

# REMINISCING WITH **BOB HOOVER** Part II

*In February, SPORT AVIATION Editor-in-Chief Jack Cox visited famed aerobatic/test pilot Bob Hoover at his office in El Segundo, CA to tape a conversation with him - a sort of formalized bull session with the sort of questions most EAAers would like to ask a pilot with Bob's fabulous background. The result was a two-part article, Part I of which was printed last month. It dealt with Bob's early flying experiences and some of his more notable World War II adventures. This month in Part II, we move on to his test flying days with North American (now Rockwell International).*

**I**N HIS 45 years of flying . . . as a civilian and military pilot, as a test pilot for a major aero/space firm and as an air show pilot . . . Bob Hoover has had his share of good times and bad. He has flown almost everything that requires a pilot, has been showered with much deserved honors and has made friends in every part of the world. He has also broken an alarming number of bones and spent more of his life in splints, casts, slings and hospital beds than he really cares to dwell upon today. He has lived life in the supersonic lane . . . and on more than one occasion has paid the price for daring to venture beyond man's accumulated knowledge and experience.

It follows, then, that when you ask a man with Bob Hoover's past to pick out the hairiest scrape he ever got himself into, you **know** you're about to be regaled with an honest-to-gosh mind bender.

And you are . . .!

If you recall last month's article, you know my taping session with Bob took place in his tenth floor office in the Rockwell International building on Imperial Highway in El Segundo, California. That's the street that forms the south border of LAX, the Los Angeles International Airport. In addition to being LA's major air line airport, it is home for a number of giant aerospace companies, one of which used to be North American Aviation. Bob went to work for the makers of the Mustang just as the firm was getting into the jet age. He did test work on the FJ-2 and the aircraft that Navy fighter evolved into, the legendary F-86 Sabre. His wildest ride came in a F-86 . . . on take-off from LAX's Runway 25, which he can look down upon from his office anytime he cares to stand up from his desk and walk to the window. In fact, as he was relating to me what you are about to read, Bob would occasionally point out some feature below us that figured prominently in the story - where the old runway ended in 1950 . . . it was only 5,000 feet long then and there was only one 25 . . . there's a 25L and 25R today . . . the hangar he almost hit, etc.

But, we're getting ahead of the story.

By 1950, jet fighters were literally running beyond the capabilities of their control systems. As they edged ever closer to the sound barrier, pilots simply did not have enough physical strength to move the controls to pull the G's needed for dog-fighting in combat. The very earliest jets had been built with strictly mechanical systems and it took a strong armed pilot to turn them at high speed. While at Muroc after the war, Bob flew the Heinkel 162 and found he had to use two hands to make even gentle turns. Beginning with the P-80, hydraulically boosted controls, somewhat akin to power steering on a car, were employed and this helped immensely. On faster airplanes like the early F-86's, however, a pilot was in big trouble if the boost failed at high speed - which happened on occasion.

"You couldn't handle the airplane above 200 knots," Bob told me, "no matter how strong you were."

Thus it was in the late 40's that North American decided the next logical engineering step had to be taken - an irreversible electro-hydraulic control actuation system with no mechanical connections whatever between the stick and the ailerons and elevator. They designed such a system and after sufficient testing, made it standard in the F-86E . . . and all the jet aircraft it built thereafter. All military and big commercial jet aircraft have similar systems today, of course.

To test the system, North American installed it in a F-86A, actuating only the stabilator to begin with. There were two systems, actually, the primary and a backup. Bob recalls that he and his fellow test pilots approached their initial flights in the bird with more than a little concern. The system had been exhaustively tested on the ground, but they had been around long enough to know the best laid engineering plans often went awry the instant they put some daylight between the wheels and the runway. Knowing that when they wiggled the stick, they were doing nothing more than switching some hydraulic pumps on and off was enough to keep the most callous among them wide awake well into the night before their turn in the cockpit.

Much of their relief, however, the initial flights went well. A little work was necessary to provide the proper feel, but that, too, was soon accomplished.

Then it happened.

Bob was scheduled for a test flight and after the usual skull session with the engineers, was soon taxiing out for take-off on LAX's Runway 25. The take-off roll was normal, with the lift-off coming about 2500 feet from the point at which he had opened the kerosene tap. Cleanly off, Bob pulled up his gear . . . and the instant the mains thumped into their wells all hell broke loose!

The airplane pitched straight up . . . and Bob, acting on pure instinct, instantaneously jabbed the stick forward. So hard, in fact, he tore the flesh between his thumb and forefinger . . . then scraped his knees as he jammed them against what had suddenly become an immovable object.

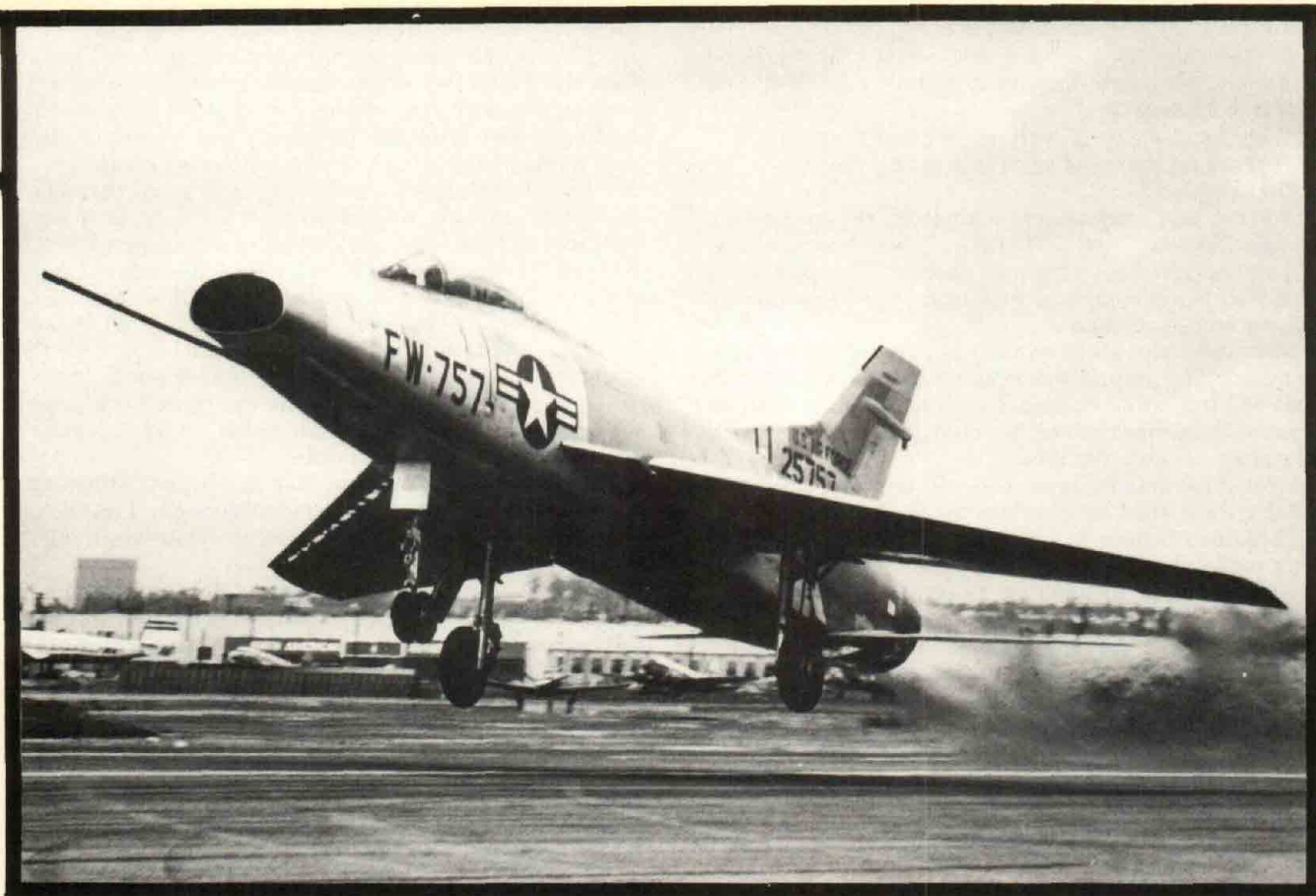
Almost as if rebounding off the frozen stick, Bob's hand darted to flick the "emergency" switch that activated the back-up system that powered the stabilator . . . and got nothing in response. Both systems, primary and back-up, were out. The airplane was heading straight up and completely out of control!

Bob had declared an emergency when the Sabre pitched up and already company personnel were yelling for him to eject, but that took time and altitude he didn't yet have.

With a wing loading of nearly 60 pounds per square foot, the swept wing Sabre stood on its tail for just a couple of heartbeats before calling it quits. It twisted over on its back, pitched down and started to spin . . . from an altitude of no more than 800 feet. By all rights and every physical law of nature, Bob Hoover was about to die . . .

But he didn't.

The only thing he had left with which to save himself was the cable actuated rudder. He booted the Sabre out of the spin and as the rotation stopped, somehow . . . miraculously . . . the wing began to take hold. Grabbing some air, it began to slowly raise the Sabre's nose. With a frozen stick and a windshield full of unrushing runway, Bob was powerless to do more than sit there, instinctively gauging the closure rate as the forces of gravity and the wing's lift battled for the upper hand. At no more than fifty feet, the



(EAA Photo)

balance tilted in favor of lift . . . and the continued existence of the soft, pink bod hunkered down beneath the bird's bubble canopy.

At least for a few more seconds. Coming out of the spin, the Sabre was headed perhaps 45° off the runway heading . . . aimed straight for a big hangar. Completely on its own, the nose was still coming up, but for what seemed to Bob to be interminable seconds, it did not appear he'd clear the roof. The arc was tightening, however, and he made it with a few feet to spare.

Now, the roller coaster began its second climb. This time as it neared the stall, Bob ruddered it over in a sort of exaggerated hammerhead and once again it headed earthward. The fighter had been accelerating, however, and this time the recovery was a little quicker and a little higher than the first one. For the next few heartstopping minutes, Bob continued "walking" the Sabre westward toward the Pacific shoreline . . . with company officials pleading with him to bail out. He was over houses and factories filled with workers, however, and had decided he would stick with it as long as it appeared he had a chance of getting to the ocean. Throughout all the frantic jabbering on the radio, people kept asking Bob if he had hit the "emergency". By this time perhaps the calmest person in the communications loop, Bob finally blurted out in exasperation, "Don't you think that was the very **first** thing I did!"

As he was roller coasting his way west, Bob had begun experimenting with the flaps, dive brake, landing gear and throttle, attempting to achieve a stable condition in pitch . . . and, amazingly, he was able to do it. By balancing the power and drag, he, in effect, made a flying wing out of the Sabre. It felt so good, in fact, that Bob told the chase pilots that were now alongside him he would try to fly the airplane north over the San Gabriel mountains to Muroc (now Edwards AFB). He was again urged to eject, but Bob was beginning to dare hope he might save the airplane. He knew how much it would mean to North American to be able to dissect the bird to find out what

**Bob Hoover's worst accident was in a F-100 Super Sabre. The aircraft shown is one of the early versions. North American's chief test pilot, George Welch, was killed in a supersonic dive test of a short tailed F-100A . . . the price paid for learning the fighter needed a larger vertical tail.**

had gone wrong . . . otherwise, someone else - maybe Bob, himself - would ultimately have to go through all this again, and might not be so lucky the next time around.

Everything went well until the Sabre hit turbulence over the mountains. The delicate aerodynamic balance Bob had achieved was quickly tipped and like a tumbled gyro, the airplane was suddenly all over the sky again. The whole take-off horror sequence was repeated, fortunately with lots of altitude to spare this time, and again he was able to get the airplane on an even keel.

Out over the Mojave Desert, Bob gingerly felt out the Sabre, ruddering it around to different headings and learning just how much leeway in pitch he had to play with . . . all the while continuing to ignore the ever more insistent "bail out!" requests. Ultimately, he made his decision. He had 11 miles of dry lake bed at Muroc to work with and he was going to attempt a landing. He told Joe Lynch, a fellow North American test pilot in one of the F-86 chase planes, what he had in mind . . . and got one last entreaty to hit the silk.

Over Daggett, CA Bob lined up with the lake bed that would become famous thirty years later as the landing place for the space shuttle. Very slowly the power was backed off as Bob sought to maintain the "flying wing" pitch condition, yet get slow enough to affect a safe landing. He knew and was worrying about the fact that the wheels had never been spun up over 210 knots. Would the tires blow an instant after touchdown? Could the landing gear struts take the inevitable side loads that bumps would produce? No one knew, of course, but there was absolutely no doubt about what would happen if any of those things occurred. The fighter would stick a wing into the ground, flip and in a couple of sickening seconds would

scatter itself all over the desert floor.

As the edge of the lake bed loomed up in Bob's windshield, he heard Joe Lynch calmly ask, "Bob, you know how fast you are?"

"Yes, Joe, I know - I'm trying to get the nose up."

"There's no chance of surviving at this speed."

"I know, Joe."

But Bob also knew he was committed. He was passing through 200 feet . . . at 240 knots . . . which was too low to eject and too slow to try a go around. The application of take-off power would certainly send the Sabre into its bucking bronco act, and . . .

Mercifully, there was no time to contemplate the consequences. The ground was rushing by and already Bob could feel the initial buoyancy of ground effect. With no elevator, there was nothing he could do except steer with the rudder . . . and ride it out.

Over three decades later, one still senses a bit of awe in Bob's voice when he describes the touchdown.

"I couldn't believe it. I had no control over it, but the thing made absolutely the most cushioned landing I've ever made. It just **greased** on, as pretty as you please. I was expecting it to destroy itself as soon as it touched, but it just **greased** on that lake bed and I rolled out the entire 11 miles I had in front of me. In fact, I rolled right up on the main base where our company crew was waiting.

"And now I have to tell you the kicker to all this. When we inspected the airplane, we found that all that urging I was getting to bail out was purely academic. Someone had forgotten to take out the ejection seat's locking pin before I had taken off. I couldn't have ejected if I had wanted to!"

But what had been wrong with the Sabre's control system?

"Would you believe - stray voltage! The primary and back-up power systems for the stabilator were common to a single electrical connection, and when the wheels hit the wells, it blocked out the system. The slab tail went to free floating - wherever the aerodynamic pressures forced it. It would just go up and down at will.

"That flight lasted about 40 minutes, but it was the most hair raising one I ever made. I've bailed out a lot of times and have had some nasty accidents, but this one - boy, I tell you, it was a real nightmare! It happened so quickly - and on take-off; it was just sheer luck that got me through that first pitch-up/dive cycle, just missing the ground and the hangar, and again out on the desert when I was too low to bail out."

### Nasty Break

And, so, since Bob had opened the door with his reference to the "nasty" accidents he had had, I forged onward, asking just what his worst one had been.

"I guess the worst one was in the prototype of the F-100. It was the first airplane to fly with the J-57 engine, which was subject to compressor stalls. No one knew what compressor stalls were back in 1954, but we learned in a hurry. In this particular engine, the stall was so violent, your feet would come right off the floor. If you ask any pilot who ever sat up on top of the J-57, he'll tell you it's like sitting on the barrel of a 75mm cannon and having it go off. Fire comes out of the air intake up front just like a cannon . . . it's the most startling experience you've ever had in your life!

"The particular flight in question was to have been the first one during which we fired the 20mm cannons on the F-100. I had taken off from Edwards, heading north toward Inyokern, and at about 42,000 feet I got one of those explosions. I brought the throttle back, thinking I had a fuel line separation and was getting a combustible mixture inside the engine compartment that was torching off. This didn't do any good, however - I kept getting the explosions,

so I stop-cocked it, shutting the engine down.

"Now, in all our work with the engineers before we flew the F-100, we **never** considered the possibility of landing the airplane without an engine. With a wing loading of over 77 pounds per square foot, we felt the sink rate would be too great to make a survivable landing.

"But everything was looking so good to me that I just said that I thought I could manage it - in spite of what had been agreed upon. So, I whistled back toward North Base at Edwards, and still had 20,000 feet when I came over. I was in really good shape, I felt, so I set up a steep turning approach and brought it around to final. Again, everyone was telling me to bail out, but I said, 'No, I'm going to stay with it - everything's looking good.'

"They said they would get the emergency equipment moving, then asked how it was going on final. 'Oh, it's going great - it's a piece of cake!'

"I had the gear down, but then as I began to flare, the controls froze - the power system had gone out. I was doing 285 knots . . . and I said, 'I've lost it!' That was the last thing I said.

"When I hit, the airplane just absolutely crunched itself flat . . . it took out the gear and it hit so hard that the instrument panel came right down on my shins. The impact blacked me out for a moment or two and when I cleared up, I was back in the air - about 200 feet - and standing on the left wingtip. Like the F-86, the F-100 had a mechanical rudder, so I stood on it and by the time I hit the ground the second time, the right wing caught and slammed the airplane down really hard. It stayed down, though, and began to spin around. It made a couple of turns before coming to a halt.

"I was unconscious from that point, but revived when they chopped a hole in the canopy and fresh air started coming through. I told the rescue people not to move me because I thought my back was broken. I wasn't sure about my legs because I was experiencing so much pain, it was hard to pinpoint its source.

"They didn't move me until a doctor got there . . . and I explained to him why I thought my back was broken. Dick Johnson, a test pilot for Convair, had broken his back a few months earlier in a F-102 and had described to me how it felt - like a soft grapefruit or orange, a liquid, squishy lump growing rapidly at the point of the break. As soon as I came to, I could feel the same sort of thing up between my shoulder blades. It was causing me to have trouble breathing.

"The rescue crew took their time and lifted me out of the airplane still in the seat. At the base hospital, I was X-rayed and the report was, 'No, it isn't broken - you can get up and walk out of here.' I told them I didn't feel like walking - that I still thought I had a problem. I told them I wanted to be brought back down to LA for a second opinion.

"They did it, and soon I was being checked into Good Samaritan Hospital. They rolled me over on my side and took an X-ray . . . and, sure enough, found a diagonal break - one that couldn't show up on the head-on (or back on) shot made at Edwards. Boy, that was the smartest decision I ever made. If I had tried to walk, the vertebrae might have slipped along the diagonal break and cut right into my spinal cord!

"The doctor at Good Samaritan said, 'It's a miracle you didn't follow the doctor's advice and walk out of the place.' At any rate, I was out of business for a while after that."

### The Choice

And, finally, I got around to asking Bob what his favorite airplane was . . . a matter of much more than passing interest in the case of someone who has flown as many airplanes as he has. I would suspect that most pilots would assume Bob's choice to be the P-51, so closely has

he been identified with that aircraft over the past couple of decades.

But it isn't.

In case you Mustang lovers are crushed by this revelation, let me first tell you what he **does** think of that airplane.

"The P-51 is a delight to fly, but it has totally unpredictable spin characteristics. When it hits the stall, a wing drops and it's gone. It's not an airplane you want to snap roll or spin unless you have a lot of altitude, and I don't advise it even then.

"My favorite is the F-86 . . . and your next question should be 'Why?'"

Which it was, of course.

"Jack, of all the airplanes I've flown, it's the most honest bird in the bunch. When I say 'honest', I mean **predictable . . . forgiving**. Near the stall, it begins to shake, it 'talks' to you, and when it actually begins to stall, the nose just nods up and down. If you can believe it, I would spin that airplane in the traffic pattern, it was so predictable. I could spin it 25 turns . . . from high altitude, of course . . . and recover on whatever heading you would want - just like that. Absolutely predictable, every time.

"On the demonstration tours I used to make in the airplane, I would come in over the airport at traffic pattern altitude at a real high speed, pull it up into a loop and when I was slowing down at the top, would get the gear and flaps out. Then, while I was still upside down, I'd push into a spin. I'd let it spin a turn and a half, recover and land . . . can you imagine that? That's how predictable it was.

"Now, oddly enough, the military had a lot of spin accidents in the early models. We thought it was a pilot confidence problem and I was sent out to demonstrate what a safe airplane it really was. I was at a fighter base in Boise, ID and flew a demonstration in one of their aircraft,

(Photo by Howard Levy)

**Bob Hoover's favorite airplane . . . the F-86! And you thought it was going to be the P-51, right? This particular airplane is the F-86A in which Maj. Richard Johnson attempted to set a world's speed record during the National Air Races at Cleveland in 1948. A similar A Model with an experimental powered stabilator gave Bob Hoover his hairiest ride in an airplane.**

the culmination of which was a double Immelmann followed by a 5 turn spin. Well, just the instant I entered the spin, I said, 'Uh oh! something's not right.' Boy, that thing went flat as a pancake! I'd never had an -86 spin so fast. I looked out and saw the leading edge slats wide open on one side and racked (closed) on the other. I had started a recovery as soon as I sensed a problem, but it went 6½ turns before I could get it out . . . with not a lot of margin left.

"We found that maintenance on the slat rollers had not been up to par and had been causing the sort of condition I got into. The problem had never occurred on our factory test aircraft. The result was a redesign of the slats - with side rollers so they could not bind up . . . plus a rework of the Air Force accident records to remove 'pilot error' in the instances where the slat problem had been the cause. I personally went through the files with the Air Force at Norton AFB to accomplish this.

"Properly maintained, however, the F-86 was just a tremendous airplane . . . and my all-time favorite."

### Postscript

That ended our tape recording session. Bob had been a most cordial host and had been extremely patient and cooperative as we explored the various areas you've read about the past two months. It was very obvious to me, however, that in our couple of hours of taping, we were merely scratching the surface of this remarkable pilot's incredible career. I asked him if he ever intended to write a book or work with authors who would produce the Bob Hoover story. He has been approached by at least a couple of very notable writers . . . but the problem is finding the time to do the interviews that would be necessary. At 61, Bob hasn't even thought about slowing down and won't. I'm certain, for a long time to come. Someday, I hope he can set aside a few of the off-season winter months to work with an Ernie Gann or Martin Caiden or whomever, because his is a story that needs to be told. The fighter pilot, test pilot and, to a degree, air show pilot . . . Bob has been all three . . . are among the last of the individual heroes we have in our increasingly pluralistic world society. They manifest standards of personal initiative, courage and excellence that mankind could use a lot more of.

