

A Bell Test Pilot Talks

by Chalmers H. Goodlin

Chalmers H. Goodlin's speech before the Dallas/Fort Worth Society of Experimental Test Pilots, The Society of Flight Test Engineers, The American Helicopter Society and The American Institute of Aeronautics and Astronautics, March 13, 1986

"Recollections of a Bell Engineer," an article published in the Winter 1991 Journal, triggered a reaction from a "deceased" former Bell test pilot who was mentioned in that article. Mr. Chalmers H. "Slick" Goodlin, who is very much alive, requested that the AAHS publish his speech given before the Dallas/Fort Worth Society of Experimental Test Pilots, which gives a much different view of some incidents chronicled in the earlier article by Mr. Harry F. Kelsey.

FIRST, I WOULD LIKE TO SAY THAT I AM HONORED TO HAVE been asked to appear here with my old friend and colleague, Dick Frost. If any one person deserves to be made a hero in the XS-1 Program, it must be none other than Dick Frost. Dick is the guy who had the total respect of everyone involved, the engineering and flight testing background to understand the myriad of problems to be faced, and he had the sterling character to accept the enormous responsibilities inherent in such a program. I am confident that both Yeager and myself are alive today because of Dick's untiring efforts. In saying this, I do not wish to minimize the importance of each and every crew member in the XS-1 team, and I am sure that each of them will agree with my comments in this regard.

Dick and I often spoke on the phone about getting together since we last saw each other in New York about 1960. But it took Roy Hopkins, John Williams and the Experimental Test Pilots Association to act as a catalyst and make this get-together possible. To further the pleasure, you have also made it possible for me to see Miggie Woolams and Ruth Frost again whom I have not seen since Muroc days in 1947.

Actually, this is the first time I have been west of the Mississippi since 1964, and the first time I have seen Dallas since 1943 when I was temporarily posted to Hensley Field to

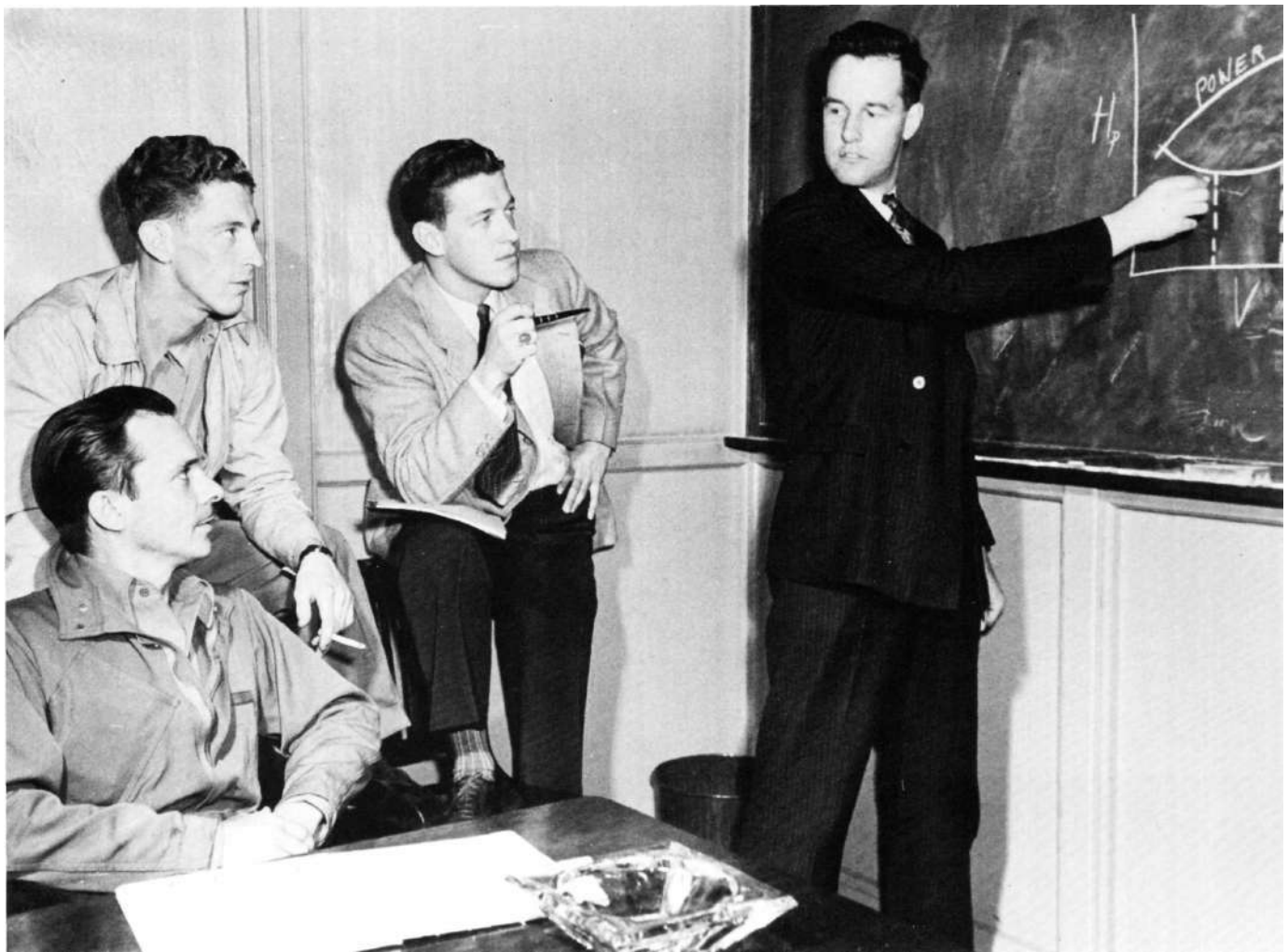
ferry Navy SNJs to the East and West Coast training fields. Big "D" was not so big those days, but the girls were aplenty and beautiful—just like now!

When Red Constant and I were released from the Navy to become test pilots in late 1943, we had the choice to go with almost any of the major companies, but we selected Bell, as it had just announced the first flights on the XP-59, America's first jet-propelled aircraft. In January 1944, we were both quickly accepted, as there was an acute shortage of test pilots experienced in modern fighters of the day—although there was some brief hesitation about me, as I had only recently passed my twenty-first birthday.

We were quickly welcomed at Niagara Falls by Jack Woolams, that great prince of a human being, Tex Johnston, Joe Mashman and the dozens or so pilots on strength at the time. Altogether, the Flight Test Department at Bell was really a great collection of individualists. I remember Sammy Gray, the brilliant electronics wizard, once commenting: "There are no people here, just characters!" Of course, Joe Mashman stood out as the most sedate of the lot. Dick Frost was in [the] hospital recovering from a flaming P-63 bailout, so we did not meet up right away. However, as soon as Dick was back on flight duty, we were destined to work together in numerous programs over the next three and a half years.

The Bell Helicopter Division was mainly Art Young and Bart Kelley at that time. They occupied a couple of bays in what must have been the ground vehicle garage area across the flight line. The great Floyd Carlson was the sole rotary wing pilot. I do not think many of us fixed wing pilots stirred much enthusiasm for helicopters, but that was probably due to the many exciting projects under way in the experimental hangar.

The Bell facility at Niagara Falls was really a beehive of activity those days. Production lines of both P-39s and P-63s were going full blast with most of the output going to the Soviets. In fact, there was a team of several Soviets stationed



March 1945—Chief test pilot Jack Woolams lecturing experimental test pilots on the fine art of flight testing. (L-R) Ed Hensley, Robert Constant and Chalmers Goodlin. (Author's Collection)

Bell X-1 (formerly XS-1) of which six were built.

(Bell Aerospace via Al Hansen)



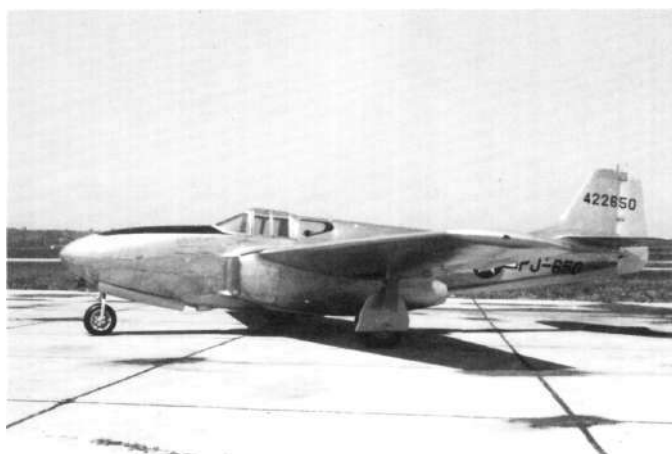
1946—Chalmers Goodlin, with Bell Aircraft and Army Air Corps personnel, inspects fire damage to the X-1 rear fuselage after test flight.

(Author's Collection)



at the factory, including a couple of salty ex-combat pilots. One of them, a squat, bald-headed Krushchev-type, was a superb pilot and proved to be the only guy there who could whip my tail in a dogfight. I did not like that, but he taught me a little humility! About the same time I learned the viciousness of fire in aircraft when I had to bail out of a P-39.

A number of us were quickly checked out in the YP-59s, and Dick Frost, Red Constant and I were assigned to the MX 536 project. It was a major program to reduce the art of remote control flight testing to practice. This was accomplished in a remarkably short period of time, in spite of the fact that, on one occasion, I had both engines cut out on take-off about 200 feet in the air, necessitating an abrupt descent into a very wet, ploughed field. Dick was Project Engineer of the program, and its success led to a similar program with a pair of P-39s for the Navy, and another using an F6F/F7F combination, also for the Navy. I expect this early remote



control work played an important basic role in the interim remote control successes.

During the remote control programs, other existing projects were being carried out at Niagara Falls. We were doing flight tests on America's first swept-wing aircraft, called the L-39. It was actually a P-63 which had the inboard ends of its wings sawed off at an angle and remounted to produce about 35 degrees sweep. Also, America's first butterfly tail was being test-flown on another P-63. At the same time, the initial flight testing commenced on the XP-83, a very large fighter/bomber with a pair of GE I-40 engines. It was shortly to be used as a testbed for the novel ram-jet powerplant.

As the war drew to a close, and the P-39/P-63 production lines came to a stop, the fixed-wing pilot staff dwindled down to Jack Woolams, Tex Johnston, Dick Frost, Joe Cannon and me. This meant lots of flying, and I can remember doing test work on five different airplanes in one day. It was really great fun!

The Bell P-59 Airacomet was America's first jet fighter. First flight was on October 1, 1942, piloted by Robert M. Stanley, Bell's chief test pilot.
(Bell Aerospace via Al Hansen)

Of the 66 P-59 Airacomets produced 30 were "B" models. And 50 Airacomets carried the same first four numbers 4226 on the vertical fin with the other two variable numbers on the rudder.
(AAHS Neg. No. 8844)

March 23, 1945—The P-59 after emergency crash landing on the farm of John W. Binkley, Niagara Falls, New York, when both jets lost power at 200 feet altitude after takeoff.
(Author's Collection)

In early 1946, Jack Woolams came up with the idea that we should enter the first postwar Thompson Trophy race with a souped-up P-39. He sold the idea to Larry Bell, under the condition that an outside company would buy two aircraft and contract with Bell to provide certain technical information for the amount required to fund the operation. Dick and I had a company, called "Skylanes Unlimited," so we bought the two P-39s from War Surplus and hired moon-



CRASH REPORT YP59A-13 (42-108780)

At 14:30 on March 23, 1945, the undersigned was forced to execute a crash landing at YP59A-27-13, AF42-108780. The airplane itself was damaged beyond repair; however, the radio and television equipment is thought to be intact.

The purpose of this flight was to make a takeoff, practice dives from 35,000 feet, return to the field, and land by remote control in conjunction with the MX-536 project.

A complete ground check was made, testing all functions of this airplane by both the mother airplane and the ground control station. Upon completion of this check, no malfunctions of the remote equipment were observed, and both ships proceeded to the southwest (#23) runway. The truck followed, taking position at the intersection of the new east-west runway and the northeast end of the southwest runway.

Immediately following the takeoff of the mother ship, YP59 #16, this ship was taxied into position and the displacement auto pilot was engaged to execute a remote-controlled takeoff by the ground control station. At a predetermined signal from the mother ship, ground control operator Hawley actuated the throttle function. Both units at this time were observed to deliver their maximum power, 16,500 rpm. Due to warm weather and the external wing tanks, the takeoff run was very long, necessitating a run of about three-quarters of the runway. After becoming airborne and attaining an altitude of approximately 75 to 100 feet, the power of both units was observed to fail, the rpm of both dropping to approximately 12,000 revolutions. Up to this point the landing gear function had not been actuated. Immediately sensing a possible forced landing, this pilot attempted to raise the

landing gear and drop the auxiliary wing tanks. The rate of descent at this time was very fast and an emergency landing field was chosen directly off the southwest boundary of the airport.

Due to the fast rate of descent, the landing gear did not have sufficient time to fully retract, resulting in its being approximately halfway extended when the aircraft struck the ground. As was in the case of the landing gear, the auxiliary wing tanks had insufficient time to become detached before the impact. This is due to the tank drop installation in this aircraft, which necessitates a lapse of 7 to 10 seconds after the function has been actuated for the tanks to become detached.

Installed in this aircraft is a system whereby raw fuel is taken from the main fuel line to both units and injected into the burner of the left unit. The valve controlling the injection of this fuel to create smoke may be actuated by the safety pilot, the mother ship, or the ground control station. This smoke is used for the purpose of maintaining visual reference to the robot ship while conducting dives via remote control from the mother ship. When the smoke valve is open the fuel supply to both units is decreased considerably, causing the power to drop off to below 14,000 rpm. Post-flight examination revealed this valve to be in the full open position, obviously the cause for the loss in power on takeoff. To substantiate this, ground observers stated that immediately following takeoff, white smoke poured from the aircraft. The cause of the condition has not been ascertained as yet.

Considerable damage was sustained to the aircraft due to the severe impact upon landing. Although the cabin section remained intact, the fuselage is badly buckled. The left wing, landing gear unit, nacelles, etc., are damaged beyond repair.

This pilot received minor back injuries, but was able to jettison the sliding hatch and walk to Niagara Falls Boulevard where

assistance was given.

The landing was made on the farm of John W. Binkley, Niagara Falls Boulevard, Niagara Falls, New York, without damage to personnel and very little damage, if any, to the property.

The attached photographs of the aircraft give a rough indication of the damage.

The witness report of Experimental Test Pilot Murray Hawley, who was flying this airplane by remote control from the Control Truck on the Airport, is appended to this report.

Witness Statement

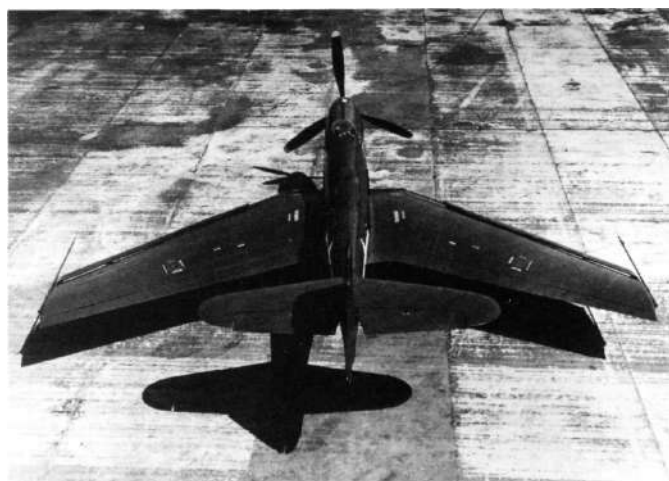
A complete ground check was made testing all operations of the remote airplane by both the mother ship and by the undersigned on the truck. All functions were operating satisfactorily.

Both ships proceeded to runway #23 and the truck took position on the new east-west runway approximately five feet in from the intersection of the southwest runway.

Pilot Constant in aircraft YP59A-16 took off and made a circuit of the field in order to pick up the remote ship when control was turned over to him. Upon his getting into proper position for the pick-up, the throttles on YP59A-13 were opened from the truck and the takeoff started. Due to the external wing tanks, both ships took an exceptionally long run, and after #13 had consumed approximately three-quarters of the runway, he was just airborne after my operating the up stick slightly to get him off the ground.

Upon the remote airplane being airborne, I operated the landing gear switch to the up position which was a perfectly standard procedure in every way. At this point white smoke was visible from my position on the runway and Pilot Goodlin advised he was taking control. He continued straight ahead for a short distance at which time I called him on the radio and told him to drop his wing tanks and after this contact was made he made a slight fight turn and disappeared behind the trees on the south side of the road bordering the airport. I then called the Niagara Tower and asked them to sound the crash alarm if they hadn't done so already, and the truck and crew proceeded to the scene of the accident.

It is my opinion that Pilot Goodlin did an exceptionally fine job of crash landing the airplane, as he had practically no time and no altitude with which to play.



lighting Bell mechanics to ready them for the race. Basically, we stripped out all unnecessary weight, installed the latest -31 Allison engines and P-63 landing gear motors. What performing fool that P-39 turned out to be—off the ground in 600 feet, it would almost climb straight up. Most everybody laughed when we appeared at Cleveland that season, but they did not realize that they were looking at the most power in the smallest package.

We named the aircraft "Cobra I" and "Cobra II." At the outset, Jack, Tex and I agreed that if all three were available at racing time, we would toss coins to see which two could do the flying. I lost—or won—depending on how you look at what transpired. During the qualifying trials, Cobra I's engine was rough, so Jack flew the plane to Niagara Falls to replace the engine. While checking out the new engine over Lake Ontario, the airplane disappeared, and that great, wonderful guy was lost. Tex won the Thompson Trophy three days later in a shoo-in, but, at Bell there was little joy to be found.

Jack, of course, had already done glide tests in the engineless XS-1 at Pinecastle Field, Florida, before his death, and he had been contracted to do the initial tests. Naturally, I expected my senior, Tex Johnston, to automatically take over. But, to my surprise, Larry Bell, at the Cleveland Air Races, introduced me to a New York banker as Jack's replacement.

Back at Niagara Falls, I was given a cram course on the XS-1 by Dick Frost while it and the B-29 mothership were being prepared for the trip west to Muroc. I remember we did one pre-launch shakedown flight test from Niagara Falls to check out the systems and procedures. Pappy Dow was captain of the B-29, and Mark Heaney acted as copilot and the XS-1 launch man. The cool heads of Mac Hamilton, Bill Means and Jack Russell were in play, and the rehearsal went off very satisfactorily. Then, tragedy again struck Bell when Milt Carlson, Floyd's brother, was killed in a helicopter test flight. A day or so later, my flight engineer, Charles Fay, and I were forced to bail out of the XP-83. The four-foot-diameter ram-jet we were testing backfired, breaking its high-pressure fuel line and setting the fuel ablaze as it flooded the wing root. Fortunately my injuries were minor and, after a couple of days' recovery, I was able to carry on as scheduled. That sort of sounds like Walter Mitty, doesn't it?

In September 1946, I was negotiating contractual arrangements with Bob Stanley, Bell's chief engineer, after stipulating first that 25 percent of the \$10,000 bonus Jack Woolams had agreed to for the subsonic XS-1 flight phase was to be given to his wife, Miggie, because of the X-1 glide flight tests done by Jack previously. We concurred also that the bonus figure was grossly inadequate, considering the risks associated with a very temperamental, highly volatile rocket engine in combination with virtually no emergency escape potential. I had no fear of the airplane itself, for the Bell engineers had long since proven their expert design capability. Finally, after considerable discussion, it was agreed that I—or a corporation



July 1946—Tex Johnston, Slick Goodlin and Jack Woolams on the wings of Cobra I and Cobra II, the Thompson Trophy racers, before they were painted in racing colors. (Author's Collection)

1946—The L-39, a modified P-63, was America's first swept-wing aircraft. Chalmers Goodlin made 17 test flights in this aircraft. (Author's Collection)

Bell P-39Q-10 ex-Cobra II is being readied here for the 1948 Thompson race. Then owned by Don Noland and flown by Chuck Brown, a vapor lock in the fuel system forced it out of the race on the 19th lap. (Doug Pirus Photo via Bob Williams)

XP-83, September 1946—On Chalmers Goodlin's 25th flight in this aircraft the plane was totally destroyed in a crash after catching fire during ramjet tests near Tonawanda, New York. Test pilot Chalmers Goodlin and flight test engineer Charles Fay successfully parachuted from the burning aircraft. (Author's Collection)



formed by me—would be paid a total of \$150,000 for my performance on the flight test program, because it was now to include putting the XS-1 through Mach 1. Bob Stanley and I shook hands on this agreement, and it was left to the attorneys to put the agreement into legalese. Having come from farming stock, where a man's word was his bond, it never occurred to me that my agreement with Bob Stanley would not be honored in due course. So, off I went to Muroc with great expectations.

There were no accommodations for the Bell personnel at the Muroc Army Air Base, so we all settled into the old stagecoach stop village of Willow Springs on the edge of the Antelope Valley about 30 miles northwest of Muroc. Though somewhat primitive, Willow Springs reeked with pioneering charm, and we spent many pleasant off-duty hours there.

Our XS-1 flight testing began on October 10, 1946, but we had to abort before drop at 24,000 feet, when a pressure relief valve failure caused the XS-1 cabin pressure to increase rapidly. The emergency dump valve failed to function, and before Mac Hamilton could get the cabin door safety chain attached, the cabin altimeter reading passed 1,000 feet below sea level. When I was finally able to jettison the door, it hit the entrance ladder with such force that the ladder was bent

out to such a degree that I was forced to remain in the XS-1 for the landing, which Pappy Dow made quite uneventful.

Repairs were made overnight, and we got off the first unpowered flight the next day in which I was able to establish stall speeds, clean and with wheels and flaps down and general handling characteristics. The pressure relief valve was again a problem, and we discovered the pilot's oxygen supply was minimal. Total flight time was nine minutes. Two more unpowered flights were made in October during which a number of systems deficiencies were encountered. It was to take over a month to get these problems ironed out. On December 2, we did a ballast flight with half fuel aboard to check out the fuel jettisoning systems.

On December 11, 1946, the first powered flight was effected with full fuel load aboard which gave a gross weight of just over 12,000 pounds. On launching, at 230 mph, the XS-1 dropped like a stone in a full stall condition, but the nose fell straight ahead. When I fired up the first rocket chamber, we were quickly flying with full control. The silence in the cockpit was rather eerie, and one could only detect correct engine function by reference to the instrument gauges. This held true only when the correct mixture of fuel was being burned, for—when I ignited all four chambers—an ungodly howl



March 1947—During the climb to launch altitude, the XS-1 cabin pressure regulator malfunctioned causing the cabin pressure to exceed 1,000 feet below sea level. Consequently, it was necessary for pilot Chalmers Goodlin to jettison the entrance door which struck the access ladder with such force that it was bent outward making it inoperable and unsafe for Goodlin to attempt reentry into the B-29 mothership bomb bay. Therefore, Goodlin jettisoned all fuel and remained in the XS-1 during the landing at Edwards AFB.

(Author's Collection)

from the rear was heard, indicating improper mixture of the liquid oxygen and ethyl alcohol. I quickly shut off all power when the fire warning light blinked on. This was one of those many moments that caused the adrenalin to surge until Dick Frost advised from the P-51 that he could see no evidence of fire. I dumped the remaining fuel and landed without incident, but the pressure relief valve malfunctioned again, and my cabin altitude showed 27,000 feet as the XS-1 rolled to a stop. On examination, a fire had occurred in the tail cone, so remedial action had to be taken.

Obviously, there is not sufficient time to go into detail on every flight. I can only say that one had to call upon every human resource to fly the airplane, monitor all gauges, actuate switches and valves in a timely manner and register data while staying within landing distance of the runway in the flight time constraints imposed absolutely. I think the shortest flight I made was five minutes and the longest 20 minutes.

All sorts of exciting things happened during my 26 flights in the No. 1 and No. 2 XS-1s. One time an explosive sound—like that of a 20mm shell going off—at the rear of the aircraft took place. We never discovered what caused it. During maximum stress tests, when I pulled just under nine Gs in a high-speed accelerated stall at about .8 Mach, I got a call from the ground asking what had happened. They had heard the first sonic boom produced by the XS-1 but thought something had broken on the aircraft. Dick told me to keep the ship to minimum Gs as I slowed up and turned in to land. After I greased it onto the lakebed, they virtually took the airplane apart, trying to discover the structural failure they thought had caused the two sharp cracks in rapid succession they had heard from my abrupt pull-up. So much for Chuck

Yeager's belief that he was the first to create a sonic boom!

During the first few months at Muroc, I received the odd call from my New York attorney to tell me that concurrence on contract points was gradually being achieved with the Bell attorney, but, about March of 1947, I got a call from him to say that he felt Bell was now stalling. I told him not to worry, that I was due to go back to Niagara Falls in a month or two, and we could get things properly settled then. Little did I know that it had already been agreed by Bell and the Army Air Forces that the Army would be supplying their own pilot to do the supersonic flights after the initial flight tests were concluded. I could go on, but since you did not come to hear about this aspect of the XS-1 program, suffice it to say that the end results were: (1) I received only the \$7,500 balance of the original bonus for the initial flights. (2) I was so appalled that Stanley had broken his word with me that, after a couple of heated confrontations to no avail, I felt compelled to hand in my resignation on June 10, 1947. This is the true story of my departure from Bell and the XS-1 program. The allegations in the film *The Right Stuff* and Yeager's articles and book are totally false.

I only met Captain Yeager once. When I returned to Willow Springs after resigning from Bell, he asked me to give him a briefing on the XS-1, which I was more than willing to do as a consultant to the Air Force. So, I have been puzzled as to just why this gentleman, who has received an adequate share of kudos, has seemingly gone out of his way to bad-mouth me personally.

I guess the best way to quickly give you my feelings on the film *The Right Stuff* is to say only that I consider its failure at the box offices and rapid oblivion were richly deserved. It was beneath contempt for its portrayal of test pilots in general and me in particular, and its use of language and vulgar scenes that demean our profession. I cannot help but echo National Air and Space Museum director Walter Boyne's remarks on *The Right Stuff* in his article, "Stuff and Nonsense," which concluded thusly: "How long can we permit debasement on the brilliant human effort of the technological cutting edge? The rumbling whine you hear is not a turbine but all the brave test pilots rotating in their graves."

In conclusion, I think it fitting to pay tribute to you scientists and engineers, fellow test pilots and flight test engineers and our friends, the aerospace writers, who translate our jargon so that the rest of the world learns of our contributions to it. Dick and I are proud to be associated with you in this close-knit clan whose accomplishments over the years can have no better testament than the one I heard the captain of a British Airways Concorde announce: "Ladies and gentlemen, we have just passed through Mach 1, the greatest non-event in the history of aviation!"