and it remained so from the time I got there until the time I left. I'm just finding out that part of it was a Navy-owned facility.

Mulcahy: How did you work with Navy personnel while you were there?

Cunningham: My contact with Navy personnel was strictly on the flight line. Douglas inspectors did the inspection on the production line through Navy requirements. We didn't have Navy inspectors on each airplane coming down the line. The thing we did have was a Navy production test pilot over at the hangar, and a Navy enlisted crewmember or members over there. I knew them, and they were friends of mine. I got to know them, and they didn't treat us any differently from the way we treated them. We were just there to do a job. They were there to fly the airplanes.

We recognized that they were Navy. In fact, most of the time they wore civilian clothes on the plant. They had a Navy flight suit, but as far as coming into work, you probably wouldn't know they were Navy unless they happened to have some activity going on that required them to wear a uniform. We all knew they were Navy and we treated them as such, but that was just the way things were in those days.

Mulcahy: Did the Navy have a commanding officer at El Segundo that you were aware of?

Cunningham: Yes. The one I remember was Commander Jack Beeman. In fact, he lived two doors from me when I lived in Buena Park [California]. He was just like my neighbor. He was a neighbor, and was treated over there like a Navy officer and as a person who flew a Navy airplane. We didn't get any deep military activity that you'd expect.

Beeman had to fly an A3D up to Alameda [California] one time and bring back another one. He asked me if I'd go along. I'd been flying with him before and I'd been checked out in the A3. [We] flew up there, spent the night on a Navy base, and brought an A3D back down here to El Segundo.

Mulcahy: About how many Navy personnel would you say were at the plant?

Cunningham: Most of my life at the El Segundo plant was at the [B-3] hangar, and I only knew the two, Commander Beeman who was in charge of the Navy flight office, and an enlisted crewman there for awhile. They were the only two that I knew of when I was there. I don't remember seeing any others as based there.

Other Navy personnel came through to pick up an airplane, or came through for some tour or whatever. I was basically assigned to the hangar, so I only remember two people there at any one time. We had a crew of civil service people down there in their office doing all the paperwork business. As far as actual Navy, the two that I remember were the enlisted crewman and the pilot.

Mulcahy: Was their office over by the flight line?

Cunningham: Yes. The flight office was down the hall from us in the west end of the building.

Mulcahy: Why did Douglas stop building airplanes at El Segundo?

Cunningham: We were out of contracts. The only airplane that we did not quit building at El Segundo was the A4D, and it moved to Palmdale. The contracts for the A3 ran out. The contracts for the F4 ran out. They were being replaced by more modern aircraft. The Navy was buying aircraft from other companies for either political or military reasons. I don't know what they were. We built the ADs for a long, long time. As the contracts were not picked up, or the Navy had enough of those aircraft, that airplane would phase out and that part of the work disappeared. Instead of being replaced, people were laid off or transferred to the Long Beach Division.

Mulcahy: How did Douglas close down the El Segundo plant?

Cunningham: I can only talk about the hangar part of it. As things slowed down, people would disappear as they were either laid off or transferred. They would have a ceremony with the Navy for the last airplane delivered of a series, last AD-5, last AD-6 and last F4D. I don't recall that they had any big brass band type ceremony.

Towards the end, in my office we wound up with three engineers, my boss and two of us. The A3 was the last airplane we were building. I was the last one to leave there. Harvey Bosse was the other engineer, and he was transferred to Long Beach a year before I went down. Then my boss was transferred down there. Ray C. John and I stayed there until we finished the A3, and the A4D mod [modification] program. Then it was a matter of the facilities people just cleaning up and getting rid of everything.

Mulcahy: What was done with the production equipment?

Cunningham: All the production equipment there was Navy equipment by contract. It belonged to the Navy. It was disposed of however the Navy decided. It may have been cut up and melted for all I know. As they changed models, the tooling would be cut down. Maybe part of it was reused, if it could be reused, but it was Navy property.

Mulcahy: Did Douglas also shut down the B-3 and B-4 areas at that time?

Cunningham: Yes. The B-4 is the building across the PCH [Pacific Coast Highway]. B-4 is where we had the F4D assigned. There was a building down there where we flew the F4Ds out of. That closed down before we [B-3] closed down. Then as the B-3 area started slowing down, we started moving our stuff out.

The Douglas-owned electronics test equipment all came out and was shipped down to Long Beach. If it belonged to the Navy, it went to the Navy. We started cleaning out whatever we needed or didn't need anymore. When I left, the B-3 hangars were pretty much bare. I went back a couple times. I think the Coast Guard moved in after we had moved out. They took over at least one of those hangars. I don't know who's over there now. It was a slow process.

Gradually, as the last airplanes started coming through the production line, there was nothing behind them. When you finally got to the hangar, there was nothing left except one little mod program. When we finished that, we shut the doors, said goodbye to the El Segundo plant and drove to Long Beach.

Mulcahy: When was the last Douglas airplane produced at El Segundo?

Cunningham: The later part of 1960, early part of [19]61.

Mulcahy: When would you say was the last production flight out of B-3?

Cunningham: That last airplane would have been the last production flight. We built 12 trainer versions of the A3D. That was the last contract we had. Basically, when they were gone and the last bomber version left, everything was phased out. It was just a very slow shift down to nothing, so to speak. The last production flight would have been just prior to delivering the last airplane. The last airplane would have made a production flight and probably, within the last week of when we finished the airplane, it was gone. The El Segundo plant was no more.

Mulcahy: What did you do at El Segundo after the airplanes were completed?

Cunningham: We had the A4 contract. The Navy would fly the A4s in, and we'd put in what we called a "panoe" - a hang-down antenna on the wingtip. We would wire the airplane up, put the equipment in the airplane, and then the

Navy would come pick it up and fly it away. We didn't do the flying on that one. All we did was receive the airplane and do the work. At the end, I ran the flight office, was the radio operator and the dispatcher for about four to six months. Marv had a small crew that did the work on the airplane, fueled it, and called a pilot who would come pick it up and go. We didn't do any test flying on it.

Mulcahy: How did the Douglas employees feel about being moved from the El Segundo plant?

Cunningham: They saw the end of the line coming. You better be a little wide-awake about that stuff. As the work phased out, they went out looking for other jobs or got transferred to wherever they could go, maybe the Santa Monica [California] plant or the Long Beach plant. Some were able to retire. The [Douglas Aircraft] company would try to find most of them jobs if there was anything open. That was the first thing the employees would do. It was not that much of a difference driving to work in Long Beach, unless you lived north of the El Segundo plant.

People are about the same all over. When work phases out you get your feelings hurt if you get laid off first. You know? "They don't really like me." You got to remember that the company is in business for business. They can't afford to pay you when they have nothing, no income for the company, no income for you. I ran into quite a few people I had known at El Segundo when I went to Long Beach. They were scattered in various areas down there, particularly the management.

Mulcahy: Did closing the El Segundo plant create a large number of layoffs?

Cunningham: Not in mass, because the work started to slow down over the last two or three years. It slowed down gradually. You'd finish one little contract and nothing would fill in behind it, so they let those people go. The further back up the production line you were, the earlier you were let go. First to go would be the bits and pieces people, then subassembly, then the final assembly people. The last people let go, of course, were the hangar people.

Engineers were all transferred out. Basically, most of the engineers were transferred out way before the last airplane was delivered, because design was over with. Design can be as much as a year or two before you fly the first airplane. So, with no other contacts coming down the road, the handwriting was on the wall. We had no jobs. [It was either] go find a job or they'd transfer you. Most of engineering readily found jobs down at Long Beach, or North American [Aviation] across the street [Imperial Highway], or Lockheed. I don't think any engineer got hurt in that program.

Mulcahy: When would you say people realized that the El Segundo plant was going to be shut down?

Cunningham: I can't answer that. The only thing that hit me was when I knew that there were no other contracts following the last contract of the A3. The A4 had been moved out. My group at the hangar had been told that we would go to Long Beach. We were concerned that the plant was shutting down, but we weren't concerned for our own livelihood. We knew we were going to go down there, and we moved from the El Segundo flight line to the Long Beach flight line. It was just moving from military to civilian aircraft. Of course, at Long Beach I went back into the test program down there on the A3.

Mulcahy: How would you summarize your time at El Segundo?

Cunningham: Interesting and rather exciting at times. As an aircraft nut, being around aircraft was exciting to me everyday. I loved going in to work. We had enough different jobs going on. They'd bring in all kinds of funny little things.

We modified two C-47s [Skytrain] in a couple weeks. They were being converted to high-density seating. They were going to be flown over Kwajalein for the atomic bomb testing program. We had to go figure how to fly a DC-3 to Kwajalein. We went out and they gave us an open book. Harvey Bosse and I went out to all the surplus stores around and found metal seats, side seats, long-range fuel tanks, radio equipment, antennas. We designed it and did the work there. In about two weeks we did that work. This guy took those airplanes and never did come back. I hope he made it. Those are just little things.

We developed the A4 into a short field, dirt field, twin landing gear airplane in competition with the Army. Those were around the clock things. You didn't ask, "Do I get paid for this 24 hours a day?" No. You went and did it because it was fun to do. I liked the job. The guys I worked with liked their jobs. They liked the people they worked with.

There seemed to be a lot less acrimony and "throat-cutting" [betrayal] at the El Segundo Division than there was at Long Beach. We were "those guys from El Segundo" moving into their territory. The Santa Monica Douglas Aircraft people came in and there were times that some of them wouldn't speak to us. We went in and took over the Long Beach flight line from El Segundo. We just walked in to Long Beach like we were going meet some more new friends, but it didn't work out that way. It took us a long time before we were accepted down there.

When you walked into the El Segundo plant, you immediately had friends, it just seems to me. It just seemed that way. That's one reason I liked going in there. I liked being around the airplanes. When I got to fly on the test flights, it just added icing on the cake. I couldn't believe I was doing that. First of all, I

couldn't believe I was working on the airplanes and getting to do what I wanted to do on the airplanes. Then getting to fly on the airplanes, and being treated like another equal person on whatever I was doing, I wasn't used to that.

Mulcahy: How would you describe the El Segundo Division's contributions to the Navy?

Cunningham: Between [19]53 and [19]60, we were the major supplier of Navy aircraft to the Navy. We had more different models going to the Navy than any other company in the United States. I think that was one of the reasons we lost a lot of the contracts later on. It was time for somebody else to get some money out of the Navy.

The airplanes that we built were what the Navy needed. They needed the ADs at the time. We built a lot of those. When the Navy needed the A4, they approached the company and Heinemann says, "I can build you one." We did it. Heinemann did it and we did it. A3D, the Navy needed a long-range, Cold War-deterrent airplane and that's what we turned out. We did that. I think in that period, Douglas was more needed than any other aircraft company in the United States, namely because we could do the things they needed right then. We produced the product the Navy needed.

The Navy would later need supersonic airplanes and they would need different versions of aircraft. The time that I was there, we did what the Navy needed and we did a good job of it. Had we gone into the supersonic end of the business, who knows? We would have been closed down anyway at El Segundo, because of the LAX Airport. We had to go someplace else. Had we gone into that [supersonic] end of the business, we may have not been in business as long as we were. We probably would have been beat out by the competition. While we were at El Segundo, we built a good product that the Navy needed, when they needed it.

I think we [Douglas Aircraft] were one of the most necessary aircraft companies in the country at that time, not degrading any other aircraft company. The rest of the aircraft companies did a great job. Grumman did some fantastic stuff. Lockheed, North American, all those guys were building airplanes to the best of their ability. We happened to have Heinemann and old man Douglas' attitude. Our ability all fit together in one little close-knit package at that period of time. We were the top of the line.

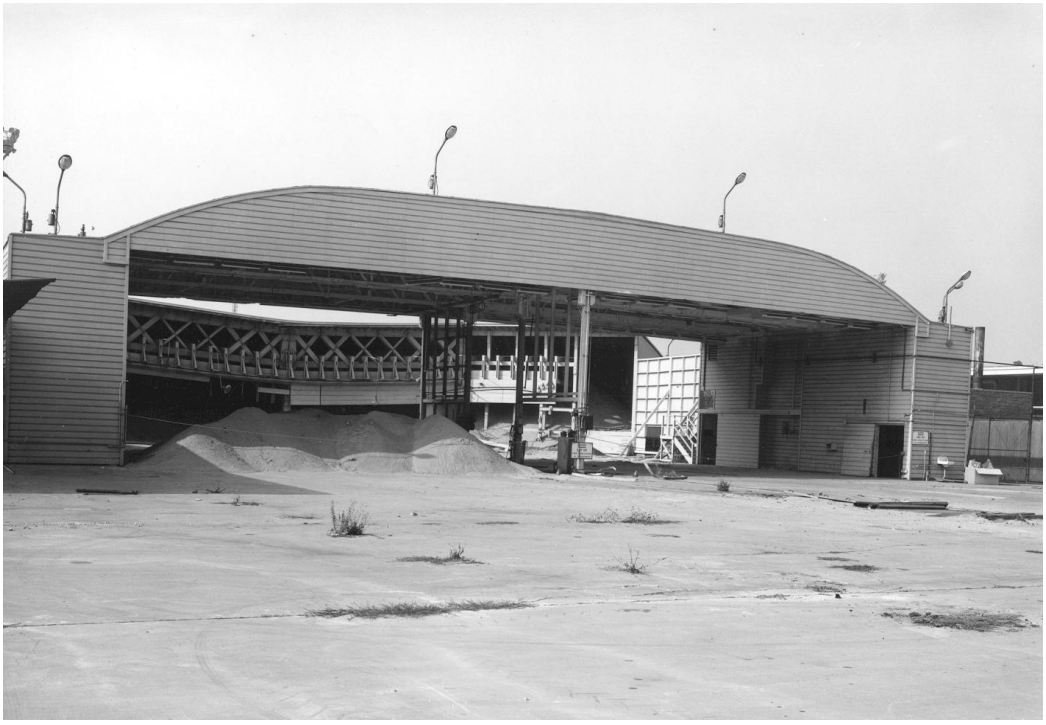
Mulcahy: What do you think led to Douglas Aircraft's downfall?

Cunningham: There were probably political reasons. I'm sure that contracts to other aircraft companies were necessary. Maybe the other companies went into Washington and had little more pull than we did. Who knows? I can't come up

with an answer on that one. Donald Douglas Junior alienated a lot of people, including those in Washington.

Mulcahy: I have some pictures here of the Douglas El Segundo plant in 1963 after you left. I am hoping you can give me some background about what these facilities were used for. Here is the aircraft gunnery range.

Cunningham: That was south of the main [production] building [Building 902]. It had big sandpits under the roof to bore-sight the guns on the ADs and the A4Ds. I would occasionally go out and… Since the Navy would do that stuff later on, most of the time that facility was used for the new installation of aircraft guns. If they changed a gun, or added a gun, or wanted to do some special testing on some special guns they used this facility. We didn't hear a lot of gun firing out there. When they did, you could hear it. It was just south of the building. It was a highly restricted area when they were doing any testing.



The El Segundo Division's aircraft gunnery range in April 1963. This facility was located within Los Angeles AFB west of Building 229.

Mulcahy: Would most of the airplanes have to go through here and fire?

Cunningham: Not necessarily. As remember it, they would do only special testing and spot-checks. I think the Navy probably did their own [gun testing] on the A4s and the ADs when they got to their own base. I'm sure they [Douglas] spot-checked every so often, just to make sure we were still putting

them in the right way. When I was working in this area, I was on second shift. Gun testing would have been done on the first shift, so I can't answer for sure. I do know they did all the new testing and revised equipment testing in the gun pits there.

Mulcahy: About how many rounds would an airplane fire?

Cunningham: Probably not more than a dozen. They didn't fire just one round, see where it went, and correct it, because all of them aren't going to go the same track. So, they'd fire maybe a dozen rounds totally out of all the guns on the airplane.

Mulcahy: They had a target or a bull's-eye in there?

Cunningham: Yes.

Mulcahy: Do you recognize these water tanks?

Cunningham: No. I really don't. They're south of the [production] building, as I recall, but I don't recall being involved in them.

[Cunningham and Mulcahy are now driving through Area B, which was previously part of the Douglas El Segundo Division plant.]

Mulcahy: We are looking at Buildings 240, 242 and 244. What do you remember about them?

Cunningham: When I was here, these buildings were used for the final assembly of the A4. All the bits and pieces were brought in here. The production line ran the entire length of one building. They assembled the aircraft, did the systems tests, and then brought them over to the B-3 hangar for flight. No manufacturing, per say, was done in these buildings. It was all assembly of the subassemblies that were built and shipped in from other areas.

Mulcahy: We are looking at Douglas Aircraft photograph number ES 139218 that shows the interior of Building 244. [Refer to page 7 to see this photo.]

Cunningham: This picture shows just the forward section of the fuselage minus the radome of the A4D-1 [being assembled]. It doesn't have the aerodynamic splitter on the leading edge of the inlet. It has one forward section right behind the other, a long line of them all the way down the entire length of the building. Many aircraft went through that area. I don't recall seeing this area, but I do know from the picture, that's the way they were put together. Palmdale had the same setup as this.

Mulcahy: Here is Douglas Aircraft photograph number ES 139221 that shows the interior of Building 242.

Cunningham: This is the wing assembly area [of the A4D-1]. The wing was built in one piece. It was put on the assembly line on an individual roller dolly where all the attachments were made, the tanks were sealed, and all the wiring and everything that went into the wings. It was all done down this line, from one end to the other in steps, in phases, and in positions. Each position had a certain job to be done. There must be 30 wings down the length of this line, but there were very few people working on it in this photo. At high production rates, there would be people doing installations on every position all the way down the line.

An A4D-1 wing assembly line in 1961. This building is currently (2001) used as the base Fitness Center (Building 242). (Photo courtesy of the Museum of Flight/David D. Hatfield Collection via Katherine Williams)

Mulcahy: We are now looking at the south end of Northrop-Grumman's main production line facility, Building 902 [500 North Douglas Street].

Cunningham: The center section we are looking at with the row of slide up doors was a main assembly line. Over in the left with the lower roof of the building, was what we called the "development slot." That's where I was when I first got assigned down here. We were developing the A2D, building up the first two prototype models and some others to follow. The A3 came right down the center of the building.

When we built the first production model of the F4D, it was built at the end of this building, at the firewall. Halfway up the building was a solid firewall, all the way across, for a firebreak. Right up in that area, to the right of where we're

looking at the end of this line, was where they developed, built the first F4D that I saw.

AD line was originally two production lines headed this way [south] from the firewall, the AD-5s to our left and AD-6s on the one to our right. When they phased out, then the A4 came in. The A3 came in the line to our left at this center part of the high ceiling building. All of the A3s were built here at El Segundo.

The south end of Northrop Grumman Building 902 in August 2001. Adjacent to Los Angeles AFB, this building was the main production line facility for the Douglas Aircraft El Segundo Division.

The A4 was assigned to the right line side all the way down. They built those there at a high rate of production until the A3s, of course, ran out of the contract. Before that, the A4s had terminated the operation here and had to move to Palmdale for more than one reason. One of which was probably political. The other was that we were making too much noise for the area, because the A4 is a loud airplane, so is the A3. A3 has its own particular screeching, screaming squeal when they're in the air. The A4 was just a loud airplane. It made more noise than it did anything else.

The people used to say the A4 was a fantastic little airplane. They'd roll the A4s out of this door [Building 902]. If they were complete, then they would be towed by tractor directly to the flight line over to the [B-3] hangar. If the A4s were not complete, they would be stacked around in this area south of Building 902 where the incomplete work was completed. Installations were made to the airplanes that hadn't been completed, or were waiting for parts to come in.

I have photos at home showing maybe a dozen A3Ds out here at any one time. They were waiting for certain parts, or some flight test phase had failed and they

couldn't build the airplane until they corrected some major problem. For instance, when the A3D center wing spar cracked before it reached the maximum that they wanted it to reach, they had to go back and rebuild all of those.

The area to the right of the lower roof in Building 902, a lot of development went on in there. A lot of supply areas were in there. That area had in-plant inspections, offices, storerooms and warehouses, supplies, tool rooms, and such as that. It brings back a lot of memories.

Mulcahy: Do you remember Building 229 over there to our right?

Cunningham: No, I do not. I don't remember that building at all. I'm sure it must have been there, because I think I have a picture showing it. But when I was here in this area, my entire life was spent inside Building 902 on second shift, so I was not out here.

Mulcahy: We are now parked at the Northrop-Grumman Building 203 [815 Hornet Way]. Is this where Ed Heinemann had his office?

Cunningham: He was in the engineering building, north of Building 902. As I recall, Building 203 would have been our design engineering building. I think I may have been in there once in my whole lifetime. My lifetime in liaison was down in the other buildings. Heinemann's office, his chiefs of staff and all those, operated out of this building. Design was done in this building.

I think Building 202 [827 Hornet Way] was our product display building with our product support groups. There was a display area where we showed the Navy our maintenance, disassembly and reassembly of aircraft mock-ups.

Mulcahy: We are now on Imperial Highway south of the LAX flight line near the former B-3 area.

Cunningham: I recognize the old terminal [Hangar No. 1] at the gate down there from where we're sitting. The edge of our property divided us from North American. The actual B-3 hangars are gone. They were much closer to the old terminal than the FedEx [Federal Express] building [5927 West Imperial Highway] over there now. We had three hangars that stretched from the flight line back [south] out towards Imperial Highway, fairly large buildings, eventually taken over by the Coast Guard. They are long gone now, but fortunately the old terminal is a landmark. They can't tear that down, so that's my landmark to know where I am. I wouldn't know where I was if I hadn't spotted that building, because it's totally different now.

The pallets that we're looking at now would be about the front of where the old B-3 building was. Maybe it was even further back to our right [east]. There was

just enough room for the flight line at the terminal with the engine run blast walls. To the west of that was a wide enough place where you could probably park three A3Ds abreast. The B-3 buildings were in place there.

The three white Douglas Aircraft B-3 hangars at LAX on 15 July 1954. Note historic Hangar No. 1 at the lower left and Imperial Highway in the rear. (Photo courtesy of the Boeing Company via Patricia McGinnis)

There were large two-story hangar buildings where you could probably even fit a B-52 [Stratofortress] in there. A [Boeing] 747 would even fit in there. The B-3 buildings have been since torn down and have disappeared. FedEx has moved their building back. It stretches almost all the way back to Imperial Highway now. AiResearch is probably gone.

B-3 sat in the middle of this area. We worked all the way around the building with aircraft. A3s were generally on the south side and some were on the east side. The F4Ds were usually on the west side until they moved them down to the B-4 hangar location on the other side of PCH.

Mulcahy: So, the former B-3 area was where this big, open cement pad is now?

Cunningham: Yes. There's just nothing to remind you that B-3 was ever there.

The Douglas El Segundo Division during an open house on 14 November 1954. These buildings were within the current property of Los Angeles AFB and they include: (from left to right) the aircraft gunnery range, the aircraft paint booth (the 2001 People Center, Building 219) and the modification building (the 2001 Auto Hobby Shop, Building 215). The El Segundo built airplanes include: (from left to right) AD-5 Skyraider, AD-6 Skyraider, A4D Skyhawk, A3D Skywarrior, F4D Skyray, F3D Skynight, and the A2D Skyshark. (Photo courtesy of the Boeing Company via Patricia McGinnis)

Mulcahy: Do you have anything else you would like to add about your time at the El Segundo Division of Douglas?

Cunningham: I've already said about everything I can. I can't emphasize how great a place it was to work.

I met Lew Whittier at a meeting several years ago. Lew was the VP [vice president] of product support at El Segundo. He ran the product support that supported the Navy. His people would call him "Lew Whittier and his 40 thieves." What the Navy wanted, the Navy got. When those guys were out in the field that's what they got. When I moved to the [B-3] hangar (I had been at the hangar for about six months), they gave Liaison Engineering to Lew Whittier. He was the one who promoted me to Engineer in Charge of second shift at the hangar.

I met Lew several years ago. He was getting pretty old, and at this time I'd been with the company about 38 years. I said, "Tell me something. I was at

El Segundo for eight years. I have been down here at Long Beach for 30 years, but the 'good old days' to me were always at El Segundo." Lew said, "You know? You're right. They were for me too."

There was just something about the El Segundo attitude that seemed engrained in everybody out there. That it was a great place to work and we were all friends. We were here to do a good job, and there was no real throat-cutting. I never saw the throat-cutting I witnessed when I moved to Long Beach. Lew thought about that and he said, "Yeah. You're right. El Segundo were the good old days."

El Segundo was a great place to work. I enjoyed the work. I looked forward to going into work every night. I was on second shift to start with over there, even at the hangar. When I went on first shift I went into flying. There are no bad memories of that place. I have no bad memories of that place, none. That's what I keep remembering as I look back on my life. There are no bad memories of El Segundo.

Mulcahy: I would like to thank you for your time.

Cunningham: I've enjoyed talking with you. I rambled on quite a bit, and so if you get any good out of it then more power to you.

Mulcahy: Thank you.

END OF INTERVIEW

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