When You Ride Tomorrow’s Airplanes, You’ll Thank Dick Whitcomb

By Barbara Rowes
Dick Whitcomb drives up from Hampton, Va. to Washington maybe once a month ("I stay at the Hamilton, 'cause it's nice and cheap"), in his 7-year-old red Volvo, to do business with his bosses at the National Aeronautics and Space Administration headquarters.

Sometimes he comes to see a lawyer, because Dick Whitcomb is in the middle of a 10-year span of patent litigation with giant General Dynamics over the alleged use of his "inverted canoe" design in the Convair 990 transport fuselages (the case is presently before a federal district judge in Norfolk).

But the trips are rare because at age 48 Richard Travis Whitcomb is too busy doing what most every youngster who disappears for hours on end into the family basement to build model airplanes dreams of doing someday — changing the shapes and looks of American aviation to his own private design dreams.

Dick Whitcomb has been singularly successful at this singular vocation. He has made two aeronautical design discoveries which have helped push the American airframe industry towards supersonic superiority for generations to come.

He is one of those fortunate enthusiasts who has to be chased away from weeks on end of 16-hour days in his $8 million transonic wind tunnel at the NASA Langley Research Center, where he is in charge of 50 employees. He is one of the few U.S. aeronautical scientists who has nearly carte blanche on letting his design ideas take him where they want to go. ("We have to turn off the electricity to get him out of there," says one friend).

Although his friends think of him as a New Englander, Dick Whitcomb is a native of Evanston, Ill. He was influenced early by a grandfather who left farming to become a manufacturer of vending machines.

Whitcomb admired the old man's independence and drive — plus the fact he was acquainted with Thomas A. Edison. "I used to sit around," Dick Whitcomb recalls, "and hear stories about Edison. He sort of developed into my idol. But the days of independent inventors are just about past. With wind tunnels costing $8 million to build it's impossible to do anything completely on your own."

"I decided early in life, that I didn't want to work on someone else's problems. I could do that now and make twice my salary in industry. But here at NASA they pretty much consider me a creative person. So they leave me alone to create."

In 1943, on graduation with honors in mechanical engineering from Worcester (Mass.) Polytechnical Institute, Dick Whitcomb was intrigued by a Fortune magazine article extolling the research facilities at Langley Field. He soon found himself working on design of the B-29 bomber and other wartime planes at Langley. He has been there ever since.

He is a handsome man who enjoys that kind of intellectual solitude that outsiders sometimes mistake for loneliness.

In recent years, his increasing fame and the industry-wide respect he has gained for his intuitive genius in transonic studies have tended to draw him out socially, though he cheerfully admits he'll never be mistaken for a Rotary or Kiwanis enthusiast.
In 1954, according to his longtime friend and boss, Laurence Loftin (assistant director of the Center), Whitcomb, on intuition alone, applied a mathematical curiosity called “the area rule” in wind tunnel tests he was conducting — without ever having heard of the area rule.

As a result, he devised a fuselage configuration that enabled high-speed planes to pass through Mach 1 with a considerable increase of power. The design has become known as the “coke bottle” fuselage and is in use on all supersonic planes today.

“I had the idea,” recalls Whitcomb, “as early as 1951. It was like a bulb lighting up but it wasn’t out of the blue. I put the fundamental transonic theories of Adolph Buesman (one of the German scientists who came to America after World War II) to work and experimented by testing my streamlined models in the transonic wind tunnel at Langley. It was like Archimedes shouting Eureka when Buesman said ‘This is it!’ But it was really only the beginning. In most cases I had to convince top management that my discovery was worth changes involving billions of dollars in aircraft design. For example, before the F-105 was approved, a vice president of Republic Aircraft came down to examine all available data. We spent the whole day together discussing the area rule concept’s application. It’s rough getting management to change anything that involves so much money. But this is all part of my job as a modern day inventor.”

That discovery won him the 1954 Collier Trophy, the highest industry award. Over the years the Collier has gone to people like Glenn H. Curtiss and Orville Wright and Elmer Sperry and Glenn L. Martin and Howard Hughes and William P. Lear and astronaut teams.

This year, 15 years later, Whitcomb devised the “supercritical wing,” a design which would enable present sub-sonic jets to reach nearly Mach 1, instead of the 85 per cent efficiency they now operate on. This means cutting nearly an hour out of the present 5-hour transcontinental flights should commercial liners adopt the new wing (unlikely until new models are born, his NASA co-workers say).

In most years, this second major discovery would put him in line for a nomination for a unique second Collier trophy. But this is the year man walked on the moon and few in the industry think it will happen — though many are sure Dick Whitcomb will receive one of the 50 or so annual nominations from his peers in the airframe industry.
up in the finest room—all expenses paid. The aviation industry’s banquet, involving about two thousand people, was held at the Sheraton-Park Hotel, and I was a guest of honor along with ambassadors and ministers from foreign countries. It was the highest point in my life, except that I had forgotten my suspenders at home so I had to pin my shirt to my pants—and that’s how I faced Vice President Nixon as he introduced me to the world.”

Whitcomb also received the Exceptional Service award from the Air Force (its highest civilian award); a Distinguished Service Medal from the National Advisory Committee for Aeronautics (NACA was NASA’s pre-Sputnik predecessor); some lines in Who’s Who; and an honorary degree from Worcester Tech which permits Dick Whitcomb to call himself “Doctor” at those interminable industry conventions where people who invent coke bottle fuselages find themselves. “It depends on who you’re talking to,” he says. “I don’t use it with my friends.”

He also remembers wryly that he received an increase in dinner invitations “from neighbors I had never even met and have never seen again.”

Says Loftin: “Dick is not a mathematical theoretician in the accepted sense. He is much more intuitive, which is very unusual in scientists. And it has paid off handsomely. He has a new idea every day. I’d say he’s one of the most fertile innovators in the business.”

Adds Ed Cortright, the research center director: “One of the great differences about Dick is that he not only gets a bright idea but pursues it with a great persistence. In our business most publish an idea and let it disappear. Dick’s working in transonic, which is an area where theories just break down. So you have to think of him as something of an artist. He injects some of the elements of art.” (Loftin remembers that in the supercritical wing work, Whitcomb often spent days with a file and other instruments working on the wing edges along with the model makers.)

Sometimes, to an outsider, it seems that one of America’s leading aeronautical scientists has paid considerable dues for his astounding success by defining his life in terms of his work.

“People are always saying that I ought to have ‘more fun,’ ” says Dick Whitcomb. “What they don’t understand is that I am having fun. My work is my fun. Can’t they understand that?”

He rises at 7 a.m. five mornings a week and reads the local newspaper as he traditionally breakfasts on orange juice and toast. “I have sugar and cream in my coffee in the morning because I need the energy,” he explains. “Later in the day I’ll have two more cups of coffee black because I need it as a pick-me-up.”

He has never, he says, missed a day of work because of illness or the unforeseen.
Dick Whitcomb does most of his work right in his office, which resembles a metallic wasteland. His desk is crowded with manufacturers' models of the F-105, F-111, F-4. He doesn't believe in decorating: "It's strictly for work."

"When I came to NACA, (fresh out of Worcester) I started proposing new ideas right off. My boss was very understanding; he listened. But he never found the time to get my ideas tested. Now I'm the head and the difference is that my ideas get tested."

There's also a difference in the amount of his paperwork, the number of his meetings and the bureaucratic tape which accompanies new ideas.

"My desk is filled with stuff that's accumulated over the last week. The most current stuff is on top, the rest I throw into drawers," he says.

His days vary according to the progress of his tests. When he has a model in the Langley wind tunnel, he stays with it for a 16-hour stretch, getting his hands dirty with the mechanics who often play sly practical jokes on him. (An example: a dead bird placed on his desk by a mechanic to depict a supercritical wing that didn't work).

After winning the Collier Trophy in 1954, he became deeply involved in a national effort to build a supersonic transport airplane which would travel 1,500 miles an hour. He also had a private research laboratory in which he worked nights and weekends, after putting in 8 to 10 hours in his office, in order to invent something outside of aerospace. But he was unable to sell the automobile industry a more efficient exhaust system for their engines. He would like to see application of aerodynamic principles used in the problem of car air-pollution — and Dick Whitcomb intends to get busy on this idea any day now.

He did develop a means of making sailboats go faster, though he's sold his own 20-foot "Battery Park" model boat.

Finally, this year, Whitcomb directed a committee of 13 scientists who developed the supercritical wing (in which the cross-sectional shape of the wing has been redesigned for smoother airflow and faster speeds).

"I modified the shape of the wing myself as we tested it," he says. "It's just plain easier this way. In fact my reputation for filing the wing's shape has become so notorious that the people at North American (which will build a test plane next year for it) have threatened to provide me with a 10-foot file to work on the real airplane also."

But the most astonishing reaction to the new invention came from a group of fourth graders who had read about Whitcomb in their Weekly Reader. They wrote so many letters that the NASA office finally had to compose a form letter which answered all their questions about the wing. One of the children even phoned Whitcomb directly.

Right now he's very busy wrapping up the business end of his wing. He spends hours in staff meetings preparing to face management with proof of the invention's worth. "There's a lot of detail work and persistence required to get these inventions on the planes. That's the business. No one meets me at the airports in Los Angeles or Washington. I have to regulate my schedules to commercial flights and management's convenience. There's nothing glamorous about the selling end of this business. But it's necessary to wrap things up."

In the last few months he's been very busy wrapping up the supercritical wing by proving that it affects every aspect of in-flight performance. But he was not too busy to interrupt the meetings and detail plans to throw his secretary Annie a 21st birthday party in the Officer's Club.

"He'd always promised me a champagne party, if I weren't married by the time I was 21. Well, I'm not married, and he didn't forget," she says.

Otherwise, his work comes first. "When I find a problem, I need the solution," says Dick Whitcomb, "I sense it's there and I have to get at it. Although I'll have other things to worry about, I always have this uneasy, irritating feeling. It's a nagging sense that I've got to solve the problem — no matter what."

He sits with his feet up on the desk and continually thinks of work asking "Why? Why?" Insights don't simply spring into his mind. He has to feed it first.

He can't quit work at 4:30 p.m. and relax by watching television or sailing. He is somewhat bitter that other people can put in eight hours and walk away from an office free of concern. He simply cannot turn off his mind through a clock.

"There's been a continual drive in me ever since I was a teenager to find a better way to do everything. A lot of very intelligent people are willing to adapt, but only to a certain extent. If a human mind can figure out a better way to do something, let's do it. I can't just sit around. I have to think."

Dr. Whitcomb dresses for his own comfort in sports jackets, gray pants and colored shirts. He is ignorant of current fashion because he says he wants to be. Appearance doesn't really interest him much.

He doesn't cook for himself anymore. He just got tired of cleaning up. He eats all of his meals out, or at the invitation of friends. At home he just stocks his refrigerator full of snacks.

As a bachelor in the upper reaches of the government pay scale (about $25,000 yearly as a GS-16) he would seem to have both the money and the five-week vacation benefits to travel. He has done so only 3 times: twice to Europe and once to Bermuda. In plain fact, says Dick Whit-
The long drawn-out patent suit has cut considerably into his take-home pay. The first time he went to Europe, he took the conventional Cook's Tour and was appalled by the high tension lines and steel structures throughout Switzerland. The next time he returned to England and France to visit a girl studying over there, and spent much of his vacation touring the aeronautical research centers and examining the scientist Cavendish's laboratory in Cambridge.

"I take very few structured vacations," says Dick Whitcomb. "Actually I prefer weekend trips to Washington and New York, and I'm out on the West Coast a lot for business. I also try to visit my sister with her seven daughters at least once a year in Brockton, Mass. It's not that I don't do anything but work. It's just that I don't take the conventional vacation very much — although I am dying to visit India where the culture is different. I want to see something different. Europe has too many American signs."

Dick Whitcomb has become so busy, in fact, that he has had to lessen his community involvements in the local Peninsula Community Theater association for which he was vice president for business affairs, and the Peninsula Civic Opera Assn. where he was drafted onto the board. His friends are by and large, artists, musicians and from among top NASA management.

He also occasionally wonders why he didn't follow a long ago impulse to enter the field of rocketry in the footsteps of onetime Worcester Tech instructor Robert Goddard.

"Of course," he says, "it would be very romantic to abandon aviation and begin a doctorate in another field. But that's not terribly pragmatic. I can probably do more good by applying my knowlege right where I am."

Says Dr. Whitcomb: "I guess I think differently from most people because I live differently. "My mind's always racing ahead with another project, searching for the new. Sometimes I get mad that I'm made this way. But most of the time my work is just really fun."