



## **William Boyer Oral History**

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## **Note to Readers**

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This copy was produced from a bound, hard copy final version of the interview.

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- Benson Ford Research Center staff, 2023

**AUTOMOTIVE DESIGN  
ORAL HISTORY PROJECT**

**BOYER, WILLIAM**

**1984**

**EDSEL B. FORD DESIGN HISTORY CENTER**

**Henry Ford Museum &**

This is Dave Crippen of the Design History Project at the Henry Ford Museum, and this is June 7, 1984. Today we are having a chat with William (Bill) Boyer, longtime Ford design executive who has agreed to chat about his career in design and styling at Ford.

Mr. Boyer, our format is that we try to keep the mike as unobtrusive as possible and ask you to start at the beginning and give a detailed discussion of your career in design at Ford and elsewhere.

A In order to start at the beginning, I'd have to start with the decision to get into design. I went from high school into World War II in naval aviation. After the war, I decided that I wanted to be an aeronautical engineer. I attended the University of Maryland, since I was a Washington D.C./Bethesda, Maryland, type. I discovered, in my second year of engineering, I had a lot of drawings of boats and airplanes on the dividers between my subjects and decided that as a mathematician, I'd make an excellent truck driver. I had three years of the G.I. Bill left. I went to Pratt Institute in Brooklyn.

Q A well-known design school?

A Yes. Very well known. The reputation of the school was excellent, and there were thousands of G.I.'s trying to get into it, so I felt very fortunate that I was in there. You mentioned Ken Spencer. He was in the class ahead of me, but we knew one another at Pratt.

I received a scholarship to General Motors, so I ended up with two years in an experimental studio at G.M. Some of that time was actually spent in one of Mr. Harley Earl's design studios. Then a gentleman named Frank Hershey called me and invited me to come over to Ford and work on a new sports car that they were going to do.

Q Was that the initial contact?

A That was the initial contact, yes.

Q Is there any reason why Frank would single you out?

A I had known Frank through a church contact. He had left Packard as chief designer. He had come to Ford, and we were just acquainted. He was acquainted also with my work, and he knew I wasn't all that enthusiastic about the styling at General Motors -- the personnel relations.

Q Before we get into Ford, could you tell us about your work in the Earl studio at G.M.?

A I got into the experimental end of it with a gentleman named Bill Lange whose studio I was in. Then after some work on the manuals for the XP-8 -- Mr. Earl's LeSabre -- I was transferred into Mr. Earl's B Studio where we were working on the '52 Olds/Buick body.

At the time Frank called me, I jumped at the opportunity to go to Ford and work on a sports car.

Q What was the situation in the styling department at G.M. that made you available?

A It was a very autocratic organization under Mr. Earl. I was a low profile guy, and they were rootin', tootin', shootin', high-living kinds. I just elected to opt out of that organization and come to Ford, which was like a breath of fresh air. It was like coming to a big family, which I enjoyed much more. I never regretted the decision, regardless of the G.M. bonuses.

I arrived at Ford/Dearborn in March of 1952, working in what is now Triple E Building where the styling section was then located. Frank Hershey brought me in and introduced me to Gene Bordinat, who was the

head of the design operation in the styling section under Charlie Waterhouse, chief engineer at that time. I would work immediately for Frank Hershey and the late Damon Woods, who was in charge of body development studio.

Q Mr. Woods had come from where?

A I'm not sure where Damon came from. He was a University of Michigan graduate. I know he worked at Curtiss Wright during World War II. He wasn't in the service during World War II. I think he had an exemption because he was working for Curtiss Wright Corporation in engineering. I know he related some incidents of working on the canopies of the aircraft at Curtiss Wright. I don't know just what his history was in coming to Ford, whether he was acquainted with some of the Whiz Kids that came out of the....

Q He may have come over with Buzz Grisinger?

A It could have been. No, Damon was here prior to Buzz Grisinger. Buzz Grisinger and Rhys Miller had a design studio in town. But I was working for Damon until he went to Ford of Europe as design V.P. He later lost his life in an untimely accident on the I-94 expressway near Ypsilanti.

Q What sort of man was he to work for?

A I respected Damon tremendously. He was a very creative individual and always had things very clearly in focus. A very nice person and very dedicated to his craft. It was certainly a loss to the industry when Damon lost his life. I worked for Damon in the body development studio. The first full program I was on was the 1955 Ford. At that time, Frank Hershey was trying to interest Gene Bordinat and the Ford management in

responding to the Corvette series. It was being introduced by General Motors' Chevrolet division. We had had a couple of abortive attempts in trying to get this off the ground, and it was with some effort on their part that management finally agreed that, yes, we do need a style leader in the sports car area. Because virtually all sports cars were European at that time -- Jaguar XK-120, the Austin Healy, and the Maserati. Everything in this country was imported in terms of sports cars. And our car -- we wanted more volume than could be entertained by a pure sports car, so we agreed that ours should probably have roll-up windows and a top that would operate more efficiently than most of them had at the time.

Q I remember the MG top.

A Right, the MG of that era. And even the Corvette had a strange little Oriental top. It was a funny little car built of fiberglass. I can recall Henry Grebe, the chief body engineer at that time, insisting that our sports car was going to be in steel with roll-up windows and done properly or we weren't going to do it at all. He was responsible for the body.

Q Can you give us a personal summary of what the design process was in the early 'Fifties? Were you more oriented toward working with the body engineers?

A Not really. Although we were under engineering, we've come full orbit here. The latest contractions of the industry -- that painful contraction -- has resulted in us being, literally, back under engineering, with no longer Gene Bordinat as vice-president. That's essentially the way we started out under Charlie Waterhouse -- under

engineering. We've come full circle. But the design center is much bigger than the styling section was in those days because of the proliferation of car lines. Everything is of a greater magnitude. But, surprisingly, until the introduction of the computer-aided design, which really hasn't been introduced yet functionally into the design center, the actual process didn't change appreciably. As a matter of fact, when I was writing workload letters for Jack Telnack and trying to justify our position and relate workload to personnel and trying to cover our tails over there in the design center when things were being cut back so bad, I noted that one of the great sculptors like Michaelangelo and Leonardo da Vinci could come in and pick up a clay modeling tool and know just what he was doing. It was almost a medieval guild type operation. And there's still a lot of design judgment and personal effort that goes into it. Most of the effort to date in computer-aided design is downstream of the creative process in the design center. The surfaces are picked up by a scanner, and it's digitized, and it goes to body engineering. It's disseminated through the system, but the actual conceptual sketching -- the visualization of the form and the modeling -- hasn't changed appreciably. Only now are we getting programs in house where designers are going to be designing directly on the graphic tubes. So it will be the next generation from myself that really applies that in depth.

To answer your original question, there were virtually no change overs over many years. We should probably have moved faster. There were changes regarding more sophisticated recording equipment -- the scanners and milling of properties -- clay models and things like that -- that speeded up the process to some degree, but the basics were essentially untouched in the creative process.



Q Will you go through, step by step, the sports car program -- who was involved, who did what, who was responsible for the original concept, and the conceptual design? Tell us of your various colleagues, what they did and who you worked for? The story has been told two or three times, but this is a great opportunity to get your full story on that project that eventually came up with the Thunderbird.

A In late '52, we were doing some package work in 3/8th on the Ford sports car. At that time, our package work was done on 3/8th scale because the package department at that time consisted of two people in the Ford studio: the late John Zimmerly and Everett David, still extant up in the Anchor Bay area. The original concept was that we wanted a sports car that had some of the nuances of the current Ford vehicles that would have rub-off value in the merchandising of the vehicles. The first shot came back from engineering that they would cut down the car and shorten the wheelbase, but the engine wouldn't be moved back. That just didn't seem suitable. It really wouldn't have the handling and the balance that you would design in a car that allegedly competed with the Europeans, although not in reality.

The second phase of this came some months later in early '53 that, yes, the engineering fraternity has agreed that we ought to do the thing right. I've mentioned Mr. Griebe's views on that. We got a very nice package with the engine moved back: two passenger with the occupants slightly aft of amidships which gave us a long hood, short deck proportion. A very sporty concept for those days which would set the trend in the sporty look for many years to come, including the Mustang, which evolved some years later.

At that time, there was myself in the studio. I was, more or less, the senior guy in the studio because I had all of three years in the business. I worked for Damon Woods, who was the section supervisor. Frank Hershey was chief stylist for Ford at that time. Gene Bordinat was chief stylist for Lincoln-Mercury, both working for Charlie Waterhouse. A young gentleman by the name of Dick Samson was in the studio for a while at that time. The major portion of the car -- the sketching that was done -- was by Dick and myself. In those days, the body development studio was responsible for the initial body sheet metal, and then as the car evolved, the Ford studio would take it over and do the ornamentation and wheel covers -- the finessing of the vehicle. Interestingly, the '55 sports car was done as an interior/exterior model. The interior was modeled right in the exterior buck. That was a technique that had never been used before, because, when the top was down, we wanted the interior and the exterior to relate properly and not have some of the glitches that you run into on the European cars where things don't look properly coordinated. They don't have a continuity of surface.

We started on the body and got it well along and then ran into the usual problems of, hey, this is going to be a very low-volume car. We can't afford all the tooling for things that you guys are dreaming of. Let's get realistic. Same bumper bar front and rear. Let's plagiarize the '55 Ford with its finials and its headlamps and taillights, all of which was very familiar, because I had been working on that program. In Ford at Fifty, there's a picture of me taken by Philippe Halsman who did the photography on the full-size board of myself working on the '55 Ford. So it was very easy to translate that stuff into the sports car, minimize

the tooling cost and get it into an affordable range where the car could lunch off the major Ford line of cars in a little line down at the end of the Rouge Plant and make economic sense. At least, it was sufficient that you could write it off for advertising and marketing expense without having to undergo the surveillance of the bean counters, which, in their minds, every project had to pay out in a certain number of months or years or it was a no-go situation.

The most traumatic experiences were trying to preserve the design intent of the car with those constraints. Also, we had a highly politically-charged environment about that time. George Walker had come in and had Joe Oros and Elwood Engel in the studios. They were the design consultants. Since we didn't have a huge nor respected styling department at that time, they were always looking for somebody else to bless this operation. It led to some confrontations between the consultants and the studios. The consultant came in and helped out and many times presented the cars and took credit for what the styling guys had really evolved, and the work they had done was not acknowledged. So we had a bit of a frenzy there for awhile until George Walker came in as vice-president, which put an end to all of that. He could then legitimately say, "I am king of the hill, and you guys do what I say." But it wasn't all-out war; it was just a tension that was always existent between our typical consultant/in-house design team thing.

Well, I can't say there weren't some ruffled feathers, because they had taken the '55 'Bird and presented it to management and said, "Look what we did. Isn't it great?"

Q Oros and Engel?

A This was George Walker and Joe Oros. Engel was on Lincoln-Mercury at the time. Those are the little political aspects you never really hear about, but that exist in any typical management organization. But I later worked for Joe and George and had a great time. We were all great friends.

As the vehicle evolved, there were others who were involved in the design of the vehicle. When it went into the Ford studio, I remember Dave Ash, in particular. We had an engine clearance problem on the top of the carburetor because of locale, and Dave came up with a very neat power dome concept which established the identity of that 'Bird on the hood which hadn't existed before. As a matter of fact, I was talking to Lois Eminger of the Classic Thunderbird Car Club because they want me to give a talk at their national meeting here in July. She has one of the little 'Birds without the power dome; one of the early prototype hoods without the power dome, because it was a late edition by Ford studio after the car had pretty much been processed. A lot of the ornamentation, basically, was done by the guys in the Ford studio. The name was given to the 'Bird by Alden Giberson -- Gib as we called him. Gib was the one that came up with the Thunderbird name, and he was given a beautiful suit of clothes by Lewis Crusoe, which had been the incentive to come up with the name.

Q It came out of his interest in Arizona Indian lore?

A Yes. He was familiar with this and thought that it would make a great name for the car. It ended up being selected.

Q Were there other names in consideration?

A Oh, yes. There were hundreds of names.

Q What were some of the finalists?

A One of them that Mr. Crusoe was interested in was Saville. Saville Row in London -- the street with [custom] tailors. Of course, he was familiar with Saville Row, and that had connotations of luxury and the prestige to him that said nothing to us. We bought our clothes off the plain pipe racks at Robert Hall and Sears. That's the only one that I remember.

One of the ones we didn't use and did come into prominence later was Cougar.

Q That was the code name for the Mustang.

A I don't know whether it was or not. The Mustang, as I recall it, was called Special Falcon very early on. As a matter of fact, the first Falcon was called XK Thunderbird. That was the code for Falcon. Joe Oros called me back -- I guess, it was 1957. We didn't get Friday off after Thanksgiving in those days, and I was going to take off Friday and go back home to see my folks for Thanksgiving, and Joe called me and said, "No, you're not. You're going to be in here on Friday. We've got a new small car to start, and it's got to start now." That was the Falcon, which was code named XK Thunderbird.

I was interested to find out that the first Falcon that was produced in Australia was called XK Falcon. They don't have a model year designation since they're not introduced in an annual manner. Now, they had picked up the XK of the Thunderbird drawings of which they had received from the U.S. to do modifications to the original Falcon that was being manufactured in Australia. That was probably 1962. They picked up the '60 Falcon tooling and modified it for Australia and put it

in production. The XK Falcon started the original series in Australia, and it went on and on -- the X series. And then it started over with a new Falcon called XA, XB, XC and XD. On the XD, I happened to be chief designer for Australia, so I got back in the Falcon business there for a while.

Q Lewis Crusoe was chief of what we now call North American Automobile Operations?

A Yes. At that time, he was vice-president and general manager of Ford Division, which is now NAAO, and it embraces the whole operation of Ford and Lincoln-Mercury.

Q Since he'd come from G.M. and may have been familiar with the Corvette project after the war, was it his idea of what a sports car should be?

A I wasn't privy to that kind of information in those days. I was just a little guy in the corner on the board. The only thing that I do know is that George Walker and Lew Crusoe were at the Paris Auto Show, and George knew of our efforts to get a sports car before he came into the organization. Mr. Crusoe mentioned it at the Paris Auto Show that, "Boy, we ought to have something like that." And it was alleged that George went and called Frank Hershey or somebody back here and said, "Hey, you know that project? Get it going, because I just told Crusoe that we've got one, and, by God, there better a clay model going when I get back!"

Q That's too good of a story to....

A I heard this from Frank and various people, but I don't know. But it sounds like George Walker. He was the ultimate politician.

Q Frank Hershey would have been the person that he would deal with?

A I would think so, because he was the chief stylist of the Ford studio, and George Bordinat was the Lincoln-Mercury chief at that time under Charlie Waterhouse.

Q Walker hadn't quite come in yet?

A No. Walker came back when we broke away from engineering, and we became an entity of our own. And Walker was a V-P reporting to Lew Crusoe. That was the first time that engineering and design were disassociated as far as the organization chart goes.

Q Waterhouse was the chief, and Hershey and Bordinat were under him?

A Yes. They shared the Lincoln-Mercury and Ford [design supervision]. Actually, it was Charlie Waterhouse that hired me in '52. But it is a good story, and it sounds very plausible. But, I wasn't really privy to that level of conversation at that time.

The product planning people at that time -- the chief planner was Chase Morsey. Another planner was Bill Grimes about that era. The secretary of the styling committee was Eric Lange who was an engineer and recorded the minutes and kept track of the meeting results in those days. That was in '53. Then, in 1973, I went to Australia, and there was Eric Lange as chief engineer at Ford of Australia. We worked twenty years later together, myself as chief designer and him as chief engineer.

Let's see if I can remember more of the planners about that day. As a matter of fact, shortly after that, I met Don Petersen. It was on the '55 Ford about the time that Don Petersen came back from a stint in the Marines and was product planning manager for Ford Division. He still had Marine greens and a brush haircut at that time.

Q Tom Case?

A Tom Case was product planning manager for the Thunderbird car line. The other guys -- Chase Morseley, Bill Grimes and Petersen -- were up the ladder a little further in more executive positions. Tom Case is the guy that I worked directly with as the product planner in charge of the product.

Q You've got a mandate from the top, you've got Chase Morseley, you've got the body engineers, and you've got the design set?

A Yes. Once we had the cost situation well in hand, we solved those problems. The next thing that occurred was the instrument panel cluster in the little 'Bird that had been modeled in the full-size buck. It was much too expensive to tool on a low-volume car, so that got cast aside -- that instrument cluster, in particular -- and we reverted to using the '55 Ford cluster. It had the little turn signal blinker in the nacelles in the side, and the trepanned skull in the see-through top behind the speedometer. We virtually picked up the instrumentation intact and utilized a lot of it, except we integrated it into a unique panel in the 'Bird with an engine turned applique or ornamental panel.

Q Your original design for the panel was cast aside?

A In a sense it was for '55. It was so well liked that the cluster was timed for the '56 Ford, which was a big, domed, almost an orchestra shell type with the round gauges in it. It got tooled on a high-volume Ford where they could utilize it. Then, because it was then existent, we picked it up on the '57 'Bird, because it had been funded and created in sort of a roundabout manner. So, at the time we facelifted the '56 and went to '57, there was our original cluster, so we put it in the car and cobbled it into the panel and blended it all in with the crash pad.



Q It worked very well?

A Yes, it was a very successful remarriage because of its origin in the 'Bird and its utilization two years later.

Q In '53, you're working on the original design?

A Yes, right. Interestingly, one of the first cars that we put the deep-dish steering wheel on our crash pad/instrument panel was the '56 'Bird. The '56 'Bird actually had a ribbed, localized panel ahead of the passenger, and the deep-dish steering wheel with its collapsible column.

Q Which was popularly supposed to be able to absorb...?

A The chest load without the penetration of the column. And seat belts. A lot of work was done on those 'Fifties Ford cars on safety, and nobody much acknowledged it in those days. There were some rather snide commentary about Ford selling safety and Chevy selling cars. Chevy came out with a V-8, so they got their macho image. We were being the good guy selling safety and going right down the tube. It was bad news in '56.

Q But you were vindicated?

A Ultimately, a couple of decades hence. That was pretty much the team that evolved the vehicle. It was very limited in its offerings, as far as accessories go. As far as colors go, there was white, and red, and turquoise and black. That was it for the first introduction -- very few colors.

Q At the design executive level, was it accepted right away, or were there some problems getting it accepted?

A It was accepted at the level that it counted, which was Lew Crusoe in those days. It's a bit of a dichotomy. You can get these projects

off the ground, and if they aren't guaranteed success, you have a hard time getting participation. Anything that doesn't have a guaranteed reception that is positive, has an onus of "Boy, let's run away of that one. I don't want to be associated with it." So there was a mixed feeling there. At the time, I just happened to be there and was given the assignment to work on the car. and we were too young to recognize the political danger and jeopardy we were all in working on such a car. It was an ignorance is bliss type of thing.

Q Were you caught up in that sports car mystique in the early 'Fifties? Did you find it congenial working in this tradition?

A Oh, yes. We were all trying to break away from the Ford and Mercury four-door sedan idiom that we were working in and we had. We weren't that far past the World War II era, where anything you could pump out was acceptable. We were just beginning to get into an era where people were replacing the worn out wartime cars and were beginning to look for a little pizzazz and some excitement. And management recognized the fact that more imports were going to be brought in.

Q The European sports car was coming into its postwar orbit?

A Right. As a matter of fact, one of the popular cars of the day was the Nash Healy, which was an American Nash and Healy of Great Britain cooperative effort. Jaguar XK-120 and the legendary Cisitalia, which was the first one that put the hood molded in the fender line, which was a very desirable thing at that time. And, of course, the Ferraris. As I recall, of the cars that we used as our bogeys in the development of the program, there was a black Ferrari that Henry Ford II had over at the test track. There was some Jaguar XK-120's, most of which were owned by

doctors in Grosse Pointe. A bit too rich for the common man's blood at that time. We rented those, and brought them in and used them as stalking horses for our efforts to do something that was not as sporty as that, a little more traditional and yet more suited to the American market. A few more conveniences.

Those cars evolved out of the European ambiance that they had into something that was more sporty than a sports car and something that we could evolve from Detroit iron and the American hardware without getting too exotic.

We did try and introduce several things that never happened on the Thunderbird. We tried to put road lamps in the circular guards that were on the front bumper. We did get the exhaust stacks coming out through the rear bumper guards. Did that for several years. We did try to do some competition windscreens for the vehicle. It never happened. The efforts to get the full wrap windshield were greater than a desire for the competition windscreens. I still have the original sketches when the program was nearing its end.

There's a series of sketches with the competition windscreen and the road lamps. It's interesting in the fact that we evolved things that never became part of the program, which is typical of the design process. You evaluate which options are going to sell and will pay out according to the bean counters' guidelines, which will not fly and will not get approved....

Q The car was an instant success?

A Yes. It became a legend in its own time. Tom Case loaned me a little convertible. It was the Fall of '55. My wife and I had never had

a honeymoon. I took her back home to visit my folks and down to Maryland. We went through Skyline Drive and down into Virginia and Maryland in a black Thunderbird convertible. People would snap their heads around to look at it, but they didn't know what it was at that time. It hadn't got the exposure. The cleanliness and the simplicity of the design carried the car. I still have an ad for the car from The Saturday Evening Post of October, 1954. It has the checkmark molding like the '55 Ford, and our enthusiastic management and marketing people thought this great checkmark swash molding would be just great for one pure, pristine little sports car and said, "Yes, it would go on the high series," over our dead bodies kind of thing. And it actually got out into the advertising copy, and several magazines published it.

Q There was a prototype?

A Yes. As a matter of fact, Mr. Crusoe drove it around for quite some time.

Q It was one of his ideas? At least, he supported it?

A He supported it. It actually evolved off the Mystere showcar which I did in '54.

Q Interesting concept car.

A Yes. The Mystere showcar was done in '54, but we used a lot of stuff off of it for the '57 Ford. So the use of the car in the Detroit Auto Show was delayed a year because some of the cues that were used on the '57 Ford were the swash moldings and the fins related too much to the production car to expose at that early date.

Q How were you able to disabuse the management about the checkmark?

A Frank Hershey and Gene [Bordinat] just talked them out of it. They just convinced them that it was not the right thing for a sports car

which was supposed to be clean, functional, unadorned. It's a hard thing to protect a pure concept in a large corporation.

Q Everybody wants to add something?

A Yes. Everybody wants to get their oar in. But we just had a couple good salesmen talking to them. The car never appeared on the street with the molding, which kept it, in a sense, more of a classic than it would have been. The lack of the molding kept it far enough away from the production Ford, and it really had that clean, classic look which we were striving for.

As I say, a lot of projects like this scare enough people away that you get a once-in-a-lifetime kind of opportunity to do something without a lot of help.

Q As a designer, what was your inspiration? What were you thinking about at the time you made these early sketches?

A As a pilot, my concept of the car was something that was relatively aerodynamic. Something that wasn't taken seriously for another twenty-five years until CAFE and the oil embargoes hit us full force. When I think back, this November I will have soloed forty years ago.

Q You still fly?

A Yes. I soloed on my 18th birthday -- November 1, 1944. With that background, my concept in the sketching of a car was simply to get a smooth aerodynamic shape that would be fuel efficient and sporty looking. In my experience as the head birdbrain over there for about fifteen years, that philosophy probably comes through '58 to '61. In '61 to '64, there was a clean airfoil shape interrupted by whatever you have to have: grilles, bumpers, guards, lamps. But that kind of philosophy flowed through the thing.

Q You were the keeper of the flame?

A Yes, in a sense. Because what happened really was when the car was an instant success, and the Mystere showcar had been done and introduced on the '57 Ford, I became manager of the Ford and Thunderbird studio. So, really, although you didn't have a very elevated status, you did an awful lot by execution simply because you were there. It stayed intact because there was nobody else to do it. Keeper of the flame in that respect is control by virtue of execution of the vehicle.

Q It was pretty fluid still at the Design Center in these early years? In present days, it's a more rigid structure?

A In those days we didn't have the highly-definitive product assumptions we have today. It was because we didn't have the research clinics, and we didn't have the in-depth analysis of the markets. It was a shoot-from-the-hip situation. More of an intuitive response of the planners, the marketing people, the stylists or designers. It was looser in the sense that you didn't have the research to control the product, which gave us the opportunity to do some rather fantastic things.

Q You were winging it?

A We were really winging a lot, relying on our own inspiration, our experience and the world around us for inspiration, really. The jet aircraft was a lot of our inspiration -- led us astray to some degree. But it provided a volatility in the market and esprit de corps in the design and engineering areas that you find hard to come by today. Everytime we go out to a research clinic, I've always maintained that they're excellent for package analysis and for features; absolutely useless for styling prognostication. It moves so quickly three/four years

hence, that all they do is set you back five years everytime you go to a clinic. It's very retrograde. It's a very frustrating thing to come back from a clinic, and everybody loves what they have today, because they just went out and paid big bucks, and nobody will admit it. Every once in awhile you'll get a glimmer of direction, but mostly it handcuffs you. I think management has shown more understanding of utilizing research better in the styling sense of late. And in some areas, like in the truck area where people are very conservative, you do have to be very careful. You're doing a functional vehicle, and, if you come out there with a toy instead of a truck, you're going to lose. So, in that sense, it's quite valuable.

Q Was the Mystere a precursor to the period of the Thunderbird and the '57 Ford?

A We finished up the 'Bird in '53. We were completely finished with the 'Bird probably two years prior to production. If we're not finished with it, we're late. We're holding up production, literally. Then there was a interim period before Thunderbird justified its own studio where I had the Ford advance studio, so we really did the advance vehicles for the shows in which I did some, and Ford studio did some. Damon Woods and Dave Ash and I all worked on the Atmos showcar, which was a double pod, double canopy, finned -- a kind of F-86 fin -- which was done for the show in which the Mystere was not shown -- the '54/'55. The Mystere was probably shown in the Detroit Auto Show. That would have been January of '56 prior to the introduction of the '57 Ford in November. Although it was done in '54, it was held over. It was a wild concept with this swash molding, and these pods, and this rather sculptural fin and these big

blast tubes coming back, and this bubble canopy with a cummerbund and a snorkel for air conditioning. And it had spherical instruments in pods. I was the head of the studio, Gale [Halderman] had come in, and Jim Quinlan was in the studio at the time.

Q This is the advanced studio?

A Yes.

Q So the Mystere was one of your first projects?

A Yes. It was the first personal showcar project that we had an opportunity to do. The vehicle was actually built by Creative Industries out on the East side. We did the clay model -- mold -- and then we had to run back and forth to do the final vehicle, because the showcars were too much workload for our poor little shops at that time. We couldn't quite handle the production work and these vehicles at the same time.

Q Was it a driveable prototype?

A No. It was strictly fiberglass -- rollable -- but it wasn't driveable. A couple of the cars prior to that time had been driveable.

Q Which ones were they?

A XL-500, X-100 -- fully operational cars, but they got to be terribly expensive for show purposes. You could evaluate the appeal of the car without having it fully operable.

Q These were, in effect, design laboratories in which you were allowed to go very far afield?

A Yes. We were allowed to do anything that we pleased, feasibility notwithstanding. As a matter of fact, the Mystere had thin shell bucket seats, a hard back and a soft cushion, which, ultimately, showed up in the '64 Thunderbird. We got those thin shell seats in the '64 'Bird. As



a matter of fact, they were originally swivel seats. There's a rendering here of myself working on a swivel seat proposal, but we never did it, and Chrysler came out with their big fin jobs. It was one of those things that we didn't use, but they did.

There were many features that guys will come up with in various companies -- no collusion -- just inspired by the same things and are a parallel development. All great minds run in the same rut. Chrysler came out, two or three years later, with it. We were trying to facilitate getting in and out -- entry/egress -- on a very low package, because the car was only fifty-two inches high. It had a very high tunnel, which we couldn't do anything about. We didn't have front-wheel drive, so we obscured it with a very neat console full of all kinds of goodies and gadgets. That evolved out of the aircraft experience, too -- the consoles, the radios, and throttles. So it was taking an imposition into the package of the car and creating a feature with it. But, form follows function. If you have trouble getting in and out of the car, you try to invent new ways of swinging out and then standing up.

Q Who killed that?

A It was probably engineering workload and cost. There's a limit to what you can accommodate in the programs with the people you have. I don't think it was somebody personally killing it. I think it was probably PIPed out of the program; PIP meaning "profit improvement program," and it's gone. You can't accommodate it.

Q Ladies would have loved that?

A Yes. It was well received in the Chrysler vehicles. But it's one of those things that -- it's like the Turnpike Cruiser -- the Mercury

with the electric memory seat. It's like the phase we're going through now with digital readouts and electronic panels. I don't think the means justify the ends. It's too far out, too complex, too costly. There will be a phase we go through, and once we're through the novelty of it, we'll probably revert back to a more simple presentation of data.

As a matter of fact, I got a kick out of Jackie Stewart at the Indy 500 on TV talking about the Corvette instrumental panel -- the electronic panel in the Corvette -- saying, "It was utterly bizarre!" It was giving you so much information all the time that the human mind couldn't cope with it; it couldn't sort it out. He's an old analog guy, read the needles and shift at the right RPM kind of guy. The best there ever was. I think he was a bit befuddled by all the high tech.

And we'd go through the same thing. It's a merchandising gimmick to some degree. It's probably great on a 747 when you're out over the Pacific to punch in the buttons. If you don't punch the wrong buttons and get over Sakhalin Island. But it has a real application there. I question sometimes whether we don't go a little ape.

Q You don't need an on-board computer?

A Not yet. For emissions, yes.

Q So here you are in the mid-'Fifties. The Thunderbird has been launched successfully. Of course, you've gone way beyond that. You're working in the advance studio. For whom?

A I was still working for Damon Woods at that time. Frank Hershey was still there. Frank probably left sometime in '55. My last memories of Frank are bringing a '55 Ford Crown Vic[toria] magenta and white see-through roof Skyliner out into the middle of the yard, squealing the

brakes, and making it dip and bow. And with Don Petersen saying something really profound like, "Hot damn! Look at that car!" So, Frank was probably gone by mid-'55. He was a highly-independent character, and rather than follow George Walker.... I don't know just what transpired.

Q Were you working with Bob McGuire at this time?

A When Frank left, Bob McGuire was head of the Ford studio, and, I believe, by that time -- '61 -- Gene Bordinat had become V.P. after the Walker era. Bob and Don DeLaRossa -- at that era we were working for Gene Bordinat. And then, ultimately, Gene became the V.P. [of design].

Q So what was engaging your main attention at this point -- '56/'57?

A In '56 and '57, the '58 Thunderbird, where we made the transition from the two passenger to four passenger and made ourselves highly unpopular with all the Thunderbird buffs. Very poor decision as far as the car buffs go. It portended good things for Thunderbird as far as business decision and volume goes, because the 'Bird sales volume went from something like 13,000 in '55 to 15,000 or 16,000 in '56, and 21,000 in '57. But the research was telling us, "Gee, we just wish we could get a couple of kids in the back." And we looked at some 2+2 concepts, and it was decided, no, we'd go for a full-fledged, four-seater type close coupled, but full-fledged package.

Q It was a momentous decision. How did it come about? You talked about product planners.

A It was one of those things that some of the lower echelons wanted to do. They saw the potential there for increased volume. Do a four-passenger 'Bird. It was a tremendous investment of funds and a rather unknown quantity. Engineering didn't support us. The studio went ahead

and did the four-passenger 'Bird clay model. Did it to a high degree of completion without it being what they called a validated program in those days.

Q What was that?

A A non-validated program didn't have any engineering support. There was no funding and no engineers assigned to run out feasibility and everything. And it looked like the 'Bird was going to die. And Bob McNamara, of all people, who was really a numbers man -- super genius -- came in and made a big pitch for that car and saved it, literally.

Q Where was this?

A At the Design Center.

Q But presented to whom?

A To company management. And literally saved the car. Henry Griebe was still chief engineer at that time and assigned no people to it since he had no funding -- no budget for that thing -- and they suddenly had to scramble and assign people to it, and it became a real living program. Even the package development hadn't been done. So the clay model -- we literally took templates off the clay model. It was engineered from the outside in. The package was developed, the seating was done, and it went from there. So the '58 'Bird was strictly a project of the Thunderbird studio.

Q That you were chief of?

A Yes, right. So we'd always thought Bob McNamara was strictly a financial genius and had very little feeling for the vehicle at that time, and his selections are those things that he -- he was very conservative in his tastes, and we were all shocked, astounded, stunned and

much relieved when he came through and recommended the program be carried on.

Q This sort of confrontation would happen at the Design Center with top management there?

A Yes. There would have been the meetings in the showroom when the car was presented. You either flew or you died, one or the other.

Q At this time, McNamara has succeeded Lewis Crusoe as the chief of Ford Division?

A Yes, right.

Q And Crusoe retired with a heart problem?

A Yes, correct.

Q And so the 'Bird was dying. Not enough numbers in terms of production?

A Nobody could justify it because it was an entirely new design idiom. Personal luxury didn't exist at that time. It was either the Ford, Mercury, and there were convertibles, which tended to supply the sporty market. The small 'Bird was thought to be a passing fad, just a hiatus. So it was very difficult to justify a car in that price range. At that time it was a \$3000 car. It was a horrendous price when things were selling for \$1600 or \$1700. So it was a very difficult thing to justify, and it took somebody of McNamara's stature -- V.P./general manager of Ford Division -- to simply say, "I'm putting my reputation behind this, and I want to see it happen." That made it happen. Very much like Lee Iacocca when he launched the Mustang. Without Lee, the Mustang probably would never have happened.

Q McNamara is a very interesting personality?

A Oh, yes.

Q He had gotten the confidence of Henry Ford II?

A Yes.

Q With his unique manufacturing sense. Have you ever speculated as to why he did that? Do you think he felt that it would enhance the Ford line?

A I think that probably his vision was a little greater than the numbers crunchers which were recommending against it and could see that we needed the perpetuation of this kind of an advanced vehicle which was breaking new ground. And they were trying to get Ford out of the Tin Lizzie era; trying to appeal to the people that wanted to go upscale and yet wanted to be youthful. Ford had the reputation of being the blue collar worker's car. Mercury was the blue collar worker's Buick, and it was that kind of imagery that they were still trying to overcome.

Q During this period from '52 to '56, a parallel effort was being made to plug the upper end of the line -- the result was the Edsel. Were you involved in any of that?

A No. I was strictly Ford Division at that time. I didn't become involved. I was in the Ford Division end of the styling from '52 through early '69. In '69 and '70, I had Lincoln-Mercury advanced for the first time, in which I participated in some of the work on the original Mark III and Mark IV. Then, immediately after that, in '73, I was sent to Australia as chief designer on the Blackwood Program, the Falcon/Fairlane/LTD -- the Australian versions of those cars.

Q What were your reactions to the concept of changing the T-Bird to a four seater? Were you in favor of it?

A I personally liked the concept. We did several vehicles. We did extended two-passenger vehicles with different themes -- front and rear end themes. The front-end theme two-passenger version of the '58 that we did ultimately got picked up in a modified form for the front end of the Mustang several years later.

Q A good designer never throws anything away?

A No, no. We keep all the sketches. As a matter of fact, at that time, Joe Oros was the chief designer/chief stylist of Ford studio. And, although I was someplace else, Joe had remembered that car. He and Charlie Phaneuf and some of the other guys that worked on the Mustang had gone back and picked up the photographs and sketches of this '58 two passenger. It evolved off this '57 'Bird, and it translated, with much modification, into the Mustang product. The basic theme was the high mouth and the low blade-like bumper. It was basically the theme of single headlamps out there. The mouth was smaller, and the whole package was smaller, but the essence of the components were there.

Q The four-seater went very well?

A Yes. The four seater in 1958, the volume jumped up to about 40,000; in '59 it went to 50,000; and then in 1960, it went up to around 60,000. Ultimately, it got up into 60,000 and 70,000 from '61 through '64-'66. The last 'Bird I was involved with was the '70 or '71. Then it made a change. It began coming off the big Mark body, which was evolved from the Torino. It became a much bigger car. There was an era when the Thunderbird was really the Ford Division's version of the Mark. It was a successful car. That way we handed the Thunderbird market to Chevrolet with the Monte Carlo. We walked out of that segment of the market, and

they jumped in there. They had never been able to do anything that would offset the Thunderbird, and that was their opportunity. They jumped in with the Monte Carlo and were very successful with that.

Q What was the evolution of that?

A The Mark became very successful for Lincoln-Mercury. The premium name in Ford Division was Thunderbird. So they wanted a Mark kind of car in size and ambiance. In that sense, they started taking the 'Bird off the bigger body. It was more commodious -- a much bigger car in terms of interior accommodations. It got away from the very close coupled, clubby, personal luxury car it had been previously. It evolved into a bigger machine, and that left a gaping hole in the market there. The Monte Carlo -- Chevrolet took advantage of it. At least in my mind, that's the way it happened.

Q They did very well with that?

A Oh, yes. Then we recognized that, and we came back with the modification of the Torino -- the Ford Elite -- which John Naughton elected not to schedule very many because he didn't like it and dismissed it. That was a blunder on our part.

Q How do some of those decisions get made? Would it be product planners deciding that they've got a market hole to fill, and they say to the designers, "Look, we've got to do something. We've got to make this more palatable to a wider audience?"

A Yes. Those things get decided with top management of the planning, marketing, design and financial hierarchies and the design sub-committees -- the product planning committees -- on which all top executives sit.

Q At this time, in the mid-to-late 'Fifties, you're still outside of the mainstream of decision-making in this process?



A Yes. In 1961, I became design executive for the Ford Thunderbird. At that time, Gene was the vice-president, so really those things were handled at the vice-presidential level.

Q Gene Bordinat?

A Yes. Gene Bordinat was involved in those corporate kinds of decisions. As designers, we were strictly in the background. Maybe we were there in the showroom to support -- putting things on and off the car or change proposals, but we weren't actively involved in the corporate management. I really didn't get involved in any of that until I went to Ford of Australia as chief designer, where you were a bigger fish in a littler pond.

Q You were able to influence certain corporate decisions?

A Yes. Brian Inglis was the managing director in Australia. A tremendous guy to work for. Sir Brian Inglis. He was a guy that really respected the designer and said, "If that's the way you think it ought to be, fine, we'll do it. But if it doesn't come out right, put your tin pants on and get ready for the onslaught." He had the ability to delegate the authority and had the decision-making down. Terrific guy. I enjoyed working for Brian tremendously.

Q So after the two-seater Thunderbird, which went very well for a time, what sort of activities were you involved with?

A At that time, Ford and Thunderbird studio were combined. So there was a whole series of Thunderbirds and Fords that evolved. The next move was to put the Thunderbird front end and some of its rear end cues on to the '58 Ford, because that was the whole reason for being that the 'Bird was to inspire and elevate the prestige of the production vehicles.

Q There was a lot of that going on?

A A lot of that going on. Something that was cared for and began to influence the whole industry was the blind rear quarter roof, which evolved out of the little two-passenger vehicle that we had done. We put a roof on there that was removable -- hardtop -- simply to make it more of an all-weather car and not so much of a sports car. When we did that, Mr. Crusoe couldn't see coming from Silvery Lane onto Outer Drive with that oblique 45<sup>o</sup> degree rear view, so we put portholes in there.

Q Is that how that evolved?

A What evolved was Mr. Crusoe complaining about not being able to see with that rear oblique approach, so we came up with the portholes as a solution. We came up with that by going back through a lot of old coaches and things -- English coaches, Victorian coaches. Funny names like the boobie hatch, and the landau, and all those old names. We said, "Hey, a porthole wouldn't be a bad job." And that, in turn, influenced the later Marks with their oval windows in the rear quarters for the same reason.

Q But yours was the first?

A The porthole in the 'Bird roof was really the first, which was a functional requirement. The boss didn't like poor visibility. Do something or else. The blind quarter roof got interpreted then because it was a very structural look, and its closed clubby look on the '58 Bird got associated with prestige. We picked it up in the Ford Galaxie in order to enhance the upscale "take me to the theater" type of very formal roof to get rid of the Tin Lizzie connotations and lift the car up into a more formal, more of a Lincoln -- or I should say Cadillac -- ambiance at

that time. So one thing led to the other, and the cues that were developed for the 'Bird got translated throughout the car lines.

Q The Thunderbird effect was very beneficial to Ford merchandising into the 'Sixties?

A Oh, yes. They had the Thunderbird V-8 Y-block engines, chrome-plated rocker covers and turquoise Thunderbird Western motif and Navajos -- the other Indian tribes that do this nice silver work in the Southwest -- the Hopis. So we were taking our cues wherever we could find them.

Q From contemporary artifacts/traditions?

A Yes.

Q That leaves you in the early 'Sixties. What are you thinking about? What sort of assignments are coming your way?

A In the early 'Sixties we would have been working on the mid-'Sixties vehicles, which would have been the last 'Birds prior to the introduction of the large bodies when they tried to simulate the Mark IV market for the Ford Division. I was sent to Australia and got off on the Lincoln-Mercury vehicles.

Q You parted company there?

A Yes, I parted company. I didn't get back to working on 'Birds -- it was '75 where the 'Bird became a very high-volume car. Gale [Halderman] worked pretty much on that, because I'd left for Australia. Then when I came back from Australia, I was made director. Ultimately, I became director of luxury and intermediate, and the '83 'Bird/Cougar was the last one I worked on.

Q Can you describe the Australian experience, how it came about, and how you enjoyed it?

A We were looking for people that were willing to pick up lock, stock and barrel and go to Australia. Somebody that had sufficient experience to be chief designer, because they were anticipating effort on an all-new car. They had asked me to go to England and Germany previously, but my kids at that time were in the latter stages of high school and college, and it was just not possible. When the request came for the Australian assignment, and my youngest daughter was in between in her last two years at college and was more than willing to go with us. My older daughter just finished a master's degree at the University of Michigan, and my son was in the navy, so Australia looked pretty good. This was 1973, so I'd been at Ford twenty years. It was a good time to make a break and get a new perspective on things.

We went down there, and I spent three years as chief designer, which is a tremendous experience. It was a new thing to us. We enjoyed the people tremendously. Didn't enjoy much of the tax situation, but it was a real education. I went down there as a visiting industrial expert with seventy percent of my salary paid out to me down there and thirty percent withheld back here for the various things you're into, and you cover your insurance costs. I was told that I was going to be taxed at U.S. rates down there. I was down there ten months, and the labor government, which came into power in Australia, rescinded all the conventions with the U.S. on VIE's -- the visiting industrial experts -- and suddenly I was being taxed on a hundred percent of my U.S. salary at a sixty-six percent rate being withheld from my salary. So I ended up with a subsistence allowance down there to live on. Exactly half of my take-home pay was committed to the house that I rented down there, and the

rest of it was for food, and that was it. In that respect, it was a little bit of a trying experience. But as far as the business experience and the opportunity to travel, it's a once-in-a-lifetime opportunity. Really great.

Q Previous to this, you had been working on fairly large automobiles as the design executive of the Lincoln studio?

A Yes.

Q And you'd worked on some pretty interesting models there?

A Yes. The original Marks. That was a fun time, too. It was the first time I'd had the chance to work on prestige cars, other than Thunderbird. It was an interesting experience. It was good because most of the cars in Australia at that time were large cars. The Australian Falcon had evolved into an 111 inch wheelbase, 60 inch tread tiger of a car. A Cleveland 351 V-8, 11 to 1 compression, and it went like a scalded aardvark. It was a brutal car for a brutal country. It was a car that -- today they are continuing -- they are not picking up the European Scorpio or the Ford Taurus. They are reworking their own car. The conditions are sufficiently rugged in the outback of that country that the original Falcon just pounded the suspension to pieces. A very poor reputation, and yet that was in '62.

The XD Falcon that I worked on was the car that took over market leadership from G.M. in Australia in 1981. We were working on this car back in '76, and they just gradually built that car up into something that was so durable and had such good quality that ultimately achieved market leadership from a locally-built car imported in the engineering sense from the U.S. where the highways are so good that you can get away

with much lighter components. And over that span of years from '62 to '72 -- that ten/twelve year period -- they came up in percentages from 7 to 9 to 13 to 17 percent and up to around 22/23 percent of the market. Ford gained leadership from G.M., and the rest of the market was pretty much Japanese and European.

Q What was the design setup in Australia?

A Very much the same as here. The bridges that we used were the same. It was just like being at home. There were subtle differences. We didn't have work done on the scale that we have here. It was like a sixty minute football team. The designers and the modelers literally worked on the cars. It went from modeling into the plaster shop and into the fiberglass with all the same people following it through. And then all the same people were moving the cars and taking them down to the exhibition hall in Melbourne and clinics and research. It was a little team that was very effective. A tight-knit group.

Q Was that at Geelong?

A No. It originally started out in 1925 at the two plants in Geelong where they assembled the Model T's. Those plants ultimately became the product engineering area where Eric Lange held forth as the chief engineer. And then during Jack Telnack's era down there in the mid-'Sixties, they built this new design center. Then Duncan McRae was chief designer, and then I followed Duncan as the chief designer. I inherited a beautiful little design center.

Q A miniature Dearborn?

A Yes, really. It was just a miniature version of it and very nice facilities.

Q Telnack's inspiration?

A Jack Telnack kicked it off, yes. He provided the impetus for it and moved out of Geelong and never got the opportunity, to really see the fruition of his works.

Q You probably had a dual personality there, in the sense that you were designing for the cities and the outback?

A Yes. As a matter of fact, the cities are very much like ours, except that when I first went down there, it was like going through a time warp. You flew into a city that had streetcars like I remember as a kid in Washington, DC -- trams. Many, many little businesses, very few highways, no supermarkets. It was like suddenly being transported back to pre-World War II Maryland/Washington, DC area for me. But then in the outback, an hours drive would take you into nowheresville. They had special high-ride suspensions. They had very stringent sealing problems for the dust in the outback. Very stringent requirements for protection of the engine from the dust. All cars had air extractors, because of the high temperatures. Very little A/C at that time, although air conditioning has come into its own.

And, surprisingly, they had a very high-quality level that was demanded by the consuming public because the per capita income wasn't all that great, and the car was quite an investment, much more so than in the U.S. So the paint finishes had to be top notch, and the quality had to be good or you got the thing back. No bloody way was any Aussie was going to take any quality that wasn't first rate.

Q Did you have a rust problem there?

A They did have a rust problem in the coastal areas: Brisbane and salt spray. Most of the time when I got down there, I was amazed to see

little Falcons and old cars running around just as pristine as the day they came out, because they took good care of the cars, and the very dry climate tended to preserve them. They demanded a high quality, and they got it. And it was a very difficult thing because the new Australians -- the immigrants -- the first place they would head for for jobs was the auto plants. They didn't have to know the language, and they had signs in the plants in five different languages. So they worked on the line until they could master some of the language. In the Sidney plant they had three hundred percent turn-over one year, so the quality was difficult to achieve with that kind of turnover.

Q Certainly to maintain?

A Yes, to maintain it.

Q The styling influences were pretty much what the buying public was asking for?

A The image cars in Australia were different from the U.S. The image cars down there were Mercedes, BMW, Jaguar. The American cars, of course, were left-hand drive and were known as "Yank tanks." The British cars and the European cars with the right-hand drive were the preferred cars, or their export models. So most of the image cars were the European. The Yank tanks were regarded as much too big a slug. And you saw them occasionally around Melbourne and Sidney, but most of them you saw them at Pine Gap and Alice Springs out where the missile tracking stations were. It was odd to go to the center of Australia and see all these old Dodges and Fords and Mercurys that U.S. employees had brought over there. They weren't converted in the Northern Territory. The rules weren't too stringent as to which side of the road you drove on. They weren't getting many out there, so Pine Gap had a lot of Yank tanks.



Q The XP Falcon was one of your creations there?

A Yes. That was the car that I was responsible for.

Q How did that come about?

A That car was really an interpretation of the European Granada on the Falcon chassis suited to Australia for both manufacturing and marketing reasons. It was not a copy by any means, but I would say the general theme of the car was very much the European Granada of that era, because it was a fairly advanced car. It had a good feeling. It kind of split the difference between BMW and Mercedes -- the image cars in Australia. And we simply picked up the theme and utilized it. It was really a better-looking car, in my mind, because we weren't restricted by carrover doors like the Granada was. We had aero headlamps to work with. We had a wider stance. So, although it was that theme, I always felt that it was a more gutty, solid-looking car. Very successful car in terms of conquest over the poor old G.M.H. -- G.M. Holden -- Falcon, Fairlane had just slaughtered the Holden and the Statesman and those cars that they had down there.

Q They're just now recovering after all these years?

A Yes. I think they recovered somewhat. G.M.H. had sixty percent of the market right after World War II, and they were gradually chewed up by the Japanese penetration and the Ford succession without really realizing what was happening to them. They sort of went on their merry way thinking they were invulnerable, and they weren't.

Q The Japanese influence is being felt at this point in the early 'Seventies?

A Yes. When I went down there, they were importing Escorts and Cortinas from England because being a right-hand drive country. The

quality wasn't all that good, and the Japs were coming in with better quality and better economy. A lot of the industries in Australia were protected so the quality of the vendors submitting the components wasn't that good. The Japs were making inroads. They were really doing the job. Chrysler has the Mitsubishi. They had the Galant and the Lancer down there.

Q Chrysler of Australia?

A Yes. Which it doesn't exist any more. I think it's gone. But they had a nice line of mostly Japanese source cars. Ford has since transferred its source. They've gotten Toyo Kogo in Mazda as a Japanese partner. The Telstar and those vehicles now are Japanese sourced -- the front-wheel drive vehicles. They had to have an economical way of going from rear-wheel drive to front-wheel drive because of its success. But the big Falcon, Fairlane, and the LTD are still rear-wheel drive.

Q And they're still selling them?

A Yes. Don Thompson, who worked for me down there, was in the hall in the Design Center today when I went over there for lunch. He said they had taken the old straight six -- 250 cubic inch six -- put a Bosch Jetronic induction system on it -- fuel injection system -- and made a very nice engine. It's called the Cherry Engine Program, and that's been doing very well for them, because they phased out the big Cleveland V-8's. The fuel prices down there were always fairly high. They didn't get incapacitated like we did by the Arab oil embargo, because they have a tremendous capacity for petroleum. They have a lot of sources in Bass Strait. They took a lot of their own oil right out of Bass Strait. Between Tasmania and Australia, there's a large oil field.

Q Did you have any input into the Laser?

A No. I was gone by that time. The cars that I worked on were the Escorts, the Cortinas. The F-Series trucks and the L-Series trucks were introduced while I was down there.

Q All went very well?

A Yes. They were quite successful, the Laser and the Telstar. I was back here by the time that they had made contacts with Toyo Kogo. Andy Jacobson was down there. Jim Arnold followed me down as chief designer. He was there only about eighteen months, and then he was brought back, and Andy Jacobson went down. Then, at that time, Brian Inglis was asking me as to who I would recommend -- a local Australian -- that could succeed to the design job, because they wanted to have an Aussie chief. The Yanks were pretty expensive to billet and keep down there, and they were trying to get a guy trained at the plant, and John Dowdy was the obvious candidate. John Dowdy is now the chief designer.

Q He's one of your proteges?

A Yes. A local Australian and just doing a bang-up job.

Q This tour of duty gave you an interesting perspective on different types of design procedures?

A Oh, yes. I got much more acquainted with both the Japanese products and European products, which proved immensely valuable when I came back here, since the Japanese and the Europeans had a such an influx of vehicles.

Q Tell us about the beginning of the Minimax.

A The Minimax was really designed around 1969/1970 by Ken Spencer. Ken finally said, "Where are we going to go? We can't go lower and lower

forever. Suppose you change your thinking and say maybe taller and narrower is better because people have to get in and out." He came up with the little Minimax package which, I believe, he named. I remember him working on that thing, and it was the first time we had access to any little V-6 engines or V-4 engines. They were out of the Cardinal Program, which came from the Taunus Program in Germany. So, he did this little, narrow, high minivan type of package and called it the Minimax. Nobody was interested in it. He was just a Mercury advanced guy at that time, so it didn't go anywhere.

Then, when I came back from Australia, Ken had been director of this advanced area, which I took over when I came back. So, Ken and I were working together. He was the exec, and I was the director. So, we were given the assignment of doing another van project. We had what we called the Minimax van, and then we had what we called the Carousel van, which was a big Econoline front engine, rear-drive type. We collectively resurrected his concept of the Minimax, did it, and got Lee Iacocca interested in it. But we still didn't have any front-wheel drive platforms at that time. We did the vehicle, we researched it, Lou Veraldi built it in metal down on Michigan Avenue in Inkster, Lee drove it up and down the expressways and was enthusiastic about it. It researched great, but Lee had been shot down at that time by Mr. Ford as to bringing in Honda engines, front-wheel drive transaxles, and doing the small cars. So we had no front-wheel drive platforms to do it on, even though it researched like gangbusters.

When Mr. Ford punted Lee through the goal posts [to Chrysler], Lee simply said, "Hey, the K Car platform is here. I can do my Minimax." So the [Plymouth] Voyager van on the road today is virtually the Minimax.

Q Which was Ken Spencer's?

A Which was really Ken Spencer's inspiration back around 1969/1970. So here about fifteen years later, there is Ken's vehicle running around at Chrysler under the auspices of Lee Iacocca who literally took the concept with him and built it on the K-car platform at Chrysler.

Q Was Hal Sperlich involved?

A Hal Sperlich really wasn't involved. He had gone to Chrysler a couple of years earlier, because he, too, had incurred the wrath of the high muckimucks by wanting to do front-wheel drive, small cars. And Henry [Ford II] had misread the market and said, "Those things will never fly. Let's do the Fiesta in Europe. That's where it belongs."

Q He loved that car?

A Oh, yes. It was a neat little car. It was the "Wolf" Program in Europe. So, that's the history of Minimax and Plymouth Voyager.

Q So you were there for a couple of years working on special projects -- international and advanced concepts?

A Yes.

Q Then you moved into the mainstream of mid-size?

A Yes. That was the era in which we did the T-Bird. I was never involved in the genesis of the '80 'Bird because I was just getting back from Australia. The '80 'Bird was, more or less, there, but I was put in charge of the studio where 'Bird, Cougar, Mark and Lincoln were done. During that interim, we finished up the '80 'Bird and did the facelifts on that and got into the '83 'Bird/Cougar program. In what led to today's Mark VII was what we called the Lincoln Concept '90, the original model was reworked, and it became a showcar -- Lincoln Concept '90.

Then I went off into never-never land as director of design services and trim and color, so I wasn't working directly on any specific car line for a couple of years there, until I got caught in the whirlwind of demotions and cutting back staff. Then I got put in the truck studio.

Q This is a quantum leap era in the late 'Seventies? You're coming up with some incredible new concepts?

A I think the desire to do them had always been there, but marketing had such a stranglehold, conceptually, on what was acceptable. And everybody was in so much trouble with fuel consumption. It was kind of a desperation move. And in recognition of the fact that, with proper aerodynamic styling, you could save hundreds of millions of dollars of drive-line and engine improvement. So, all of a sudden, the lid came off, and we were allowed, and absolutely mandated, that we should go to the wind tunnels and get these things more fuel-efficient. The C of D became gospel. "Get 'em down" -- the coefficient of drag. The numbers are utilized in advertising now since the people are conscious of fuel consumption and aero. I'm almost afraid that we've moved too quickly. That it's going to take some education. The 'Bird and the Cougar are successful, and the Tempo/Topaz is good. But those cars are, in fact, going to have to educate the public into an acceptance of the aero look, and with the availability of fuel and the leveling off of prices, there's not quite the pressure now for that kind of performance in the eyes of the public. I'm concerned that the Illinois hog farmer, and the Kansas grain farmer, and the guy in Texas is still going to like his old Panther/Lincoln Town Car concept, which we have virtually annihilated. There are

not many plants building those things anymore.

Q Where is the actual plant?

A The St. Louis facility that builds the Mercury will be phased out for Aerostar vans. Mercury is being transferred to St. Thomas, Ontario. The only luxury cars we have are being built up at Wixom -- Continental, Marks, Lincoln Town Cars. The buying public is so fickle that we have to be fluid in providing manufacturing sources.

Q Back in the late 'Seventies, you've got the downsizing controversy, you've got the fuel crisis, and you've got a crisis? The top man in the Design Center?

A I was in Australia for those early 'Seventies years, and there was the rather grim recession. I left in '73, and the fuel crunch occurred in late '73/'74, and the recession ensued in '75. I can remember coming back on my first home leave from Australia and going into the Design Center, and in that whole lower hall, there were sixty Hamilton boards set up vertically all stashed in the lower hall with the lights turned down low, and it looked like tombstones or a graveyard. It was really a grim feeling around there. And then by '76/'77 when I got back, things had turned up a little and were looking a little brighter.

Q Bordinat is still in the ascent at this point, but there is some waffling going on about Design Center philosophy?

A The Design Center philosophy Gene was always saying, "Bright is right; chrome is my favorite color." It worked like magic for years. I'm not so sure -- I'm retiring the first of January, so I can speak freely -- that a blend of Gene's thinking and Jack's thinking probably would have been more appropriate than what we are now doing. I think we

are almost too avant-garde. This is my own interpretation of the market. I think Uwe Bauhsen and his mob in Europe -- the whole European team -- was transposed into the U.S. We have almost moved too fast into the aero look and sacrificed utility and package room for it. It's a judgment call. A narrow line you have to walk.

Had we been a bit more conservative -- somewhere between Gene Bordinat's philosophy and Jack Telnack's philosophy -- we probably would have been in a better market position. So far, we've done fine. I worry about Taurus and some of the things coming onstream. It's my own feeling about it. They're very, very soft. When we get there -- '86/'87 -- they may be right. Maybe I'm the one that's getting old and conservative. But I have the feeling that there should have been a little more restraint; that we were trying to leapfrog the market and get out there. I have the feeling that G.M., with their more conservative pacing, is probably more right than we are as far as hitting the market at precisely the right time. We may do fine. I hope so.

Q There's a softness appearing?

A Yes, very soft, very aerodynamic. Whether it will catch on and really go, depends a lot on our quality image, our prices, and our marketing. There are so many aspects of it.

Q This ascendancy -- the winning over -- of the aerodynamic philosophy, have you got any information of how that came about in terms of product planning and decision-making at the top?

A I think it came out of sheer desperation. The emissions controls were forcing fuel consumption up and up and up and mileage figures down, down, down. The government was insisting that it go the other way; that



the size of the cars go down, down, down. The fuel consumption of the vehicles improved tremendously and were starting to set targets to hit. The buying public couldn't care less. They wanted their big cars. They enjoyed the better mileage, but aero was just one of the many ways which you could counteract the tendency of emissions controls to degrade the CAFE of the company. It was something that could be done quickly without a great deal of cost. It was just bend the tin in a different direction and do it more effectively. Whereas engine development, transmission development, and emissions controls, the investments required were hundreds of millions of dollars. Whereas the designers could, in a matter of a few weeks or months, skin the car in a way that could be much more effective in terms of aerodynamics. So, when fuel was thirty cents a gallon, no one cared about aero, although there were a few that had a feeling like, gee, if you're going to design it, why not do it efficiently, aerodynamically. The realization was there, but the need that necessitated the invention wasn't there, and it, literally, became a form follows function kind of drill.

Q So far, it's been successful?

A Very successful, yes. It's given us a complete new feel to the vehicle. Very fresh looking. As the cars get smaller, the car sizes have tended to become more of a golden mean. There used to be a lot of difference between a little Pinto and the humungus Lincoln. Now between the Escort and the Mark VII, there's not all that much difference in package. So the challenge to the designer is to continue to differentiate the car lines by virtue of handling the surface and the detail where the package isn't the distinctive thing anymore. So it's become

very challenging in terms of how do you handle the aerodynamics without them all looking the same. And we found that you can have quite a lot of latitude, even in aerodynamics, to tailor and finesse the cars.

Q Were you involved in any of the aerodynamic planning and execution?

A No. Not in the sense that -- I went to the wind tunnels with the various vehicles to work them out, and I had an interest in it, because I was at the University of Maryland where Glenn Martin gave a twenty-two million dollar endowment in the late 'Forties -- excess profits from war production -- and the University of Maryland wind tunnel was being built the year that I left and went to Pratt. So I always had that interest in it.

Q That became one of your chief testing sites?

A That was the first tunnel that we've got into full time on a contract basis with 3/8th scale models. And then we've gradually gone to LTV and, most of the time, to the Lockheed low speed wind tunnel at Marietta, Georgia, for most of the testing and got a slow scan TV and a telephone line hookup to monitor the development down there. The designers, of course, worked intuitively with the aerodynamics. And then aero guys would take the models down to the tunnel, and we soon found that a lot of the intuition wasn't correct. That you could do a lot of things that finesse the models to a high degree in the tunnels and be getting quite unexpected results.

Q An interesting concept is that designers always felt this way. They felt that it was evolution that was bound to come, yet were being continually thwarted by marketing specialists and product planners?

A The magic words back there in the 'Fifties and 'Sixties was "fill the cube. Give them a more roomy car. Make the car bigger, and bulkier,

and get a bigger bang for your buck." A lot of the old cliches. We just got horrendous size vehicles. Out of all proportion to their utility, although the U.S. demanded big cars for long distances.

But the CAFE constraints, the fuel embargo and things like that, made these objectives obsolete.

Q CAFE is?

A Corporate average fuel economy, which is something that is mandated by the government, has really put a lot more sense into the cars as far as this "bigger is better" syndrome, which can get out of hand.

Q The government mandate forced you to make this quantum leap into aerodynamics?

A Very definitely. And also the safety requirements gave us an opportunity to do things which we never could have done previously because of the cost constraints. But you had to do them, and, consequently, the cars cost three or four times as much as when we had the constraints on. Not all of it evolved because of safety, but because of inflation and a variety of factors. But we would have never had wall-to-wall, all-plastic instrument panels in the cars except for safety. There are many things that we would not have had today were we not challenged by the mandates -- both environmental, governmental -- of the safety regulatory agencies.

Q Your career has taken an interesting turn at this point. You moved into an area which had been largely fairly stable, in terms of design concepts, and yet you've obviously been involved with some interesting design projects?

A Oh, yes. Truck design and the vans are coming on very strong, so the Aerostar van is quite a challenging thing. The theme of it evolved,

basically, in Don Kopka's area, but I inherited the production vehicles, and it's going to be an interesting vehicle. Even that has a coefficient of drag of .38. Years ago, the trucks had 5.5, and the cars were 5. Now we have a little van that's .38 C of D, and the Thunderbird is .35. So, there's been great strides forward.

Q This is beyond Ken Spencer's old Minimax?

A Yes. The Minimax was very square. The little Chrysler job is virtually a replica of the Minimax concept, and the Aerostar van has gone beyond that.

Q Can you give us a background as to how you inherited this particular program or pushed it forward?

A The Aerostar?

Q Yes.

A I backed it up some. In the feasibility workout there's a great void between the advanced concepts and what you can actually implement in a production way, and yet, in a sense, we lost a bit, but we didn't lose the theme at all. They've maintained a fairly good aerodynamic van out of the initial concept.

Q You have good expectations for this model that will be introduced in the Spring of '85?

A Yes. It should be in the Spring of '85 that the Aerostar is introduced. It's late, but it'll carve out, ultimately, a pretty good niche in the market.

Q They've had some mechanical problems, but not design problems?

A No particular design problems. They've had some problems with -- one thing about slippery automobiles is they start showing suspension

deficiencies right away, cross-wind handling and things like that. When you trim them low in the rear, you can get into trouble more quickly. With any sophisticated thing, you can get into trouble more quickly than the unsophisticated. It's simply an evolution of that.

Q Mr. Boyer, can you sum up your design philosophy as it evolved over the years and how it was translated into the products that you were involved with?

A Basically, right from the '55 'Bird on, I had a strong desire for a very clean, simple style of design. I was always much frustrated by overworked sheet metal. Pods and booms and bombs that used to get put on the sides of things always struck me as being extraneous, and yet they had their function in terms of marketing and creating interest. But my philosophy is still a tendency to want a clean, simple form, one that's pure and functional. That's not unique to me. Most designers are not chrome oriented, but there's a necessity for car line in series distinctions that have to be made and ways of identifying themselves.

Q Much like the original Thunderbird?

A That's right.

Q Would you say that the current evolution of the Thunderbird is really an ancestor?

A Yes. I'd say it's an ancestor done with much intuition and little technical help. The latter day creations are much more technical often and a matter of integrating of all these things that are required today in the vehicle's design.

Q You see the aerodynamic concept continuing in the next decade?

A Oh, I do, very definitely.

Q And you're happy with the results of your labors over the last thirty years?

A Oh, yes. I would have been doing something like this just for fun if Ford Motor Company hadn't been paying me. I would have found a way to do it. So I feel marvelously well rewarded. The fact that I could have had all the fun I did and have Ford foot the bill at the design center is just a remarkable thing for me.

Q What of the Ranger and your input on that?

A The little Ranger? I really didn't have too much input into it. I was doing mostly interiors at the time when the Ranger was done, so I had input into the Ranger's interior. The exterior, I will not have much input into the that until '85/'86/'87/'88 because of the time frame in which I've been working. The '87 F-Series, '88 Ranger -- I'll have a lot of input into those vehicles. And they, likewise, are being influenced tremendously by aerodynamics -- fuel consumption considerations. So it all ties together.

And even the heavy truck -- they're going to be much more aerodynamic -- there's tremendous savings. There's a hundred percent savings in fuel consumption that can be achieved on heavy truck -- long-haul, line-haul trucks. So there's great opportunities for the guys to do some real things there.

Q Thank you, Mr. Boyer.

A Thank you. I've enjoyed it.

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