(Photo by Erna Stephans)

BOTTOMS UP

By Bill Turner (EAA 26489)
P. O. Box 3427
Riverside, CA 92509

IT'S TIME TO set the record straight. I had hoped with the very detailed FAA analysis available and a number of eye witnesses on hand at the site, some accurate account might surface relative to the crash of my replica 1931 Model Z Gee Bee (June 3, 1979). However, I have read several articles which have been so completely misleading that I must jump to the defense of the reputation of a great airplane.

I was, of course, expecting too much to believe that a plausible report could be transmitted from person to person while each sooth sayer exercised his own editorial license and interpretation. I remember an old Navy adage which challenged anyone to start a rumor down in the double bottom of a ship, then race up the ladders at full speed in an attempt to beat the information topside - and recognize it when you heard it!

This is what has happened in the tale of Number 4's up-ending. I cannot identify some of the descriptions of the events as being the same incident with which I was involved. I have heard that the day was clear, rainy, unlimited visibility, foggy. I approached from the east (apparently through the mountain which parallels the airport's only runway) or from the west (meaning that I was arriving from Hawaii since the Pacific Ocean is on that side of the landing strip). I ran out of gas and bailed out; I made upwind, downwind and crosswind landings and the wildest of all, reported to me by a young man at Springfield, MA, that the airplane had exploded while leading the unlimited race at Mojave!! Grab that one.

It is not surprising that Gee Bee's have caught the interest of the world since their inception. First, because

of their pace setting speed and, secondly, due to the unbelievable chain of bad luck which followed the Granville brothers' products. There are two areas of excitement which people cannot resist, particularly the press - a winner and the hint of evil forces at work. The Gee Bees fill those categories beautifully. Winners they were. Evil forces? Who knows whether evil is created for us or by us? Certainly in my instance, it was created by us.

First, just to get the official statement on the books, let's look at the FAA report. It is seven pages long, six of which are devoted to a variety of forms having significance only to FAA's system of accident recording. The last page is a summary of the inspector's finding and I quote pertinent excerpts:

"Pilot intentionally made a downwind landing on Runway 30 due to the decreasing ceiling north and east of the airport because of the large turning radius necessary for safe aircraft operation. Upon landing he attempted to apply the brakes to maintain directional control. The brakes failed and the aircraft swerved off the left side of the runway, rolled approximately five hundred feet to where it flipped upside down on rough ground approximately one hundred fifty feet from the left side of Runway 30. Wind direction was apparently not a factor in the accident."

The report goes on to confirm that all licenses and certificates were up to date, details crew information, comments on injuries, describes damage to the aircraft, points out that the reason for the flight was to have a new set of brakes installed at Half Moon Bay Airport, then gets to the heart of the problem:

"Examination of the brake system disclosed the brake assemblies were Hays Model G-2-22 Expander Tube brakes. The brake master cylinders were Goodyear Model 511738 master cylinders. Both master cylinders were placarded to use red mineral base fluid. The brake lines adjacent to the brake assemblies were found to contain a mixture of mineral base red fluid and vegetable base amber fluid. The right master cylinder interior and the sealing surface of the pressure cup were contaminated and scored with a gummy dirt. The left master cylinder interior was contaminated with a gummy dirt and the pressure cup was grooved across the sealing surface. The pilot stated he had had brake problems previously, but the brakes were functional when he departed Merced, California."

Who was at fault and where did it all begin? Well, there is no question about who was at fault - I was. I flew a high speed aircraft which is completely dependent upon its brakes during landing roll out, knowing that they were marginal, and gambled that there was one more landing left in the system, but there was not. However, as with any accident, it did not start at the scene of the crash. There is always a progression of circumstances responsible for cataclysmic happenings. An automobile which is struck in the side by another car running a red light would not have been at that precise spot at that exact moment if either driver had altered his pattern of movement a mere fraction of a second at any time preceding the collision, including the decision to take one route over another.

I have had pessimists infer that the chain of events was really set in motion inevitably the day I elected to build "The City of Springfield". Well, maybe so, based on the above philosophical approach, but I think I can identify the problem in more physical terms. The accident had its antecedents in my decision to use a type of brake which could be incorporated within the confines of the original configuration of the wheel pants. To accomplish this feat without adding unoriginal bulges in the aluminum to compensate for calipers needed for disk brakes, we opted for the Hays expander tube type as used on a Fairchild PT-19. The attempt to retain authenticity in outward appearance, a point with which I was in total agreement during construction, nearly cost me an airplane and my life.

From the very first we were aware that the decision was questionable. The Hays brake was just not designed to handle an aircraft with the intensity of a Gee Bee. Ol' Number Four touches down at a faster airspeed than a PT-19 will cruise! Even at low speeds the shoes overheated and locked the wheels. This was remedied by grinding them to greatly increase clearance.

The overheating during taxi was thus somewhat alleviated, but more pedal travel was required and fluid level became critical. Then, during flight testing the brakes set up overnight to the point that one morning the plane could not be moved from the hangar. Improper fluid had swollen the bladders. As the owner, maintenance mechanic and pilot in command, I should have seen to it that at the very least, all components were replaced with fresh parts or, at best, new disk brake units be installed. Instead, the old fluid was drained, the lines superficially flushed out and a new type of fluid was added. Unfortunately, the cups were compatible with red fluid, the expander tubes with amber, a point I was unaware of at the time. The reasons behind my not making the complete change in systems at that time are too complicated to explain in a short article, but the fact remains that I did not - and thus the fault is mine.

The permanent airworthiness certificate was nervously assigned in the Exhibition Category by the FAA after twenty-five hours of flight and I began to venture off to fly-ins and air races in California. I attended three - Chino, San Diego and Merced. At Chino the Gee Bee had not been included on the air show insurance, so it did not fly during the program as planned. The San Diego organizers were more thorough in their preparation and Number Four was demonstrated around the race course each day. The brakes operated adequately at the first two outings, but Merced was a much different story.

The flight from Riverside to Merced was a real gaser. The weather was beautiful. I climbed quickly to about 12,000 feet to clear the rugged, 10,000' Mt. Baldy. I passed a Bonanza that was hurrying along my course and I'll bet the pilot is still wondering if he really saw what he thought he saw! I later calculated my ground speed over three hundred miles and it was 220 mph - into a reported 5 to 7 knot headwind.

The first evidence of real trouble became apparent as I landed. The right pedal seemed soft as I braked hard to bring things to a reasonable speed from the 95 mph touch down. I slowed, turned off the runway, reached the parking area, applied both brakes and did a 360° turn - the right brake was gone. We worked intermittently during the next three days trying to remedy the situation with a piecemeal operation. Had the master cylinders been opened and examined at the time, we could have learned what the FAA discovered in their investigation - the cups were spongy and scored, rendering them virtually useless.

Now, as to the day of incident, no matter what you have heard in the past or will hear in the future about the happenings on June 3, 1979 at the Half Moon Bay, California Airport, believe only this account. I had the best seat in the house for the show and every fraction of a second of the intense episode is permanently etched in my mind.

Erna Stefans, who had driven over to the fly-in from San Francisco, departed about 10:00 a.m. to allow ample time for the drive back. We planned that she would meet me at the Half Moon Bay airport so that I would have transportation home.

About noon I began a ground check in preparation for leaving Merced. I had previously made arrangements with John Herlihey to store the Gee Bee in his very large hangar at Half Moon Bay Airport while new brakes were

(Photos Courtesy Bill Turner)

These views of the upturned Z and its subsequent righting need no commentary . . . it is heart rending to see an airplane in such a circumstance. Fortunately, however, Bill Turner is still around to tell the tale.

being fitted.

The decision was made prior to going to Merced to replace the troublesome units with modern ones - authenticity be damned. Arrangements were set with Dave Forbes, of biplane facing fame, to install a set of Cleveland binders as used on a Beech Baron. The plan was to fly from Merced to the San Francisco area so that Dave could perform the operation on his home grounds. The idea was good, but six months too late.

I completed the surveillance of #4's apparent airworthiness by trying pedal pressure. It was minutely lower than when we had worked on the problem earlier in the day but still returned a solid feel. I decided to give it a try.

Taxiing at Merced involves a long trip to the runway, which allowed considerable opportunity to check the brakes. They seemed all right as I accelerated, slowed, turned and circled. There was, however, a slight spongy feeling which should have warned me, as the British would say, of an impending spot of bother.

Ed Marquart, builder of my "Z", offered to fly home to Riverside, pick up his equipment, return and tear into the problem, but I felt sure that I could squeeze out one more landing from the shaky system and decided to go. Hank Manwaren's last words to me as I closed the canopy was the suggestion that I store the Gee Bee in his hangar on the field and fly home in his airplane. Would that I had taken their offers.

Clearance was given by the tower operator; I rolled out, added throttle in the usual steady but not rapid manner until lift off, picked up more speed, advanced manifold pressure to 32" and climbed into the fly-by pattern. I followed a P-51 past the crowd in a shallow dive indicating about 250 mph, then aimed for Half Moon Bay.

The day was hot so I adjusted cockpit temperature with altitude. At 12,500 it was delightfully cool. The husky 985 purred along, the air was smooth, visibility nearly unlimited and it should have been an all smiles, laid back ride - but it wasn't . . . my mind wouldn't leave the brakes. I tried them again - very soft - a couple of quick pumps brought them up. With the sudden, abrupt dive either left or right that Model "Z" takes about the time the wheels settle on the runway, my thoughts were, "Will I have to pump before I'm too far out of control to save it."

I crossed the mountains that separate the San Joaquin Valley and the San Francisco Bay area. The coastal range ahead of me was hidden by the omnipresent sea fog, and on the other side of those rocks, under the mist, lay Half Moon Bay. A fairly normal condition, particularly in the spring of the year. This is not ground fog, it is a low cloud cover usually offering a ceiling under it of 1500 to 1600 feet. The general practice is to slip through a low pass west of San Carlos, fly down a valley to the coast, turn north and head for the airport. I figured I'd give it a try.

I dropped down to 1200 feet, threaded my way under the fog layer and into the pass. Things were not going to my liking. Instead of the ceiling remaining at the anticipated 1500', it dipped steadily lower in front of me. By the time I reached the coast, the base was near 800'. To the north it was obviously even less. The runway was in sight so I elected to head for it, losing altitude steadily and rapidly to stay out of the clouds. Model Z's instrument panel is equipped with a gyro compass and artificial horizon so I figured if things were really impossible by the time I was in the immediate vicinity of the field I could always climb out through the fog on the 300° runway heading without encountering the mountain to the east or the very high sand dune separating the airport from the sea. Hayward or Oakland airports would then be available to me where I could wait for better conditions.

My straight in approach took me over the half moon shaped bay that gives the area its name. I noted from indications on the water that the wind was directly on my

tail, but not strong. I confirmed this when I was near enough to see the wind sock. It's degree of sag proclaimed a velocity of between 7 to 10 knots, no problem for the Gee Bee since I had tried that amount of tailwind during the testing period. The low hanging clouds left no room for the downwind leg since the mountains slope up from the airport boundary on one side and the sand dunes do the same on the other. It was like flying into a narrow trough with a lid on top.

"We'll give it a go downwind," I said to myself. "There's just not enough room under here to play around trying to get to the other end of the field. This turkey needs too much space to do a 180°," . . . and so I settled in.

As I learned later, Erna had arrived before me by about five minutes and was standing in the coffee shop looking out of the window towards the runway. She called everybody's attention to the fact that I was coming, clapped her hands with nervous exuberence as I touched down, proclaiming it one of my smoothest landings, turned away for an instant, looked back and screamed.

If Erna thought she was upset, she should have seen the chain of events from my vantage point! Stalling speed is about 85 mph with ground effect. At between 90 to 95 the angle of attack is perfect for a three point touchdown. At that velocity, the rudder is still effective and I can maneuver before contact to position myself in the center of the runway . . . after I have located it coming out behind the wing's trailing edges.

I touched down, and as is my standard procedure, I jabbed hard at the brakes to take over command with positive control before old fiesty could beat me to it. This time he won. There was no pedal pressure at all on either side. I pumped quickly, with no results, which didn't really matter for Model "Z" was already up on the right wheel and darting off the runway. Throttle would have had me airborn just in time to either have clipped the top of a chain link fence or flown into the side of the dune. There was no choice. I slapped the indicator lever on the old Scintilla mag switch to the "OFF" position, threw my arms around my head and ducked below the cowl level.

The right wheel dug into the soft sand. This tripping action flipped us into a low level Lomcevak. The plane rotated in the air, landing on the vertical stabilizer and left wing. The propeller dug into the sand, acting as an anchor bringing everything to a stop right then and there - from about 80 mph when the flip started, to zero - with nothing in between.

The canopy is of the lift-off style and since it was now on the bottom of the airplane and jammed into the ground, it only took me about a tenth of a second to size up the situation. I was pinned in.

"Don't you catch on fire, you . . .", I remember shouting at ol' #4. Obediently, he did not, but I wasn't sure just how long he was going to heed my advice, for I could smell the strong odor of gasoline and I wanted out.

With my right fist I began beating on the aluminum siding of the canopy above ground level. There was no sensation of pain. It was as if I were using a lead hammer. The next day I was aware of it when my hand swelled to about the size of a melon.

The rivets gave way and a tiny hole was available between the framework of the canopy and the longeron. Before trying to wiggle out through an opening that appeared much smaller than my body, I looked up at what once was the bottom of the gas tank. The fuel shut off valve was still in the "ON" position. Habit in leaving the aircraft took over and I turned the pointer to "OFF"! "That was dumb," I mused, "all of the gasoline is down here at the bottom."

I twisted, turned, pulled, pushed, tore my flight suit and skin until I was free. I looked at the opening from which I had just come and couldn't believe my eyes. We can do amazing things when we really have to. There's an old saying in Texas that covers it - "If a rattlesnake bites you in the back of the neck and you are all alone, you'll get your lips around there somehow to suck out the poison!"

Meanwhile, back at the cafe, things were happening fast. Erna somewhat recovered her composure and leaped onto the crash truck as it accelerated toward the wreck. She was banging on the top of the cab with her fist as she stood in the rear of the pick-up urging the driver to greater speeds. They approached from the east which gave them the worst view of the plane with its broken left wing and, since this splintered supporting area allowed the fuselage to rotate about ten degrees, it appeared that the entire cockpit area was crushed.

The rescuers raced to the tail and began a futile attempt to lift it up out of the sand. There were only four of them, including the Islandic 95 pound strong woman who occasionally is even knocked down by a maddened butterfly, so progress was negligible. Model "Z" is not light; over a ton gross!

Others began to arrive and one man came around to the opposite side of the aircraft where I was in the process of wiggling and twisting my way free. It appeared to him that the Gee Bee was giving birth to a bloody child. "Are you all right?", he asked anxiously.

"I've made landings that I've enjoyed more, but I guess I'm alive."

I crawled a few feet in the sand, almost fearful of checking my ability to stand up. My ribs were sore, a couple of areas showed a minor amount of blood, my new flight suite was torn but everything seemed to be in the right place with no evidence of major parts missing.

I rose to my feet. Still O.K., no dizziness. People were gathering along the outside of the fence which I had feared the plane would hit. Nobody said anything - they just clung to the wire and stared.

Voices in an excited pitch were coming from the other side of the plane so I walked around the engine to investigate. It was Erna and her crew of rescuers. Bent over and intent as they were, they did not see that I had extricated myself and was heading toward them.

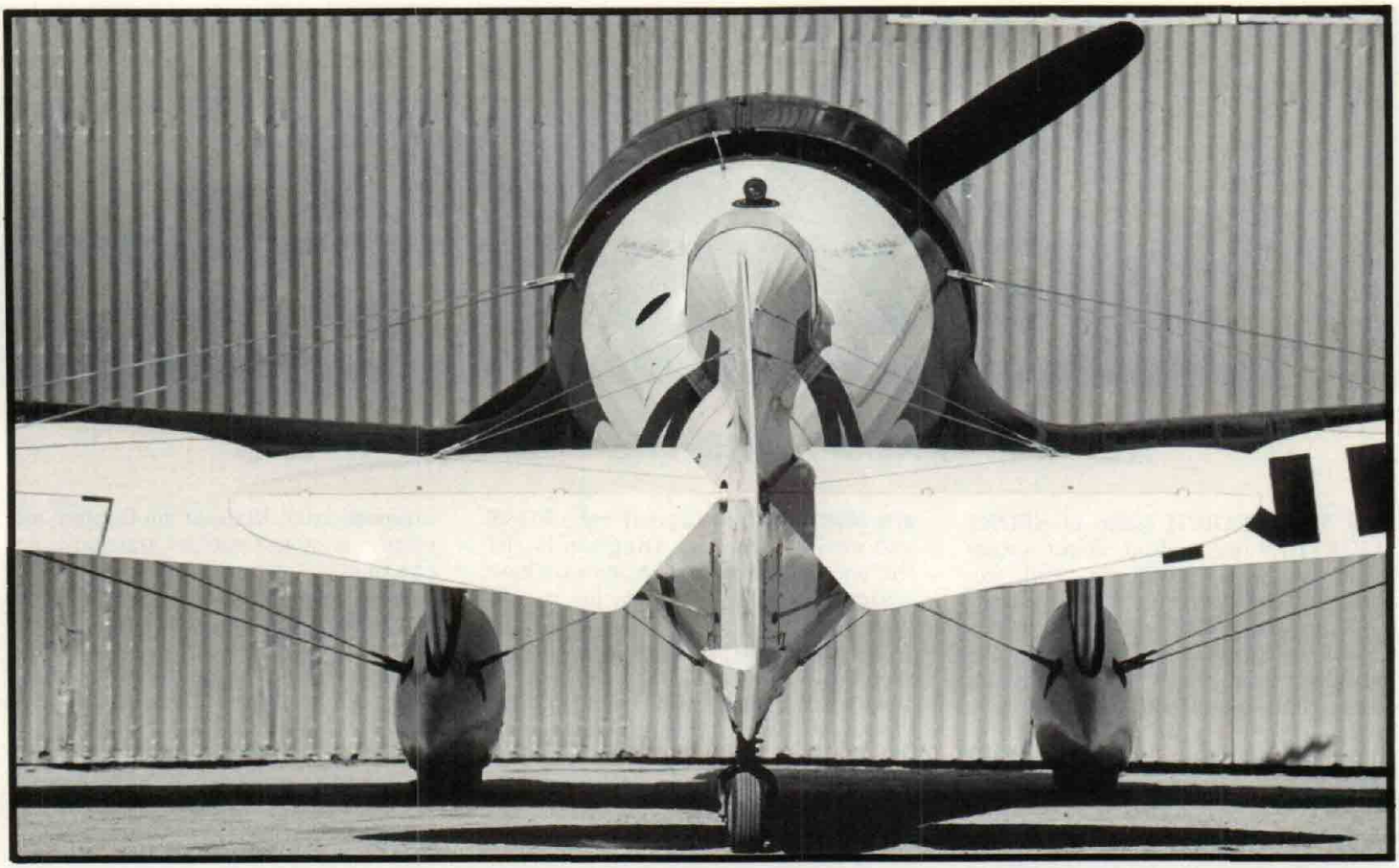
Erna was urging everyone to lift on the tail section while trying to do so herself. I felt the situation needed lightening so I came up from behind, still unnoticed, leaned over her shoulder and asked:

"Do you need any help?"

Erna whirled around, made reference to my canine ancestry, threw her arms around me and we just hung on to each other. Two other people put their arms around me from behind - I don't know who they were - and we all stood there in a close knit group of human concern and thankfulness.

Then the paramedics, the police and the firemen came on the scene. Each organization's representatives satisfied themselves that I was alive if not too happy. I was, in fact, getting less happy with every passing moment. The soothing balm which the body seems to manufacture to cover up the pain from damage the moment it happens began to wear off. Everything started to hurt - I couldn't move and I was having difficulty breathing. The medics recommended going at once to the hospital but I wouldn't leave until the Gee Bee was cared for, too. I patted the rugged little bulldog on his battered body assuring him several times that is wasn't his fault and we would have him in good shape soon.

The weekend tire kickers hanging around the airport that black Sunday were mostly antiquers, homebuilders, warbirds, soarers and others with an empathy for an aircraft such as mine. The care taken in righting the stricken warrior resulted in not so much as another scratch or ding. I wasn't any help - all I could do was watch and express



(Photo by Hiroshi Seo)
If there's a question in your mind why brakes are so essential in the ground handling of the Gee Bee Z, this (gasp!) is the view forward in the 3-point attitude.

my gratitude. Number 4 was towed to Herlihey's hangar on its own twisted landing gear while I limped along behind.

The period of reconstruction for Model "Z" was short - by an odd coincidence, exactly the same length of time it took the Granville Brothers Aircraft Company personnel to build the original plane in 1931 - five weeks. John Herlihey was the hero. He took the project on with a determination to have it ready for Oshkosh. He made it, but my body repair moved at a much slower rate. By the end of July it was still all I could do to climb in and out of the cockpit.

My problem was created by the same situation with which the parachutist is confronted when his canopy fails to open - it's not the fall that does the damage, it's the suddenness of the stop! My shoulder harness and seat belt performed perfectly but, unfortunately, one's organs are not so well held in place by safety equipment. The outside of my body stopped instantly when the propeller dug into the sand, but everything inside kept going at 80 mph ripping loose the vital parts from their moorings. It was weeks before I could even lie down to sleep, let alone tackle the demanding job of flying a Gee Bee two-thirds of the way across the United States.

The magnificent bird suffered the indignity of being transported in a truck to Oshkosh, then on for ten days of nostalgic display at Springfield, MA and, finally, the Cleveland Air Races. It spent some time on loan to Crawford Automotive and Aviation Museum in Cleveland where it sat side by side with Roscoe Turner's Weddell Williams. They made quite a pair. Last December it went to the National Air and Space Museum in Washington, DC where it is scheduled to be the centerpiece of a "Golden Age of Flight" display for three years.

What's on tap for the Gee Bee's future? Immediately after the crash, I had a beautiful letter from Bob Granville's widow, Eva. In it she expressed her thankfulness that I had survived the experience, going on to say how grateful the Granville family was to me for resurrecting the airplane so that future generations could see a Gee Bee. She closed by saying, and I quote, "You have flown it more than all of the original pilots ever flew all of our racers put together! **Never, never, never** fly Number Four again. You have made your point."

Basically, I will heed Mrs. Granville's advice. The design was created as a pylon racer and there are too many variables to the formula when traveling long distances, any one of which can create an unsolvable equation. Model "Z" is, however, too great an airplane to leave on a sour note so it is my plan to fly it occasionally under controlled conditions.

So that's the saga of the "City of Springfield" to date. I would love to find a scapegoat to blame for the whole incident, but I'm the only one guilty. Perhaps the most interesting factor to be of evidence in the whole chain of events is that a Gee Bee was once again involved in holocaust and yet, as was apparently the case in the past, the aircraft integrity was not at fault. It was poor judgment and human error which forced the design into a position from which neither plan nor pilot could extricate themselves. As the current high time Gee Bee pilot of the world, I still maintain that Model "Z" is one of the truly great airplanes ever produced. It's historical significance and impact on aviation rank it high on the roster of outstanding aircraft. It wasn't designed to be a Sunday afternoon sport plane - it was created to be the fastest land plane in the world - and that it was. I salute the Granvilles, their engineers, Bob Hall and Pete Miller, and the era in which was developed some of our most exciting aerial vehicles. May their names and deeds live on in glory as long as man is cognizant of his heritage.