

# DEVELOPING THE TORONADO

CAR OF THE YEAR TAKES 3

by Donald MacDonald, *Editor*

**STYLIST GEORGE WALKER** aptly compares the automobile critic to a baseball fan. "If you'd only drop your hot dog and come down and play ball, we'd have a great team," Walker will say in answer to comment on his designs, constructive or otherwise.

But in Lansing, Mich., these days, the critics, Oldsmobile engineers, stylists, and even the latter two's counterparts in other companies are in rare and happy agreement that the Toronado is an inspired car indeed.

GM Styling Vice President William L. Mitchell, who oversaw the project since its inception, explains: "To me, inspired designs are the best designs — ones that move fast from original concepts to conclusion. And that's the way the Toronado program went."

In fact, the Toronado stems directly from a game that stylists everywhere play as respite from the tensions of facelifting the bread-and-butter models year after year. Just when a handful of clay is about to be lobbed in anger at a fellow worker instead of applied to the model, the chief will come in and order his boys back to the drawing boards. There, instead of the dreaded "... let's do this one over again," the command is "take a week off and doodle your own personal dream car — one you'd like to own."

Today's Toronado is a composite of one such session in early 1962, when the design team was putting the finishing touches on 1964 Oldsmobiles.

To indicate how early even 2-years-ahead models become "used" in a styling studio, look at the vintage sketch of Assistant Chief Designer David R. North's dream car and note how closely it resembles what years later became the Toronado.

With a unanimity that's rare among artists, most of the ideas were compatible enough to be incorporated into a single sketch now fondly remembered as "that flame-red car." It was one of the rare ones among thousands that styling management immediately recognized as a potential product. Also, it was Oldsmobile's property, coming at a time when this worried division knew non-kissing-cousin Buick had a winner in its upcoming Riviera.

It was in Bill Mitchell's opinion (the one that really counts around the GM studio complex) good enough to be immediately converted into full-sized clay. Mitchell assigned the project to Advance Studio 3 where, while still under the supervision of Oldsmobile designers, it could proceed in needed isolation from the flurry of production design activities.

Unknown, meanwhile, to the designers was a separate project in Oldsmobile Engineering to initiate a front-wheel-drive



*Oldsmobile designer David R. North works on one of many hundred preliminary sketches of Toronado to develop final theme.*



*Clay modeler details prototype Toronado. These craftsmen work to .01-inch accuracy with special material costing 37¢ a pound.*



Drawings by different stylists depicting their versions of the "ideal sports car" showed a surprising unanimity of line.



Oldsmobile engineers disguised Toronado running gear under cobbled Dynamic 88 body. Sharp teen-agers still recognized it.

program. The engineers sent preliminary layouts of the mechanical prototype to Styling, and the marriage of these to the flame-red car and its rapidly developing clay model was as commercially natural as Ringo Starr's aversion to barbers. The original design parameters of a car you could drive wearing top hat or brain bucket, with a long hood and chopped deck, were strengthened considerably by the stipulation of front-wheel drive.

The seating advantages offered by front drive go far to repay the added cost. Middle passengers in both seats aren't draped uncomfortably around transmission and drive-train humps. And the absence of a bulky differential and axle assembly in the rear allows stylish truncation of the trunk without sacrificing capacity. The Toronado telegraphs its front-wheel character as plainly as Gordon Buehrig's 810 Cord, and paradoxically, both started out as conventional-drive concepts.

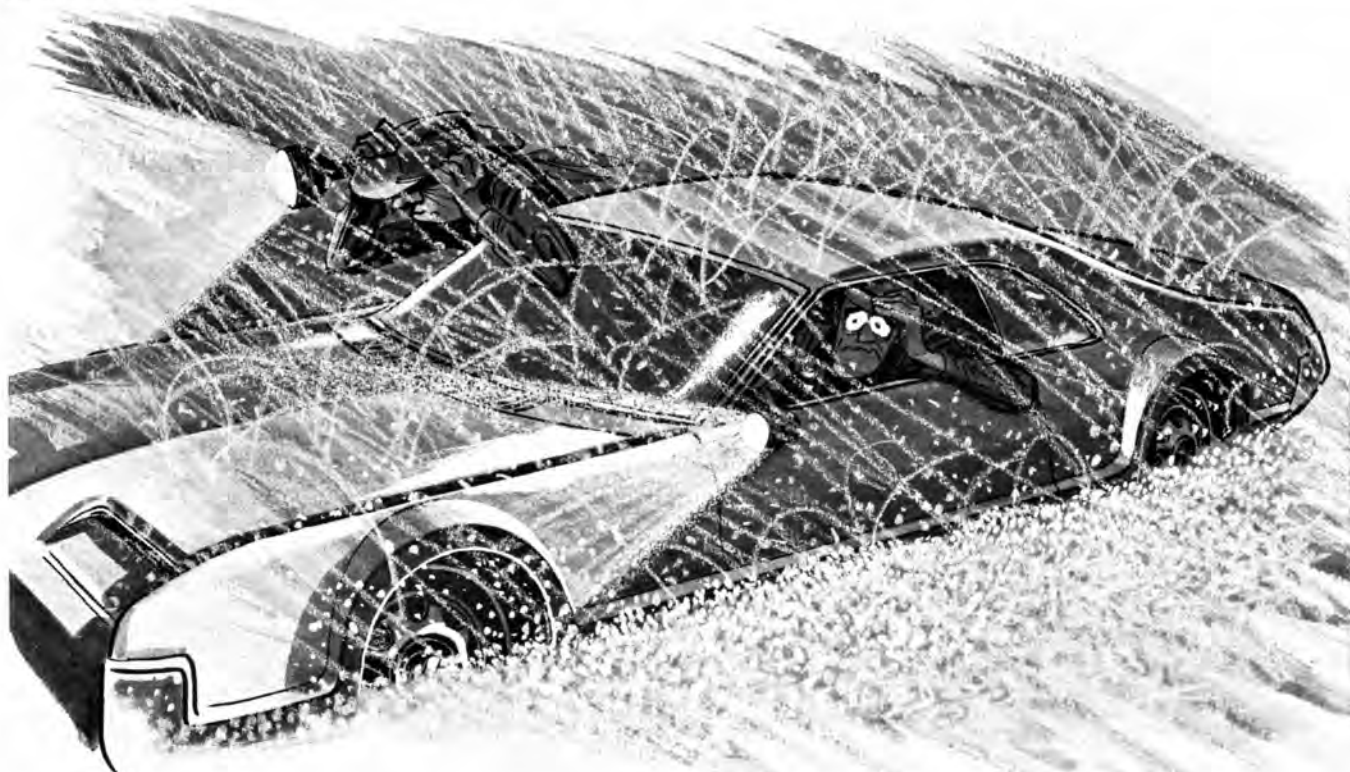
Every member of management considers himself a stylist,

so it's a good thing that modeling clay is pliable. Skilled sculptors meticulously shape a roof or a fender to an accuracy of .01 inch, only to have it unshaped by the wave of a vice-presidential arm. About the only inviolable items are the real tires used on these models. Aluminum foil is handy to simulate chrome trim, and the appearance of glass comes by a covering of plastic sheets.

On a cold winter morning in February, 1963, the clay Toronado prototype was shown to non-styling management for approval of the general theme. True to form, it was back to the mines to lower the belt line, lengthen the rear deck, and raise the roof for more passenger room. Even the tires caught it this time — their diameter was increased for emphasis, which in turn required re-engineering some running-gear clearances.

The Toronado's revival of the one-piece front-door glass was the result of wind-tunnel tests on a 1/4-scale model. And meanwhile, interior designers were hard at work on seats and the dimensions between, a "driver podium" instrument cluster

CARTOONS BY ALEX TOTH



Test driver Unser under bombardment.



TRAINED EYES OF CLAY MODELERS TAKE SHAPES DIRECTLY FROM FULL-SIZED RENDERING, WHOSE LINES ARE CHANGED ALMOST DAILY BY VIP'S.

#### DEVELOPING THE TORONADO *continued*

to take full advantage of the front passenger room offered by the flat floor, and such details as incorporating air-conditioning ducts into the heater, or vice-versa. To give an idea of the design complexity in just one component of an automobile, more man-hours are spent on an instrument panel than in the complete design of a household refrigerator.

The full-sized clay was being changed constantly during this period, which carried well into 1963. Finally, Mitchell felt that he and his staff were ready to call in management once again. This wasn't the point of no return, but it was a point at which several millions of dollars had already been spent.

Meanwhile the engineers, under then-Chief Engineer and now-General Manager Harold N. Metzger, were keeping pace. By April, 1963, Styling got management approval of the clay, and everyone was firmly committed to front-wheel drive. Project XP-784 was on the road to production. It was coordinated at the working level by Andrew K. Watt, Oldsmobile's advance design engineer. For him, it was a labor of

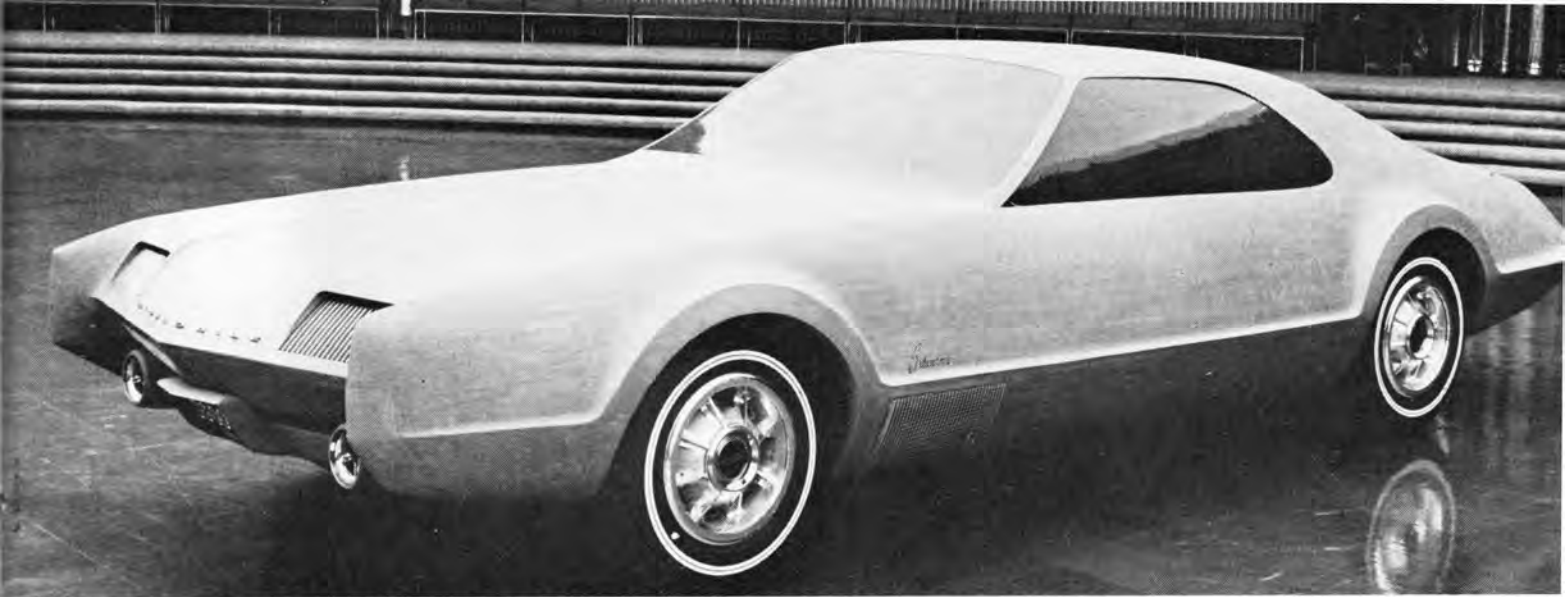
love, because nothing much had happened for many years in Olds advance design department. The division's image of daring unorthodoxy, so firmly established in the years before World War II, had been boosted since then only by the original hot Rocket 88 of 1949 — and that was only an engine in a Chevrolet body. Much of the purpose of the Toronado, in fact, is to re-establish Oldsmobile as the car to copy 2 years later.

Early road-testing of the mechanism took place in 8 cobbled 1963 Dynamic 88s. These attracted little public attention on the highway except from the rare buff who noticed the unusually long hood. By October, 1964, though, 4 hand-built prototypes that closely resembled the real XP-784 were necessarily venturing out of the proving ground for testing which, combined with work inside the fence, ultimately amounted to over 1.5 million miles.

Engineers driving camouflaged Toronados were under instructions never to let the hood be raised in a gas station or parking lot. But it's perhaps testimony to today's knowledgeable breed of young service station attendant that no 4 cars in existence had more offers of an oil check. In many such



"Hell, I didn't want to check your oil anyway. I know it's a front-wheel drive."



EARLY PROPOSAL SHOWED ESTHETIC PROMISE BUT LACKED SUFFICIENT COOLING AREA, PRACTICAL BUMPERS, AND ENOUGH SPACE FOR LUGGAGE.

encounters, the attendant would shrug and say, "Well, hell, I know this is an Olds front-wheel drive anyway."

The prototypes were often referred to as "Tornados" by outsiders — a mistake perhaps generated by MT's managing editor, who at the time had to be clubbed into not removing the middle "o" from the correct Toronado. The name, incidentally, has no particular meaning, much as "88" and "98"

have no special significance — they're nice-sounding numbers.

General Motors maintains an extensive proving grounds near Mesa, Arizona, and much test mileage was accumulated here. This place is, however, an abandoned airfield and therefore quite flat. It offers the best in heat and dust but still can't compare with venturing forth onto the Arizona highway system.

*continued*

*Phlegmatic Indian wouldn't even  
ugh at Toronado test cars.*





NOVEL EXHAUST TREATMENT FAILED TO MATERIALIZE ON PRODUCTION VERSION, BUT THE VENTLESS FRONT WINDOWS WERE FINALLY ADOPTED.

#### DEVELOPING THE TORONADO *continued*

So on many occasions, the cars frequented the rutted roads of nearby Indian reservations. It was a true disappointment to Olds engineers that the phlegmatic Navaho paid no attention whatever to America's newest automobile. Certainly many of them could afford the car, because sticking up from every mud hut was a bright TV antenna, and parked in front was an equally bright and new pickup truck.

About this time, the most dangerous exposure occurred when a team of Oldsmobile test drivers ran head-on into the 1965 Mobil Economy Run, complete with some 100 auto writers in tow. From here on in, the Toronado was no longer much of

a secret. There are those who say that the Toronado was the best planned leak in the history of automotive press agency, but the fact is that none of this was intentional.

After the Mobil incident, GM staffer R. T. Kingman, a knowledgeable sort noted for a sense of corporate humor, promptly wired Lansing headquarters as follows: "Please note that Economy Run newsmen identified Oldsmobile Toronado at southeast corner of Four Corners Monument. This breach of security, therefore, is not the responsibility of the Los Angeles region, but of Harry Blair of the Dallas region."

Aside from some Miller-built race cars that were never driven on the highway, the Toronado is alone in its capability of creating screech and rubber smoke from the front tires. It's an odd sensation for both driver and onlooker, besides



*Fortunately, Unser's driver's license had expired.*

being a clear clue to the identity of the camouflaged test cars.

These cars, of course, were an irresistible target for local hot rodders, and it can't be claimed that Olds engineers always followed instructions and ignored the challenge. One time near Lansing, where teen-agers are particularly alert to experimental cars, the contestants were out-accelerated by a Ford that had "Michigan State Police" painted on its doors. The uniformed winner was the only one who made money for that day's work.

Another brush with the law occurred near Pikes Peak. Race driver Bobby Unser had been hired to prove the engineers' suspicion that the Toronado was a true mountain goat. The test car, for some reason, lacked a muffler as well as lights and was, therefore, being towed in from Denver. Unser, incapable of approaching his favorite hill so slowly, unhitched, fired up, and headed for home with noisy verve. He, too, soon attracted interested, uniformed attention and was stopped. Fortunately for the security of project XP-784, Unser's expired driver's license diverted the law's attention from the ill-equipped prototype car.

Unser's troubles weren't over on this particular trip. The car lacked every creature comfort, including windshield wipers. The much-publicized inclement weather that made much of Colorado a disaster area early in 1965 moved in, and Unser found himself in a hailstorm. Pressing on regardless, he drove for miles, head out the side window without benefit of a protecting vent to ward off marble-sized, hard raindrops. He was in no mood for the lame humor of his navigator who later, in the warmth of a motel, quipped: "That leg was beyond the 'hail' of duty."

Meanwhile, back at the laboratories in Lansing, equally dramatic problems were being solved with less risk of exposure. Fortunately, engineering development of the Toronado was comparatively unrestricted by styling dictates. This isn't to say that Olds engineers were free to go off in any direction they wanted; there were certain basic limitations — the car had to be completely distinctive and mustn't inherit any of the known, past disadvantages of fwd. An obvious goal was reliability that would refute, on the record, any innuendos sure to be planted by competition. The memory of the up-front-where-it-belongs campaign against the rear-engined Corvair was fresh in everyone's mind, as was the knowledge

that competition even within the GM family wouldn't hesitate to capitalize on the slightest flaw.

For these reasons, early engineering concepts were actually less radical than the final design. The engine/transmission combination was placed every which way before the decision was made to split the torque converter and the planetary gearset, then to place the latter alongside an offset engine. Nobody had ever thought of this, much less done it before. And the idea was almost abandoned because the initial attempts to drive the separate transmission components by spur or helical direct-ratio gearset proved inherently noisy.

It was easy enough to say, "Let's do it with a chain," but anyone who remembers the old Mack or Sterling trucks, or the Frazer-Nash sports cars, knows also that chains aren't necessarily quiet under load. Early attempts to silence the unit involved random cutting of the gear teeth upon which the chain rode, but unfortunately, existing profile milling machines can't cut consistently at random. Almost at the desperation point came the happy solution of introducing a thin section into the support that allowed one sprocket to deflect under load. This solution to noise, plus a drive efficiency rated at an amazing 98.5%, might well augur a return of the old F-N "chain gang" as a method of connecting the propelling unit to the driving axle in vehicles.

It's doubtful that the current crop of Olds engineers has ever been involved in the design of anything but a hypoid differential. The old spiral-bevel design, where the driveshaft enters the center of the differential housing, has been abandoned for years for the obvious reason of lowering the height of conventional-drive cars. But with fwd, the hypoid design causes ground clearance problems, so it was back to musty textbooks for the XP-784 team. In no textbook, new or old, is there anything like the oil pan on the Toronado, which had to be contoured around such miscellany as driving axles and steering linkage. Then the oil had to be dredged up from the resulting pockets without excessive foaming from pumps and baffles.

In fact, Oldsmobile Press Agent Jack White has a clear-cut case against the charge of leakage. There were moments as recently as this year when it looked like there might not ever be a producible Toronado. /MT



*Newsmen deserted Economy Run to chase strange car that smoked from front wheels.*