Chapter 18 Briefing

I was employed at Bede for only 28 months, from March, 1972 until July, 1974. That short time was the most important segment for Jim Bede's career. For me, it also was critical, since it taught me about business ethics and it gave me the needed courage to move from being a Government worker to everything I achieved after that.

My story herein is very different than any published history or summary of that failed revolution. You are about to read many detailed stories, some fun, some tragic and many that seem unbelievable. I was a key player when I was first employed by Bede as his Director of Development - in charge of design and flight testing. I write about the stories from my own perspective, in many cases revealing previously-hidden dirty laundry.

Chapter 18 is my insiders' view of what some call the most important general aviation phenomena of the 1970s - a detailed case history of a small, very promising upstart business that fizzled.

This chapter is organized into eleven numbered **Topics**, each with my personal-perspective stories about the Bede era.

If you are an aviation addict who is familiar with the Bede era, especially if you are one of the thousands who lost millions of $ with what was later referred to as a scam, you will likely find these stories compelling.
If you are NOT familiar with Jim Bede, you might enjoy these stories as a peek back 50 years to when flying light aircraft was very different from today.

This chapter's writing reveals many details that have never been published, the things that I was reluctant to reveal until recently. I am compelled to 'tell-all' now, for no other reason than a desire to make the information available for historians.

Also, for me those two short years were critical to my future. My little start-up company Rutan Aircraft Factory may not have been successful if it weren't for the fact that I previously worked for Jim Bede. Lessons learned then meant I could avoid the things that he did wrong - like selling a product before knowing its real cost to produce.

The experience taught me how not to do a company, and gave me the needed courage to be my own boss. Also, see Chapter 17, regarding the same issue.

A detailed Timeline of all the relevant Bede stories from when I met Jim Bede until after I quit and started RAF is included as Topic 10, near the end of this Chapter. In **Topic** 4 of this chapter, I also used a 5-month subset of the Timeline to illustrate one of the stories.

If you are not familiar with Bede's revolutionary program from the 1970s, I recommend you first look at two YouTube videos:

1). Timeless voices of Aviation - Burt Rutan interview done at the 2015 EAA Oshkosh convention.
https://www.youtube.com/watch?v=9VokspEo0AE

2). Pieces of a Dream - Promotional film produced by Bede Aircraft in 1972. https://www.youtube.com/watch?v=9IJwiv5HK4g

End of Chapter 18 Briefing

TOPIC 1). HISTORY OF THE BD-5 PROJECT BEFORE I MET JIM BEDE - 1967 TO DECEMBER, 1971

Jim Bede's aviation career started in 1958. It started with him working for an Aircraft Prime corporation. He later was the first to attempt to achieve the round-the-world-non-refueled Milestone that Voyager achieved in 1986 (chapter 29).

He entered the field of homebuilt airplanes in 1963 which continued until his death in 2014.

He started a revolution with his BD-5 design in 1971 that fizzled in bankruptcy in 1978. That revolution has been written about widely. Books, articles, Wikipedia, blogs and stories about his history are certainly interesting reading to the 100,000+ people that shared his passion, and the ~ 15,000 people who lost money on deposits and on buying his kits and 'production' airplanes that were never completely delivered.

First announcement for the Micro BD-5, from Cleveland, Ohio - early 1971. Note the $1,800 price for a complete kit and note the speed of 215 mph on just 32 horsepower:

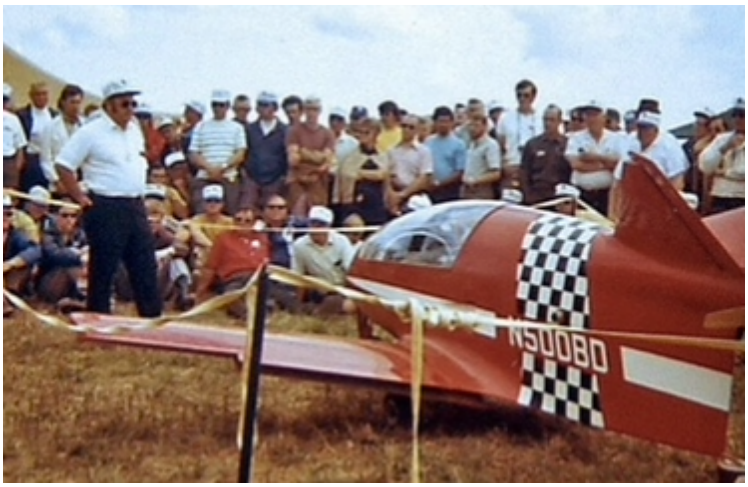
In 1967, Jim Bede and his design illustrator, Paul Griffin, made sketches and preliminary performance estimates of a tiny, single-place, high-performance sport aircraft. Work on the BD-5 project then took a back seat to the BD-4. Bede felt that the knowledge to be gained from the BD-4, a relatively conventional aircraft by Bede standards, was a necessary prerequisite to the tiny, aggressive concept.

The BD-4 proved there was a market for a well-designed homebuilt, and it demonstrated the viability of simple construction methods such as the Bede-patented panel-rib method of wing fabrication and the bolt-together fuselage design. In addition to providing cash flow, the BD-4 program also introduced Bede to the problems of estimating volume and satisfying needs for materials, but it did not prepare the company for anticipating the huge unprecedented demand for the BD-5 when it was offered to the public in 1971.

The first deposit for a Homebuilt kit delivery position was received on February 24, 1971. Four months later, 800 orders with deposits had been taken, even though the first BD-5 prototype had yet to do a taxi test. When I first met Jim Bede in December, 1971, he had received about 2,000 deposits for an undefined kit of materials and the unstable prototype had attempted flight but had only made a brief hop off the runway. In comparison, since the BD-4 program started six years earlier, about 600 kits had been sold.

Five months before at the huge Oshkosh aviation Convention (now called AirVenture) in August, 1971, Jim had shown only a crude, V-tail, fiberglass prototype where all he was able to do at the show was a couple of engine runs while It was roped off and tied down in the grass. It had never been flown - it had only done a brief hop off the runway where it showed directional instability.
I had attended that show for just one day, with my new girlfriend Carolyn, by renting a Piper from Spirit of St. Louis airport, flying to the Oshkosh show and returning that night, on the last day of the convention.

In July, 1971 Jim Bede displayed his first prototype BD-5 at the Huge Oshkosh, Wisconsin EAA Convention. The airplane had not yet flown. However, the crowds there got their first glimpse of the revolution to come - an affordable, fast, easy to build kit airplane that would change aviation in a very big way. It was mesmerizing. Roped off on the grass flight line, the 32 horsepower snowmobile engine was run, and Jim promised to have kits available soon after flight tests were done.



When my wife Carolyn and I were first dating we visited the 1971 Oshkosh Convention on the last of its 8 days. Here Carolyn gets a look at it up on a trailer as it was being tied down for the drive back to Newton, Kansas:

In early 1971 Jim Bede who had previously been doing his aviation business in Cleveland Ohio, found he could buy cheap land at a nice airport in the small town of Newton, Kansas about 25 miles north of Wichita. He would need aviation designers, flight test people and experienced aircraft fabricators. At Newton, unlike Cleveland, he could attract talent to staff the company from the two big general aviation manufacturers in Wichita - Beechcraft, and Cessna. Newton airport had been used for pilot training during WWII.

Jim set up the new company on the Newton airport flight ramp, to develop the revolutionary BD-5 and to market BD-5 homebuilt kits. He bought an existing hangar for the design and testing (Bede Flight Test Center). And, a half mile down the airport ramp to the south, he later built a huge, new facility to produce and market the homebuilt kits. The facility was designed to be able to produce thousands of kits, so people around the world could build this revolutionary, tiny, single place airplane. It was powered by a small, low-cost snowmobile two-stroke engine.

Bede facilities at Newton airport. North is at the top. Hutchison airport is 32 miles west of

Newton.

On September 12, 1971, the BD-5 prototype, N500BD, configured with a V tail and powered by a 36-hp Polaris snowmobile engine, made its first liftoff in ground effect a foot above the Hutchinson, Kansas Airport with Jim Bede at the controls. That outing identified a few problems: the carburetor hiccuped and the nose wheel shimmied.

Also, as soon as it left the ground at its stall speed it yawed uncontrollably. Jim lowered it back to the ground and somehow kept it straight . In his next newsletter he reported that there's nothing wrong with the stability of the airplane - the culprit was the fact that the exhaust from the snowmobile engine was pointed out to the side behind the CG and the

thrust from this exhaust had caused the airplane to yaw. The reported solution was to route the exhaust system so it pointed straight aft, with the benefit of increased cruise performance. In reality the yaw happened because the airplane was unstable and had very poor yaw control from it's too small V - tail. It was October before additional taxi tests were attempted.

The next time the BD-5 went airborne was somewhat unexpected. Delmer Hostetler, shop manager for Bede Aircraft, was piloting some high-speed taxi runs so that Jim could observe the air flow via yarn tufts taped to the aircraft. Accelerating rapidly down the long runway at Hutchinson, Kansas with Bede's chase van in hot pursuit, the BD-5 suddenly hopped into the air, apparently to Hostetler's surprise. He handled the aircraft well, but it was obvious that the V-tailed plane suffered from poor directional stability. Hostetler applied a control input that induced a yawing oscillation. He quickly cut the power and landed in a skewed attitude that damaged the nosegear. Bede trucked the prototype back to Newton to design a more effective V tail.

After running through several new V-tail concepts, Bede decided on a conventional vertical tail with a small, highly swept horizontal tail. His attempts to relocate the tail surfaces also convinced him that its fiberglass fuselage was not suited to the modifications that would be needed as the development program progressed. In order for the horizontal tail to be attached to the fuselage structure, the fiberglass outer shell required time-consuming rework. Furthermore, the cockpit area, which had been fashioned along the lines of the Schleicher AS-W15 sailplane, was too small.

In November and December, 1971 Bede developed a swept horizontal stabilizer and elevator system mounded near the bottom of the aft fuselage and a newly designed vertical tail. High-speed taxi tests revealed that the low horizontal tail produced an undesirable pitch change as the aircraft accelerated to takeoff speed. Tuft studies shows the problem to be caused by the induced flow produced by the propeller. Locating the horizontal tail six inches higher on the fuselage reduced these adverse flow effects.

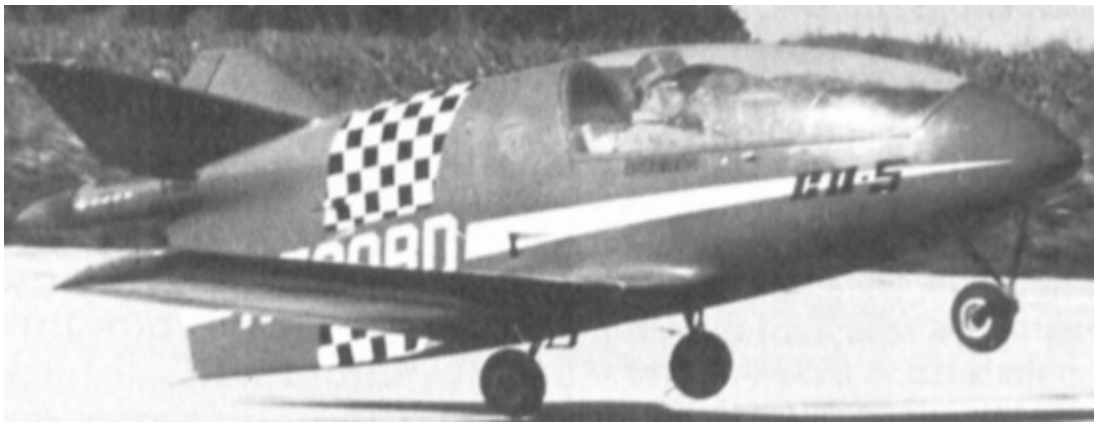
It was becoming clear that a major change was needed for the fuselage structure. The large number of orders for the aircraft warranted a $30,000 investment in the tooling required to produce stretched-formed aluminum skins for a more suitable metal fuselage. By November 1971, the metal parts for the second BD-5 fuselage were being produced.

Bede decided to forego any additional changes or flight testing on the fiberglass N500BD and to devote all his attention to the all-metal, second prototype, N501BD. Also, N501BD was being fitted with the Kiekhaefer engine that Jim had seen at the EAA Convention at Oshkosh in July, 1971 and he was anxious to try this American-made two-cycle powerplant.

All the testing of the fiberglass prototype had been piloted by him or his shop supervisor, Delmer. It was clear to Jim that he needed to hire experienced flight test people. In the late fall of 1971 Bede felt squeezed by the pressures of designing, testing and promoting that were required to make his company grow, so he started looking for a test pilot and additional engineering personnel.

He stumbled into me at Fox field in Lancaster, California airport while he was on a US tour to market the BD-4 kits and the future BD-5 kits.

First configuration of N500BD. V-tail. September 12, 1971.
Just a brief hop off the runway, with Jim Bede as test pilot.



Second config of N500BD.
Conventional vertical tail & tiny, highly-swept horizontal tail.
In October, 1971 two runway hops were flown by Delmer Hostetler.
The landing gear was damaged on the second hop.
I could find no photos or film of the damage.

The homebuilt kits go on sale. Deposits for this configuration were initially accepted in February, 1971, almost a year and a half before any BD-5 flew any real flight. Note the kit cost - only $1960 !

TOPIC 2). BACKGROUND OF MY INVOLVEMENT WITH JIM BEDE

I met Jim Bede in December, 1971 when he brought his BD-4 homebuilt to my local Lancaster, California airport. This was only a month after I returned from planning the F-15 test program at St Louis, where I had married my second wife Carolyn and moved her and her two young girls to Lancaster. At the time, I had expected that my fun USAF job at Edwards Air Force Base might be a permanent career.

Jim Bede was touring the USA to market kits for his BD-4 homebuilt airplane. He was selling a $5 information kit on the exciting BD-5. It seems weird now, but before the internet people would actually pay for what is basically an advertising brochure, especially if it were about something new and exciting. He had already been accepting deposits for those who wanted to commit to build the BD-5.

Immediately after meeting Jim Bede I paid $200 to buy a BD-5B kit, securing an early delivery position so I could be one of the first to receive the kit materials. My intention was not to build a BD-5, but to modify the design to be a stall-proof canard configuration homebuilt. I was fascinated about my invention of a stall-proof airplane configuration and that passion drove me. I wanted to be an owner of two airplanes - a “Mini-Viggen” using most of the materials in the BD-5B kit, and the nearly-complete VariViggen that I had spent 3.5 years to build in my garage.

When I met Jim Bede I showed him photos of my VariViggen project. He asked what I did for a living. I told him I tested military airplanes, I was a civilian stability-and-control engineer working for the U.S. Air Force at Edwards Air Force Base. By coincidence, it was just the time that Jim had decided he needed to hire a professional test pilot for his BD-5

program. His eyes got big… hey, here is a guy that's not only building an unusual home-built airplane, but he is a professional military flight test guy! Jim told me right on the spot that he wanted to hire me!

I didn't know it at the time, but Jim had a big problem back in Kansas. He had hired the National Champion Aerobatic pilot, Gene Soucy to be his chief test pilot. That fact was an impressive claim to note in his various advertising brochures and newsletters. However, he did not trust Gene to keep company secrets, like for example a bad flight test result found during the BD-5 flight test program. However, he reasoned that a professional Military guy is trained to carefully keep secrets to himself. Rutan would be perfect. Jim clearly wanted to release only positive news as he built up his initial marketing program.

Jim's offer to me was specific - I was to be his new chief test pilot at the Bede Flight Test Center in Newton Kansas. I told him I'm not a test pilot, I am a flight test engineer and I also have experience successfully managing flight test programs. I said he could hire me as a Development Director and I would immediately hire the best test pilot in the world for the BD-5 program. I had a new family to support and I would need the same salary I was making at the Air Force which at that time was $18,000 a year.

I got nothing for a month, then I received a Job Offer letter, it specified the salary and agreed to pay my moving expenses. It noted that program schedules required that I arrive in Kansas as soon as possible, since he said the second BD-5 prototype was nearly ready for its first flight and he needed a test pilot and Test Director to do the testing ASAP.

Thinking back now, it puzzles me how I ginned up enough courage to leave my super-fun Air Force Government job to be a Director of Development of a tiny commercial airplane company (the hottest one in the world at the time in terms of unit sales). That move was extremely compelling, since my previous fun hobby of building a new type homebuilt airplane, would now be my day-job with Top-Level Management Responsibility. I quietly reasoned that I would work in Kansas for only a year, then go back to my great job with the Air Force. I knew that if I returned within a year I would keep the seniority and unused sick leave I had built up for 7 years at Edwards Air Force Base.

To accept the job I would have to transport my partially complete VariViggen to Kansas, since it needed a few months more work before it could fly its first flight. I let Jim know that I would need a hangar for my hobby project and that I intended to complete it during off-hours while I was employed at my day job. He accepted. I sold my delivery position for the BD-5 kit I had ordered to a co-worker at Edwards AFB.

So, with that in mind, Carolyn and I (age 27 and 29) and her/our two children, Jetta and Kye (age 7 and 6) packed up a moving van for the move to Newton Kansas, a small town with a big airport north of Wichita. The move was complicated because I had to move not only our household furniture and belongings but I needed to move our almost ready to fly VariViggen. It was to be Carolyn's second big family move in just 3 months time !

I built a wooden framework, turned the fuselage of the VariViggen on its side so it would fit in a moving van with its outboard wings removed. With that in place, we then packed the van with all of our belongings and had them delivered to a house that I had purchased in Valley Center, Kansas just north of Wichita. We arrived in our Dodge Dart station wagon, unpacked the furniture into the house, then drove north and unpacked the VariViggen components into the hanger at Bede's flight test center at newton Kansas. Everything I

owned was now in Kansas.

TOPIC 3). THE BEDE FLIGHT TEST CENTER, WHEN I ARRIVED IN KANSAS

In March, 1972 I started my job as Director of Development at the Bede Flight Test Center in Newton KS. I arrived as a stranger, unknown to the Bede staff. I had previously communicated with only Jim, the President of Bede Aircraft - I had never met anyone else who was an employee of the company.

Here are some photos taken of BD-5 N500BD and wife Carolyn, just after we arrived at my new Kansas job:

Jim Bede was not there when I showed up for work at the Bede Flight Test Center. All of his pre-1971 aviation businesses were in Cleveland, Ohio where he was known as Cuyahoga

Fats (Cleveland is in Cuyahoga county, Ohio). In March, 1972 he was making just occasional trips to Kansas to review BD-5 progress and to be there for critical flight tests. He usually would commute to Kansas and back in his Beechcraft Baron. Jim later bought a home in Wichita Kansas and moved his family there.

I'll never forget the morning that I arrived at the Bede Flight Test Center, for my first day at work. In the entrance lobby I met someone who then introduced me to the two key people: Chief designer Paul Griffin and Shop Supervisor Delmar Hostetler. Paul had several airplane design people, one had previously worked at Cessna in nearby Wichita.

Looking around the Bede Flight Test Center, I saw the reception area, bathrooms, a small office, a large shop with about a dozen of Delmer's fabricators working on N501BD, the second prototype. The first prototype (N500BD), that Carolyn and I had seen 6 months before at the 1971 Oshkosh Convention in Wisconsin, was in a corner, gathering dust. It had flown just three brief hops off the runway.

Near the shop area there were several large drafting tables for the designers. To me, the shop was a 'Candy Store' - small, but well equipped with machine tools, welding equipment and everything needed to build this new, exciting, revolutionary aluminum homebuilt airplane. I knew immediately that this would be even more fun than my Air Force job back in the California desert.

I looked around and there was no office for me. I needed a desk, filing cabinet and shelves to put my flight test manuals, textbooks, slide rule, drawing equipment, etc. Since I was to be doing disciplining, hiring and firing, I needed a private office. However, no one even knew I was supposed to be there.

So I called Jim Bede, who was in Cleveland. I asked him where should I set up my office. His answer, included a couple of pauses, and then he said oh, just take over my office right next to the receptionist. That office was a small private room with a desk, filing cabinet and huge chalk board with lots of scribbled notes. I could make out some of the notes, most were reminders to do things and others were design sketches, typical designer's notepad stuff, but no real calculations or equations.

Jim never did replace his office at the Flight Test Center. He was staffing up a huge new facility a half mile south down the flight-line - the building that would be for marketing and assembling the thousands of kits for the homebuilders. It had several large roll-up doors so trucks could unload materials and load the big boxes of customer's BD-5 kits. At this facility he setup his nice office. Right next to his new office would be his extensive library of NACA technical reports, moved from Cleveland. Nearby there were offices for Purchasing Manager, CFO, HR and a couple of secretaries.

Up at the Flight Test Center several people were curiously watching me as I moved my briefcase and three large cardboard boxes of engineering stuff into the office of Jim Bede, the president of the company. When I let them know that I was their new boss, with the title of Director of development, they looked startled and confused. Jim Bede had failed to grease the skids for me. No one there knew that he had hired an outsider who would be the boss of all Research, Development and Flight Test !

The next morning I decided to impress my employees about my knowledge of flight test engineering, and my skills as a designer. I did two things: First I asked the shop to fabricate

a box to be mounted in the forward nose of the airplane and a similar box to be mounted as far aft as possible and told them that in order to change the center of gravity for forward or aft CG flight testing, we would be putting lead bars or lead shot into one of the two boxes so we could test at different CG positions. I later found that the aft box was ludicrous, when we weighed the airplane and found it to be grossly tail-heavy.

The second thing that I did was to design a flight test nose boom, the tube that extends forward from the nose of the airplane out of the way of the local pressures on the fuselage such that we could accurately measure the pitot and static pressure, two pressures that were needed in order to know accurately airplane's speed and altitude Any calculations to be made on performance would be invalid, unless we could accurately know the altitude and the dynamic air speed.

Paul Griffin and the shop guys were puzzled as to why we needed to do that and said that Jim would not like the looks of an ugly tube sticking out in front of his otherwise perfect, beautiful airplane. Also, someone could trip over it when it's parked. I then designed it so that it threaded into an interior nut and the boom had O-rings for the pressure connections so that without tools, you could remove it by twisting it with your hands while pulling it forward.

As it turned out, Jim Bede loved the appearance of this flight test nose boom since he had seen photos of high performance military airplanes being tested, and all had these "beautiful" booms out in front. All future BD-5s have that nose boom. Ah, my first win.

I was unable to find a typical Organization Chart in Newton, so I structured my own, initially for 'my eyes only', based on my Job Offering agreement with Jim. I kept it hidden, thinking it might cause confusion or chaos, but knowing it might be handy sometime in the future.

While my ego was stroked knowing I was the new boss of the entire Bede development/test sector, as a new outsider I felt I was walking carefully on broken egg shells among some of Jim's best old friends:
Paul, who 5 years earlier had made the original sketch of what later became the BD-5 had worked with Jim on several other design concepts before. While he had done the design drawings of the BD-4, he did not have a college engineering degree.

Delmer was another longtime friend of Jim Bede. He was a farmer from Harper, Kansas. I do not know how he met Jim. His skills as a shop supervisor were excellent. He was everyone's close friend and the shop folk usually all ate lunch together. He did not have an office, he worked hard as a skilled fabricator right alongside his employees. I quickly found that everyone at the Flight Test center, except the receptionist, worked very long hours. It was not unusual to see shop guys there, finishing up a task at midnight. I reasoned correctly that the work building this revolutionary prototype research aircraft was a lot more fun than anything else in Newton Kansas.

I learned that Gene Soucy, the current National Aerobatic Champion, who was introduced in a Bede advertising brochure as the Chief Test pilot for the BD-5, was not the REAL chief test pilot, or even ONE OF the BD-5 test pilots. Jim wouldn't let Gene go to the first flight because he had a lot of friends in the aerobatic world and Jim was worried that if something bad was wrong with the BD-5, Gene would tell all of his friends and the negative information would get out. The fact that his 'Chief Test Pilot' didn't fly the airplanes' first flight or even was not allowed to witness it, gave me a snapshot of the Bede organization

when I arrived.

My first challenge was to make good on the promise I had made to Jim - to hire the best test pilot for the job. I called my friend at Edwards Air Force Base, Les Berven. I described the Candy Store, the fun people were having and the fact that Jim had a lot more airplanes than people to fly them. Les was not only the best 'stick and rudder' pilot I knew, he had with a mischievous sense of humor and a voracious intellect. To my delight, Les accepted and planned a quick move, to be in Newton before N501BD was ready for flight testing. I had completed my promise to Jim Bede - our team would include the most skilled Chief Test Pilot there was.
https://archive.seattletimes.com/archive/?date=20011223&slug=berven230

To give you an idea of Les Berven's passion for aviation, here is his most famous quote - a saying I enjoyed so much that I spread it around for decades, with credit to Les. **"The purpose of man'e existence on earth is to fly, time not spent flying or preparing to fly is wasted".**

In 1966, Les and I had been in the Edwards flying club and, as EAFB employees, were able to rent Cessnas and a T-34 trainer at low rental rates. We had done our our own flight tests of the club airplanes, to hone our skills needed at our day-Job as Flight Test Engineers.

Les and his wife Carol had been with me in 1971 when I was at St Louis to do the planning for the F-15 USAF flight tests. He had been my Best Man at my wedding to Carolyn, and he flew us to Lake of the Ozarks for our brief honeymoon on September 17th, 1971.

I had joined the Bede organization with a bunch of people that were friends to each other, but not one of them had previously known me. Now, with Les on board, I was working with my long-time best friend. Having the two key positions of the design and flight test organization, we were together tackling the demanding job of making Jim's BD-5 fly correctly and safely. Having the clearly talented Les Berven on board solidified that the new guys were in charge and our hard work and dedication would assure success.

A photo taken just after Les Berven arrived. Note that the "new-guys" are wearing neckties, an unusual attire for Newton Kansas. I don't recall who the guy on the left is:

In the spring of 1972 Les and I we were having so much fun it was difficult to hide our boyish smiles. Our 30th birthdays were still in the future.

Occupying Jim Bede's office and knowing it might be private, I still could not resist looking through the contents of Jim's desk and filing cabinet. I quickly found the assumptions that Jim had made when he had calculated the BD-5 performance for his sales brochures. I was shocked.

For parasite drag, the primary factor in calculating an airplane's maximum speed, he had assumed that the entire airplane would have laminar airflow, well back from the maximum cross-sections. Laminar flow is what enables the super performance of expensive Competition Sailplanes. They have to have perfect smoothness on their wing surfaces, because even the slightest imperfection (a tiny wiggle, gap, step or even an insect smashed on the leading edge) will double the drag when the air flow becomes turbulent. A laminar wing has half the drag as a turbulent wing. A competition sailplane owner spends many hours sanding, shaping and polishing the wings.

A typical light airplane has no laminar flow on the fuselage, and only small amounts of it on the wings. Anyplace where there is a rivet or the slightest imperfection of an otherwise perfect shape, laminar flow is lost. A wing skin that bulges between the ribs to provide the lift needed to fly, destroys the potential for laminar flow.

Jim had not considered the drag to cool the engine, or the drag of intersecting components like canopy frame, gear doors, etc. He also assumed that the propeller efficiency would be 90%, well above a typical propeller and likely impossible for a propeller that has flow disruption by being behind fuselages, wings and tails.

Finding this was a "suspicions-confirmed" moment for me. I now knew why an early brochure showed 240 mph cruise speed using the small snowmobile engine.

My fear was confronting Jim with this. I did a quick calculation that did include a realistic list of drag items, and I got a parasite drag value of about twice what I was seeing in the drawers of Jim's desk. It showed cruise speeds closer to 160 mph. I decided to hide my calculation, it did not seem like a good Idea to have a confrontation this early in my new Job. Jim would find out the real performance when we accurately measured it during our flight tests, then a debate would not be needed.

I was later to find that Jim wanted the initial taxi tests of the second prototype to be at the nearby Hutchison airport, away from the eyes of BD-5 kit purchasers who daily roamed the Newton airport hoping to get a glimpse of a BD-5 through an opened hangar door, or maybe even witness a test flight. Keep in mind that this was 25 years before the Internet or phone cameras, so it was easy to keep things hidden.

After the disappointments during taxi tests of the unstable first prototype six months before, Jim wanted the public, journalists and customers to see flight testing of the second prototype, N501BD, only after it was flying well. So, in June we would be trucking N501BD to Hutchison, 30 miles west of our Flight Test Center, in spite of having an excellent runway just outside our front door. Jim needed the initial tests to be done in secrecy.

Late that first week I was approached by Cecil, who worked at the big manufacturing facility. His job description was human resources. He was the one that determined how many hours people had worked so he could send, by telephone, the data that were needed so that Jim could pay the employees. The paychecks were written at Jim's facility in Cleveland Ohio. Every two weeks they were mailed to Newton, then handed out to employees.

Cecil approached me, asking what is my salary, so he could prepare the data so I could be paid. I told him that I had an agreement with Jim to be paid the same amount that the Air Force had been paying me at Edwards Air Force Base, $18,000 per year. When I told him that, he looks startled saying that can't be true, no one here at the company makes that much money. I reached into my briefcase and produced the signed offer of employment from Jim Bede stating clearly that I would be paid $18,000 per year. He walked out, looking confused. A week later I was pleasantly surprised to find I had been paid correctly.

An Air Progress magazine Ad, showing June Myzk (21-year old Receptionist I had just hired).

TOPIC 4). BURT IS GIVEN DESIGN RESPONSIBILITY FOR THE JET

While my Job title at Bede Aircraft was Director of Development, there were only two airplanes that I can claim Design Responsibility. One is the Jet BD-5J and another is what Bede called the Trainer, or BD-5T.

The BD-5J Jet, an Exciting Revolution, or a Plan for Company Survival?

No question Jim Bede was the eternal optimist, willing to bet on any long shot to succeed. In April, 1973, a year after I arrived in Kansas, the future of Bede was already looking bleak. Looking at the data, the company had little chance of surviving since the huge backlog of sales for the 5B and 5A kits had a contracted guaranteed customer price that was less than the price Bede would have to pay to buy the bulk materials , hardware and systems.

I guess that Jim had a solution - The company might be saved by offering a new product, based mostly on the current kits. He could do this by selling the new kits for about **20**

times the price of the current kits. The new kits would be sold only to rich people. They would be homebuilt kits for an exciting JET, an airplane that would have none of the problems of the junk snowmobile engines. Since the propulsion, including the jet engine would cost at least $35,000, the rest of the kit could be priced for a huge profit, hoping to attract hundreds of affluent aviation enthusiasts. Then, that business plan might recover the losses from all those early, under-priced kit sales.

In April, 1973 we started developing a Jet BD-5. None of us realized that the jet was not just a “fun project”, but Jim’s plan for the company’s survival.

For me, the jet program was a huge technical ego boost. Unlike my other job duties on the prop versions where my design ideas were debated with Jim’s folk and most were rejected. The engineers at the Flight Test Center had seen me and Les Berven as the flight test experts, but took direction from Chief designer Paul Griffin who, together with Jim made the call on all design decisions.

The jet program was handled different. Jim respected my experience with Air Force jet fighters, as well as my design work on the VariViggen. That is why every design modification to the Prop airplanes to make them into a Jet was my sole responsibility. I saw it as a ‘win-win’ for everyone - the propeller 5A and 5B design guys would no longer be pestered by me, and I could enjoy full design freedom and responsibility for the new 5J Jet.

At 29 years old, I was now designing an airplane that would be sold to the public. Wow - That scenario is why I claim to be the designer of just two airplanes in Kansas, the BD-5J and the BD-5T trainer, where I had similar design responsibility.

Thus,10 months after arriving in Kansas, my talents as a designer were focused on only three projects: the Bede jet, the Bede trainer and my personal Variviggen.

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The First Bede Jet Aerobatic Airshow Team

Jim Bede did not form the BD-5J jet aerobatic teams, however they were an important part of marketing after the spring of 1974. So, he helped them in several ways, notably letting them use his DC-3 to fly the jets to airshows.

BD-5J in the Bede DC-3 cabin.
Airshow pilots Corkey Fornof, Tom Poberezny and Gene Soucy.

The Military uses public airshows to attract talent and boost enlistment. Most notable are the Air Force Thunderbirds and the Navy Blue Angels, who perform at the largest airshows. Civilian aerobatic teams provided airshow excitement at hundreds of small airshows each year, generally using the Curtis Pitts biplanes.

The Jet BD-5J added a new dimension to excite the airshow crowds. The first team was formed before I left Kansas. Bob Bishop, noted for his airshow performances in a Bellanca Viking aircraft, bought 20 BD-5 kits in 1973 and hired Ames Industrial (the company that supplied the TRS-18 Jet engine for the BD-5J prototype) to build several of them, similar to our BD-5J prototype, but optimized for airshow performances.

Ed Mahler, Corkey Fornof and Bob Bishop.
Just prior to their first three-jet Airshow, May, 1974.

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TOPIC 5). BURT'S SECOND KANSAS DESIGN, THE BD-5 TRAINER

In late 1973 we faced a dangerous scenario ahead, where it was not practical to have a two-place trainer version of the BD-5 and a worse danger - that a large % of those who bought kits were not even licensed pilots. Without realistic training, the accident rate might be horrible.

Jim saw that he needed a realistic simulator to qualify people before they attempted to fly their homebuilt BD-5. He handed me a sketch which showed a huge cage with a BD-5 suspended by springs inside saying it could be towed by a truck and a pilot could thus get trained. He told me that I would be the designer/developer of the training system and he wanted to have it operational in….two weeks.

I took his sketch and returned to my office with a smile. I always enjoyed the challenge to invent something new. I also looked forward to further escape the on-going challenge to find a reliable engine for the homebuilt BD-5 kits.

My BD-5T Configuration:

I knew that to provide realistic training, the airplane would have to be in front of the truck,

where the incoming air was not disturbed and where the pilot could not see the truck. To provide safety for the pilot-in-training and people that might get hit by the truck, it would be best to have a lower speed than the basic BD-5. Also, it was clear that to have the aerodynamic motions correct the airplane must be mounted at its center-of-gravity. The mounting structure from airplane to truck was free to move up or down, so it is only aerodynamic lift that causes the airplane to climb or descend. It is also free to move sideways, so one of the truck driver's tasks was an easy one - just steer so the airplane stays directly in front. If the pilot screws up and heads off the runway, the driver hits the brakes to stop before those little wheels hit grass or mud. The up motion of the mounting structure had a bumper and stop, to limit the airplane's altitude.

Also, the airplane is not restricted in any axis. It is free to rotate in pitch, yaw and roll. Thus, all attitudes are those that a free airplane achieves due only to pilot control inputs and aerodynamic stability.

The trainer did not need a runway. Any relatively smooth road would do. We generally operated it on the taxiway right in front of the Test Center building. The joke was that if out on a road, the pilot must fly under, not over an overpass.

On one modification, we hooked up the truck's throttle to the throttle lever in the airplane, but quickly found a big safety problem: on sensory overload from flying (particularly in a crosswind) the pilot would forget to reduce power once airborne resulting in the truck locking up its brakes while trying to accelerate. The solution was to just let the truck driver accelerate to over the stall speed allowing the pilot to lift off when his airspeed indicator showed it safe to do so. For landing, the pilot would tell the truck driver when he wants to land and the driver would give him the declaration matching the normal speed changes when the airplane has reduced power. The pilot would know when to descend and would flare and touchdown just above his stall speed (or stall attitude) just like the task he has when landing any airplane.

If the airplane had to lift itself plus the mounting structure, the stall speed would be too high. My solution turned out to be the best feature of the trainer. I mounted a row of garage-door tension springs at the back of the truck rigged to lift up the airplane. The springs were strong enough to nearly lift the airplane off the runway with no pilot onboard. Thus the stall speed was greatly lowered since the wings had to lift just a little more weight than the pilot's weight.

When the airplane was near the maximum altitude stop, the springs were then slacked so their tension was low. This made the stall speed higher when the airplane was higher. Because of that, the truck driver had to drive faster when the airplane was flying high.

Thus, if a pilot stalled when flying high, his descent would be cushioned as the airplane dropped. This proved to be a perfect solution to avoid hard loads on the landing gear due to a stall done too high.

The trainer was very good at identifying which pilots would have problems if they flew a BD-5 and judging his technique and skill for crosswind landings.

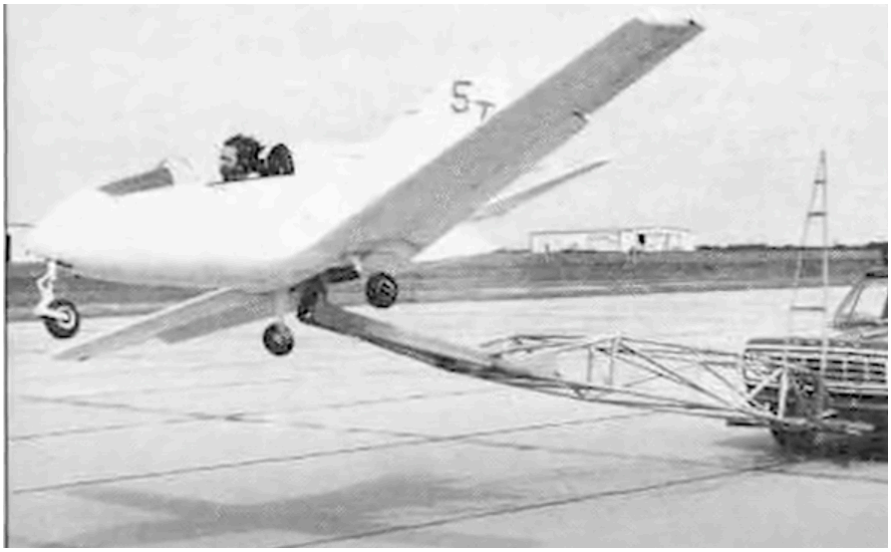
Two trainers were built in 1974 with first flights on February 14th and June 15th. I flew both first flights. The June, 1974 flight was the last time I flew any Bede-type airplane. I never had the opportunity (or desire) after that to expose myself to the various quirks of any of

them.

Oh, in-house at the Bede Flight Test Center we never called it a trainer, it was always **“Truck-a-Plane”**.

The first Bede Trainer.
Note the row of tension springs up high at the back of the truck.

Journalist Dave Noland flying the trainer.
Its wing is down to counter the drift in a strong crosswind.



The BD-5T is a far better simulator for training than any of those million-dollar ‘Moving Base Simulators’. It gives full, realistic response to the real dynamic atmosphere and runway as well as a real, not simulated view for the pilot. Thus, I rank it as one of my best aircraft designs, even though some will argue it is not really a ‘flying manned airplane’.

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TOPIC 6). FUN STORIES DURING MY BEDE EMPLOYMENT - MARCH 1972 TO JULY, 1974

The "Two-Week Schedule"

Arriving at my new job in March 1972, I asked around to find out what the schedule was for the first flight of the new aluminum N501BD airplane. Several employees told me that Jim wanted it flown within 2 weeks. Jim had previously concluded that his team, if driven hard, could do almost anything in two weeks. No one told me it it was impossible. My initial thoughts were if that were done, the airplane was going to be flown even if it had many safety-related faults.

I decided to initially be mute. Then, when I started adding tasks, like the noseboom, ballast boxes and a fix for the non-functional flaps, it seemed that the team wanted to reject everything. We just did not have the time for any new tasks if we were to meet Jim's 2-week demand.

One guy walked into my office (actually Jim's office) and closed the door behind him. He whispered that everyone knows that Jim always asks for 2 weeks for something that clearly should take 8 weeks. That way, he can occasionally get a 8-week job done in 7 weeks… clever! I whispered back "thanks for the intel".
I then asked him if he knew that the performance figures on the advertisements were not obtainable. He said "yes, but it really does not matter since our customers are so excited about having a BD-5, they would be satisfied if it could only go 170 mph". From that time on I knew I had a true friend, someone I could trust to be totally candid with me. A very useful thing for a new Boss, who recently had been a total stranger to everyone.

I thought about what he had said, then turned around, picked up a piece of chalk and wrote the following sentence on Jim's chalkboard behind his desk: **"The Difficult we do in two weeks; the impossible we advertise"**. Surprisingly, that chalk quote remained on the big chalkboard the whole time I worked in the office. People would usually just smile to note its humor.

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Jim Bede Did Have a Long-term Marketing Plan

What was Jim really thinking in the early 1970s? Few of us believed it, but Jim had a vision to dramatically reduce the cost of flying.

At the time that Bede sold his first BD-5 kits, the total production rate of all U. S. General

Aviation airplanes (small, propeller-driven) was only 7,500 per year. There were 12 manufactures and the average cost of each airplane was about $12,000. Airplane ownership was expensive. Costs included pilot training, hangar rent, required FAA airplane annual inspection, routine maintenance, insurance, etc.

By offering a phenomenal dream - something the masses could afford, keep at home in their garage and could fly anywhere, Jim assumed the market with this new home built kit revolution would be hundreds of thousands of airplanes per year, and thus the economies of massive production rate would kick in, dramatically lowering the kit production cost.

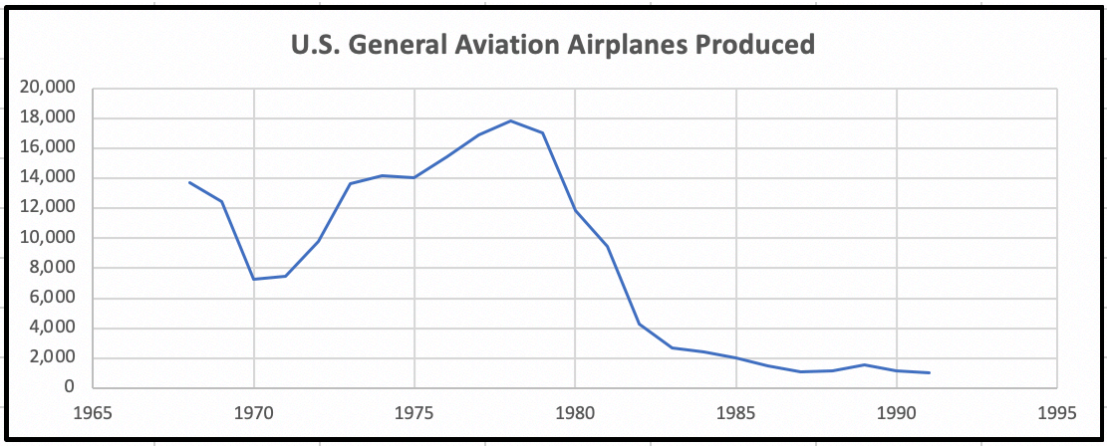
Jim had the courage to start his BD-5 kit business based on his extreme dream of 100,000-units/year. Even if the BD-5 engine problems had been solved, the plan was impossible to achieve because airplanes are just too dangerous to fly for a population of neophyte or non-pilots, especially in bad weather.

From 1973 to 1980 production of light aircraft peaked as high as 17,000 units per year, then dramatically declined, mainly due to needed tort reform. The big-3 - Beechcraft Cessna and Piper each had 30,000 to 50,000 airplanes flying. Costs for defending suits following accidents skyrocketed. Those costs dramatically increased the price of new airplanes, which resulted in declined units sold. Total U.S. production dropped to lower than 1,100 units per year in the 80s and 90s.

To save the small airplane manufactures from bankruptcy, in 1994 Congress passed legislation, the General Aviation Revitalization Act. This limited their liability for accidents of old airplanes, thus protecting the companies from going bankrupt. Afterwards, some recovery was experienced - Beechcraft, Cessna and Piper dodged bankruptcy but production rates of GA airplanes remained less than 3,000 per year. The companies had survived mainly by producing expensive Business Jets at a cost of 3 to 5 million dollars each.

https://en.wikipedia.org/wiki/General_Aviation_Revitalization_Act

Note in particular the “Units shipped” data on this chart. The reason to be optimistic in 1973 and the sharp, continued decline after 1978, as Bede was going bankrupt. Bottom line - the size of the Bede BD-5 revolution enjoyed the best times for general aviation (units delivered as high as 17,000 per year), but the small-plane market was later hindered by the huge decline in light plane sales to only 1,000 airplanes per year by 1985.



Many historians concluded that the industry had over-produced light aircraft in the glory days from 1973 through 1980, because the public wrongly thought that they could safely fly them without significant training, mainly for bad weather IFR conditions. This conclusion is probably correct, and would remain so for more than 40 years when self-flying light aircraft would be technically possible. Self-flying light aircraft are a significantly easier software challenge than self-driving cars, and might become a reality by 2025. If this occurs, I believe that light aircraft production could increase beyond 50,000 units per year.

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Test Programs for N501BD and N502BD, the Second and Third Propeller BD-5

N501BD was the second BD-5 built. Like all those built later it had an all-aluminum structure. It was initially a BD-5B with the long wings. Later we would briefly test it with the short wings (the BD-5A model). It was still under construction when I arrived at the Newton, Kansas Flight Test Center to start my first Job after quitting my 7-year job as a flight test Project Engineer at Edwards Air Force Base.

Jim Bede wanted N501BD to fly within two weeks, in order to keep a promise he had made to homebuilt kit customers. The company had started selling kits to the public more than a year earlier, and was still not able to show customers a photo of a BD-5 flying. Jim had also told the public that the first BD-5 (the fiberglass N500BD) had flown a year earlier. However, all it had done was three hops to just a foot above the runway where it was shown to be unstable and was damaged on the third one. Those brief hops had been done at Hutchison airport, out of view from the public. The public (spies who had bought kits) naturally assumed that all Bede flight tests would be flown at Newton's 7,000 ft concrete runway, right in front of the Flight Test Center.

Unfamiliar with those earlier covert trips to Hutchison airport (32 miles due west of Newton airport) I had assumed that all our Bede Flight Tests would be done at Newton. I did notice the occasional stranger parking his car, walking the ramp and trying to look in the windows of our Flight Test Center.

I had arrived at Newton in early March, 1972. On the 18th I got checked out in Bede's

BD-4, an airplane we would use to chase N501BD flight tests. In mid May I checked out in another chase plane, Bede's AA-1 Yankee. I calibrated its static pressure system using the tower-flyby method so we could later get accurate altitude and airspeed data via the chase method on all our flight test airplanes.

My new friends (my employees at the Test Center) had never heard of the tower-flyby calibration method and I suspected they did not understand it after I explained it. https://vimeo.com/33041130 https://www.nasa.gov/centers/dryden/news/DTRS/1995/HTML/TM-104316/index.html#:~:text=The%20tower-flyby%20and%20radar-tracking%20methods%2C%20also%20described%20in,in%20opposite%20directions%2C%20wind%20errors%20can%20be%20minimized.

I was really feeling great - now I could apply all the flight test methods I learned the previous seven years at Edwards, to my own test organization on an exciting homebuilt airplane. Also, my good friend from Edwards, Les Berven accepted my job offer as Chief Test Pilot and arrived at Newton in May. During 1971, Les and I were the only people in the Bede organization who had extensive experience in aircraft flight testing.

To my surprise, the Kit Manufacturing Facility, a huge building a half-mile south down the ramp was already building a production line and packing cardboard boxes with some of the materials the homebuilder would receive.

It was apparent to me on the first day that there was no way that N501BD would fly in two weeks. It would need extensive work to make it safe to fly. I did not initially report this bad news to Jim since one of my employees told me that Jim was indeed familiar with the schedule status. The most important item to Jim was that N501BD could be flown in front of hundreds of thousands of people at the Oshkosh convention in early August….just 5 months away.

That first week I remained at work after closing time. I wanted to go over the prototype and its support equipment alone in detail, to see what would need to be done before my friend Les Berven took it up for its first flight.

I operated the wing flaps, which had a split-flap configuration that needed several small pushrods to extend them along the wing's span. I noted that the pilot's flap handle would see no loads when the flaps were fully up and when they were fully down - good over-center kinematics in the actuation design. However, I also noted that the flaps moved quickly while the handle moved slowly at the half-flap position.

The next morning I asked the flap designer to demonstrate flap operation. He smoothly moved the pilot's flap handle up, then down, then up, clearly smiling as he did. I then placed my finger on the trailing edge of a flap and asked him to extend them. The smile disappeared as he now realized that a small aerodynamic up-load, typical for a split flap configuration, would preclude any ability to extend the flaps in flight for landing. Also, of course it was apparent that it would be impossible to set a half-flap position in flight since the handle loads would be huge. The only way to do a full-flap landing would be to extend them fully before takeoff and continuously leave them down for landing. In short, the kinematics were unacceptable.

That, and a couple of other design flaws I noted to the team gave me a real dilemma: I really wanted to have a good working rapport with my team, but it was clear to them that any insistence I noted for perfection would further increase the schedule pressure they were under. My reaction was to not mention any fault unless it was a definite flight-safety item. After all, their new Chief Test Pilot, Les Berven would be joining the team soon and it would be difficult for them to personally suggest putting his life at risk.

Flight testing involves testing the prototype at all its limits: speed, weight, cg location, altitude, crosswind landing, etc. I did have a light person - June Myzk at 95 lb and a heavy one - AL Thompson at 250 lb, which could easily change the cg location, but neither one was a test pilot. I asked my team how they planned to vary the cg location to find its forward limit (controllability) and aft limit (stability). I got blank stares so I set about to design two simple boxes, one in the aft fuselage and one in the nose which could be loaded with sacks of lead shot, a typical way to load a light homebuilt aircraft.

Of course if the basic airplane did not have the correct cg to balance it, one of the boxes would not be needed. Asking around to find out how heavy and how balanced N501BD was, got a shrugged-shoulder response. I was told that one of the reasons for switching from fiberglass structure to aluminum was to get a lighter structural weight, but no body seemed to know where those calculations were located.

I found several different numbers for the Design Gross Weight and apparently, in the rush to stay on schedule, the airplane had not been weighed.

It would take at least 4 to 6 hours to prepare it for a weighing, another schedule hit. So, I got the needed people together to find all missing parts (landing gear, canopy, engine, prop and its drive system, instruments, etc.) so we could assemble and weigh it on a Sunday so as to not delay things. We also decided to wait for the arrival of Les Berven, so we could weight with the actual pilot and parachute onboard.

Unable to find the Design CG documentation, I assumed it would be between 12% and 38% of the wing's Mean Geometric Chord. Flight testing would later define the real limits for the Flight Handbook. I wanted to do the first flight at 25% of MGC. Likely the final acceptable range would be + or - 3 inches from that ~mid cg location.

Weighing results:

I was shocked to see that the airplane weighed more than 100 lb over the design estimates. Worse yet, the cg was a FULL 10 INCHES aft of where it should be. The airplane would not sit on its nose gear, even with the pilot onboard !

How was it possible to be this far off? Well, for one there was a concern that if it could really cruise at 250 mph, it would quickly reach 320 in a shallow dive. That is an area where destructive flutter might be likely - so everyone who designed the parts was using thicker aluminum than it needed, thinking this would reduce the risk of flutter. The tail and aft fuselage was built with sheet gauges twice as thick as was really necessary. Also, all solutions for the various failures in the prop drive system had been exclusively to make everything heavier, rather than dealing properly with the cause - torsional resonance. The Variable-Speed belt drive system was a clever way to change the gearing ratio to optimize climb rate, but the VSD component was extremely heavy.

The bottom line was that we had a totally unacceptable airplane that would need extensive reductions in weight, to get anywhere near its takeoff and climb expectations.

Of course the cg had to be in the right location for a safe first flight. To ballast it forward we hung the fuselage nose down and poured molten lead into it, filling the first foot of the fuselage just forward of the rudder pedals. Weighing it, we again found it was tail-heavy so we welded some sheet steel into the shape of a cone, then poured it full of lead, thus adding another ~ 30 pounds forward of the nose. So when you see this cone on front, you know it's N501BD, since all subsequent BD-5 aircraft are designed to balance properly.

BUT, IT HAD TO FLY AT OSHKOSH in August, only a couple of months later.

The team set off doing two separate paths of work:

1). Get our "pig" - (N501BD) flying so we could get some needed credibility with the hundreds of customers who had already ordered kits. And to get on with the important stability and control measurements.

2). Redesign ship #3, (N502BD) so its weight and cg would be acceptable. Order new stretch-formed aluminum fuselage skins with the correct thickness. Consider moving the wing (with its attached main landing gear) aft on the fuselage.

Taxi and Flight Tests of N501BD, the first aluminum BD-5:

The airplane initially had a highly swept, very small horizontal tail - something that looked too small, because the BD-5 design team (Jim Bede and Paul Griffin) were still doing their best to maximize speed for the tiny airplane. Its Kiekhaefer engine had been replaced by a low-cost, two-cylinder Hirth snowmobile engine.

On the last day of May, 1972 we trucked N501BD (by that time affectionately known as Five-Oh-Wonderful) 32 miles west to the Hutchison Airport for its first taxi tests. It was just a week after I had flown the first flight of the VariViggen, and just nine weeks before the Oshkosh Convention.

The small town of Hutchison is now known for its excellent space museum, the

Cosmosphere. However, in 1972 there wasn't much going on at its airport, a good place to hide our the testing from the public. Jim had taken the fiberglass prototype (N500BD) there eight months earlier for its original taxi tests.

The taxi testing did not go well. With any power being applied, it was not possible to raise the nosegear off the runway to an attitude needed for takeoff. It rotated and briefly lifted off only by increasing the speed to takeoff speed and then reducing the power to idle.

A week later we were back at Hutchison with a new horizontal tail. However, this tail was unstable about its pivot, such that a liftoff attempt would be very dangerous.

There were more Hutchison taxi tests nine days later with a re-positioned tail pivot. Again the tail was not suitable for flight.

Three weeks later, on July 8th was taxi and runway liftoffs with yet another, larger horizontal tail. This larger tail solved the problem and its large size would reduce the cruise speed by only 3 mph. Les proclaimed that the airplane flies fine and that the 'Hiding at Hutchison' operations were not needed. Now, Jim Bede wanted the world to see how great our tiny airplane flies.

Three days later, after some modifications to the engine and fuel system, Five-Oh-Wonderful finally made its first flight away from the runway environment. Flying qualities were good, but the flight was cut short when the engine over-heated, smoke entered the cockpit causing Les to shut the engine down and glided to a nice power-off landing on Newton's runway.

Chief designer Paul Griffin and I were in the chase Beechcraft Baron with Jim for the next flight. Our primary purpose was to get photos of the test airplane so we could finally prove to the world that it flies fine. The slower chase planes were better for taking photos but Jim feared that the BD-5 was too fast.

As Les joined up close to us everyone was thrilled but Jim. Jim had instantly noticed that the flexible tube spar caused the wing's top skin to wrinkle in the first two rib bays. Many metal aircraft have wrinkled top skin when maneuvering, but we had wrinkled skin in level flight. The otherwise smooth airfoil loses it laminar flow and doubles the wing's aerodynamic drag. Jim's dream of 250 mph with 40 horsepower evaporated that instant. He had spent 2 years dreaming about this special performance calculated capability.

I recall that Les flew 501 several times in that 2-week run-up to Oshkosh 1972. On at least two of the flights engine problems caused a gliding, power-off landing.

Five-Oh-Wonderful was flown for just two months after the Oshkosh 1972 airshow. Rather than the typical stability and control tests, almost all those flights were evaluations of modifications trying to get acceptable reliability from its low-cost propulsion system. Along with those flights and for many months after, extensive ground tests were done trying to improve reliability.

N501BD's last flight was on October 8th, 1972. Flying with the short wings, it had an off-airport forced landing after an engine failure - the only time that Les failed to glide back to the airport following engine failure. Damage was significant and it was decided to not repair it so we could concentrate on finishing the construction of N502BD, a significantly better

airplane.

N502BD first flight was on March 26th, 1973. There was no flyable BD-5 for 5.5 months. The BD-5J jet first flight was July 20th, 1973.

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The Failure to Fly the BD-5B at Oshkosh in 1972

I had arrived at my new, Bede job in March 1972. At that time Jim Bede expected the new, all-aluminum stressed skin N501BD or what we referred to as “Five-Oh-Wonderfull,” would be flown in the next two weeks.

Jim needed that to happen in order to meet his promised kit delivery schedules. He was then looking at a quickly growing backlog of hundreds of people who had purchased the kits.

However, “Five-Oh-Wonderful” didn't make its first flight until July 11 of 1972, only three weeks before the big Oshkosh show where Jim wanted to unveil this new revolution-in-flight by having it fly during the evening air show in front of hundreds of thousands of aviation enthusiasts.

Nearly 16 months had elapsed between the first order for a BD-5 and the first flight circuit of the field, but the plane did fly and the development program was moving ahead.

Now, at Oshkosh 1972, it was going to be a difficult effort for us to be able to do a flight demonstration with Five-Oh-Wonderful because the airplane had only flown a handful of flights - with its Hirth snowmobile engine acting up just about every flight, sometimes causing a forced landing.

At any rate, we packed up Five-Oh-Wonderful, put it in a truck and drove it to Oshkosh the last day of July. Once there the wings were installed and it was displayed on a stand on the flight line. Tens of thousands of salivating aviation people stood, amazed at its appearance, its promised speed and it's low cost. The word was that a complete kit including engine and basic instrument would cost about $2400, and after 600 hours of homebuilder assembly using simple tools, you would have an airplane that could cruise well over 200 miles an hour. The appeal was contagious and the passion ran extreme.

Two clips from EAA’s Sport Aviation magazine, October 1972 issue.
Published two months after the August, 1972 Oshkosh show:

The Bede BD-5 was very much on hand but did not fly due to paperwork problems.

Jim Bede and his crew were very much on hand, with an elaborate display of kits, parts and engines in the exhibition building and the all-metal version of the much-discussed BD-5 right outside. Alas, it did not fly. Reason given by Bede was that two different FAA offices were passing the buck back and forth in regard to giving it clearance to fly at Oshkosh since it had not as yet done enough flying in its home area to enable the restrictions to be removed. Obviously, though, a lot of work is going into developing this aircraft and movies shown at the firm's booth shows the plane flying smoothly and capably over the Kansas countryside.

All eyes turned skyward every time the unusual Variviggen aircraft built by Burt Rutan of Newton, Kansas flew overhead. Even for a delta aircraft, it is odd-looking what with its auxiliary wing sprouting from the fuselage ahead of the windshield and large fins halfway out on the wings. But it most certainly can fly and we will all watch its progress with interest. By one of those strange

At Oshkosh 1972 I was there as an employee of the Bede aircraft corporation, helping Jim and Paul do the tent BD-5 presentations. Also, for the first time I was able to fly my VariViggen from Newton Kansas to the world's largest convention, tie it down on the Flight-line and fly it in the afternoon fly-by pattern. That week thousands of people got to to admire my stall-proof creation. This made me very proud. However, when compared to the fast, sexy, easy to build, low cost BD-5, the VariViggen was nothing special. I didn't have formal talks about the VariViggen, because I was there to promote Bede Aircraft products, not my personal little wooden homebuilt fighter.

Even thought it was risky due to the problems we were having with the Hirth engine, Jim really wanted to fly Five-Oh-Wonderful at the evening airshow.
However, the FAA did not allow us to fly at Oshkosh because it had not logged the 40 flight hours needed to be released from its restrictions - it was restricted to fly only within 25 miles of the Newton, Kansas airport, and to avoid overflight of high population-density areas. With hundreds of thousands of people at the Oshkosh convention, it made no sense to

make flights there, just three weeks after first flight.

So, at the biggest forum talk Jim said that his BD-5 is ready to fly but the FAA won't let it fly here. Some guy in the back stood up and yelled “go ahead and fly it anyway here's five dollars to help pay the fine”. Instantly dozens and then hundreds of people were waving dollar bills and saying Jim, break the law - when you get fined we'll pay the fine for you. Jim just smiled and promised that he would have an Open House event for kit customers, at Newton, Kansas in….you guessed it - “Two Weeks” !

What no one but Jim, Les Berven and I knew about, was that behind the scenes we were negotiating with FAA management at Oshkosh on what we would have to do to get permission to fly it at just one of the daily evening airshows, (the last one being just 4 days in the future). You need to understand, that this was 25 years before the Internet and negotiations with the FAA were then done only in person, or by the US Postal Service. We were asking the Kansas City FAA management (one step above the Wichita local FAA office) to relax the law that Wichita’s local FAA’s office was bound to enforce. Today that seems impossible, but this was the 1970s, when FAA was still following their full charter - to assure flight safety AND to Promote Aviation.

The FAA management told us if we would go to Kansas City for a meeting, they would prepare and present a list of things we would have to do in order for them to remove the restriction, allowing a flight demonstration at an Oshkosh airshow. We were not optimistic because FAA told us they had heard a rumor that Five-Oh-Wonderful had made forced landings at Newton caused by engine problems.

Les Berven and I jumped in Jim’s Beechcraft Baron, and flew to Kansas City. We took a cab to the FAA office and sat down in a small conference room with 5 or 6 FAA managers. They handed us a single-page document on FAA letterhead that directed the Wichita office to remove the Oshkosh restriction if they could observe, at Newton where the airplane had its Experimental Flight Permit, the following flight demonstration:

Make three flights, each one flying the planned Oshkosh Airshow maneuvers - taxi, takeoff, high speed pass, low speed pass with gear and flaps down, then a landing and taxi back to parking. After each flight the engine should be shut down and then started for the next flight. There shall be NO internal inspection, no adjustments and no maintenance of the airplane between each flight. Then, if a post demonstration inspection shows that the airplane is in a safe-for-flight condition, the Oshkosh Airshow restriction will be lifted.

They mentioned that our local FAA office in Wichita has received the same document.

Les and I called Jim at the Oshkosh Press Room’s phone and read him the FAA document. We then took another Cab to the airport, took off in Jim’s Baron and flew to Oshkosh. We were still not a bit optimistic, since just transporting Five-Oh-Wonderful, to Newton and back to Oshkosh would use up all the time before the last evening airshow. Arriving back at the Oshkosh Convention we could not find Jim, our other employees or Five-Oh-Wonderful. When we did locate them they were on the north ramp at Basler, a large general aviation maintenance and airplane charter company. https://www.baslerflightservice.com

Jim and others had the wings removed from Five-Oh-Wonderful and were loading it through a cargo door of a cargo-equipped DC-3 aircraft. Jim had chartered the DC-3 to fly Five-Oh-

Wonderful to Newton, where we could fly the demo in front of the local Wichita FAA folk, then to directly fly it back to Oshkosh. The two cargo flights would be done in the darkness of night. It was clear that none of us would get much sleep the next 36 hours. Les and I were already exhausted from our Kansas City trip as we got in the DC-3, closed the door and took off into darkness.

At Newton the next morning, we unloaded Five-Oh-Wonderful, put her wings on, ran the engine and added fuel for the three demo flights. Calling Wichita FAA when they opened, they agreed to witness the demo late in the day. I don't remember if any of us got sleep or food while waiting for the FAA.

When the FAA arrived, they parked their official vehicle on the ramp in front of the Bede test center. Les got in the cockpit, started the engine, took off on runway 18, retracted the landing gear and slowly climbed the overweight/underpowered BD-5 to enter the downwind leg of the pattern. Jim had called from a pay phone at Oshkosh and I placed the receptionist' phone near the entrance door and stretched the handset curly cord so I could watch the flight from outside while giving Jim a play-by-play description of the demo.

I will never forget what happened next.

Les was flying a high-speed pass over the runway . The noise was exactly like a chainsaw running at full throttle. Then, the engine quit at the worst possible time. If it had failed earlier he could have made an S-turn and landed into the wind to the south. If it had failed later he could have reversed course and landed downwind with lots of runway available. He decided to reverse course, landed downwind at higher than normal speed, over-heated the brakes and ran off the north end into the mud, failing the nose gear. The FAA arrived at the wreck just before us. One of them walked up to the propeller, turned it to confirm that the engine had indeed seized, then they got in their official vehicle and left without saying a word to us.

Well of course Jim wanted the airplane back at the show because a lot of the Oshkosh crowds come only on the last convention day. There might be 100,000 people at least that had not yet seen this new 'Revolution in Aviation' and Jim needed the airplane back on the flight line the next day for all to enjoy. So we hosed off the mud, repaired the broken nose gear, took the wings off and hoisted Five-Oh-Wonderful back into the DC-3. After loading a couple boxes of cold Pizza we took off into the darkness and headed for Oshkosh. This time we were all able to sleep on the cargo floor to the drone of those two R-1830 radial engines.

Back at Oshkosh our slightly worse for wear Five-Oh-Wonderful was put out on the grass for thousands of people to admire. At his forum, Jim simply inferred that there was a disagreement with the FAA and reminded customers that they could see it fly at the Newton Open House event in two weeks. The day after the show Carolyn and I got in our VariViggen, flew home to Newton and I got my team to work to make the Open House a success.

To the surprise of everyone, on August 19th, just two weeks after the Oshkosh show ended, we were able to do a flight demonstration of 501 at the Open House in Newton with all the kit customers invited. The only two-week schedule we ever made.

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My favorite photo taken during our BD-5 test program.
Crew chief Frank Andrews helps pilot Les Berven “put on” N502BD.
Tufts of yarn are taped on so we could see the in-flight airflow patterns.
Yankee chase plane is in the background.
Delmer and I discuss what looks like something critical -
we are not agreeing - he points up while I point right.
Engineer Don Hessenaur, complete with pocket-protector, listens from a distance.

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Note that on April 19th, 1974, when Burt became the first to fly a prop BD-5, it was in N502BD. It had been flying more than a year before anyone but Les Berven flew any prop-driven BD-5 (N-500BD was claimed to have flown, but that was only three brief hops less than a foot above the runway).

Besides Les, Burt was not the first to fly the BD-5. The Jet version, the BD-J was flown in September 1973 by Bob Hoover at the Reno Air Race event.

Contrast that to the Mojave RAF NGT (chapter 27), in which four pilots flew it the first day it flew: Dick Rutan, customer Wendy Schaller, Mike Melvill and Burt.

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A Crazy, Fast-Paced Period at Newton Kansas

Note that it took a full 3.5 months from the time that I arrived at Newton, Kansas until the “Two week” effort was done - to get the second BD-5 prototype flying.

Thus, in late July, 1972, I thought that my “year-long” sabbatical from my Air Force job might not be all that productive. I would get to fly my new homebuilt VariViggen to and at the big Oshkosh Airshow in a week, but the new BD-5 would be trucked to the show and could not

fly there.

Eight months later, the pace really accelerated. Here are the fun activities in just a five-month period:

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26Mar73 First flight of N502BD, the third BD-5.

5Apr73 Air-to-air photos N502BD for Air Progress. Just a week after 502's first flight.

April 73 Jet version of the BD-5 development program started. Project responsibility is Burt.

17May73 Les Berven & Dan Cooney flew Jim's DC-3 from Dallas to Newton.
Now, the BD-5s can be quickly demonstrated anywhere - Jim's Marketing dream.

24May73 FAA lifts restrictions on 502BD. It now can fly anywhere outside of Newton, Kansas

~June 1973 Demonstration of N502BD to Popular Science magazine. https://books.google.co.uk/books?id=5gxIBYlChPwC&pg=PA6&source=gbs_toc&cad=2#v=onepage&q&f=false

10Jun73 First BD-5B Demo at Reading PA Airshow. N502BD

20Jul73 First flight of Jet BD-5J. At Newton, Kansas.

28Jul73 Through 6Aug73. Oshkosh 73. Bede demos the Jet and the third prop BD-5B, N502BD.
The Jet Demo at Oshkosh is just 8 days after its first flight.

3Aug73 BD-5J thrust attenuator stuck during airshow. Les hits approach lights, big gashes in wing.
"Lets go to lunch, crashing makes me hungry"

9Aug73 DC-3 took BD-5B to Abbotsford, BC, Canada airshow.

1Sep73 Weekend Bede Open House. Flight demos of prop and jet BD-5 and Burt's VariViggen.

15Sep73 Bob Hoover flies the Jet BD-5J at Reno Air Races. The second pilot to fly a BD-5.

That crazy 5 months was a bunch of Fun stuff indeed. That passion was the main driver for my decision, seven months later, to not return to my Government job - to instead have the courage for Carolyn, Jetta, Kye and I to strike out on our own. To see if we could survive by founding our own small business in the Amateur-Built airplane industry. To run a company with good ethics and at the same time enjoy the Fun one has when working in an intense environment.

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The BD-5A/B Engine and Drive System

The first prototype BD-5, N500BD which did some runway hops in 1971 was powered by a 2-stroke, 36 BHP Polaris snowmobile engine. A Mercury Marine/Kiekhaefer 440cc engine was in the second prototype (N501BD) for its initial taxi tests in June 1972. Jim had bought both of these engines without discussing any production agreements from their manufacturers.

Before N501BD flew its first flight away from the runway it had a Hirth 650cc snowmobile engine. In spite of the Hirth's shortcomings for aviation (ignition and carburetor mixture issues), it was at the time, the only engine that was affordable for the hundreds of kits that had been sold at a guaranteed price. A custom Hirth engine with dual ignition was installed in the third prototype (N502BD) when it first flew in March, 1973. However, 13 months later when I became the second pilot to fly a BD-5B, the more reliable Xenoah engine was in N502BD. At that late date, just 3 months before I quit my Job at Bede, it was still uncertain what engine type would be shipped to the thousands of customers who had ordered kits. Kits were being delivered, but none had an engine.

Flying magazine in Sept 1973 published an article by Jack Olcott that reported - "Problems also developed between Bede and Kiekhaefer relating to minimum order size and financial commitments." The reality is that Kiekhaefer had refused to produce engines for the BD-5 kits for other reasons - forcing us to install a German Hirth snowmobile engine in N501BD for its first flights in July.

Here is the real story of why the Mercury Marine/Kiekhaefer engine that Jim Bede purchased for N501BD, never flew in a BD-5:

Shortly after I arrived in Newton, in March 1972, Jim Bede and I flew in his Baron to visit Mercury Marine's facility in Fond du Lac Wisconsin. Unable to land in Fond du Lac because the airport was below IFR minimums, we shot an ILS approach to runway 09 at Oshkosh. When we broke out of the low clouds we were shocked to see that we were aimed at an industrial area north of the runway. Instead of a proper go-around, Jim made a scary, very-low height jog to find runway 09. It would be 8 years later that I was to do training for and get rated for Instrument flight. But at the time I did not have appreciation for the fact that we could have been killed on that instrument approach at Oshkosh.

At our private meeting with Mercury Marine's imposing president, Carl Kiekhaefer, Jim laid out drawings showing how his engine would be installed in the BD-5. Kiekhaefer, said he did not like our proposed installation pointing to the rubber belt that reduced the rpm to a value that works for the propeller, he leaned over close to jim and I and said in a near-whisper "the world around, all rubber products are built by negroes". After a bit of silence Jim spoke next "well, this drive system is just a preliminary concept - we are also looking at other designs". Kiekhaefer then said there were other things on the BD-5 he did not like, and he would never supply engines to Bede that would be resold in airplanes.

Thus, another engine option for the BD-5 kit got discarded. On the flight back to Kansas Jim said little. He was clearly devastated that his best option for an engine for the thousands of kits being packaged in Newton was dead on arrival.

By summer of 1972 I had hired Dan Cooney and tasked him to do reliability tests of the low-cost Hirth 40-horsepower snowmobile engine, complete with the drive system with the rubber belt driving the wood prop, all mounted in a kit-production aluminum fuselage rear end without cockpit. Dan set up this test system on the Flight Test Center property, just outside the hangar on the north side. The noise seemed to resonate the steel build's sidings and my whole development/flight-test team complained. So, Dan just changed his work hours - doing the tests at night.

I checked with him when I arrived each morning and usually got a report of some kind of failure. On occasion during early tests, the drive components would exit the test stand forcefully, ie shrapnel. The fixes needed shop guys to fabricate parts and thus, I was finding even more difficulty in meeting the flight test schedules we had promised to jim.

Sometimes the propulsion failure was the fiberglass-reinforced rubber belt. Not just the heat and fatigue from the continuous cruise-power transfer, but the belt saw some seriously high loads during start up when it was at low rpm experiencing Torsional Resonance. The reliability tests were structured to match the typical flights expected: start, taxi, full power takeoff and climb to 10,000 ft, 75% power for 1.5 hours, descent, a 4-minute full power landing go-around, landing taxi and shut down.

After weeks of testing, Dan was finding that the BD-5 propulsion system that was currently being purchased in Bede's big kit production facility would build an airplane that had a high probability of propulsion failure in its first 10 flights.

We reported the rubber belt failures to the belt manufacturer, who reported them to DuPont, a materials supplier. I then got a phone call from DuPont, saying that they had been looking to find an application that had failures when using fiberglass-reinforced V-belts. He said they would send us some new belts for free if we would report our test results to them. They said they could not tell us what the solution was because the material used in the new belts was a trade secret.

The new secret belts looked identical, except on the side surfaces where you could see the white strands of fiberglass, this material was yellow. Our report to DuPont was that the belts were definitely lasting longer, but they were still failing.

When Jim learned we were testing a new secret material, he was excited - he could reinforce the Marketing theme that the BD-5 was in every way revolutionary, right down to new, super materials never used on airplanes before ! I helped him by making up a cover-story about the new material - the drive belts were made from "The Eyelashes of Nicaraguan Racing Spiders". It was a fun way to answer the obvious question of "what is the secret material?" Yep, I enjoyed bringing a bit of levity to our otherwise boring occupation.

Sidebar 1 - Of course, the world later learned that the material was Kevlar, not the The Eyelashes of Nicaraguan Racing Spiders. It was Kevlar's first use in power-transmission belts.

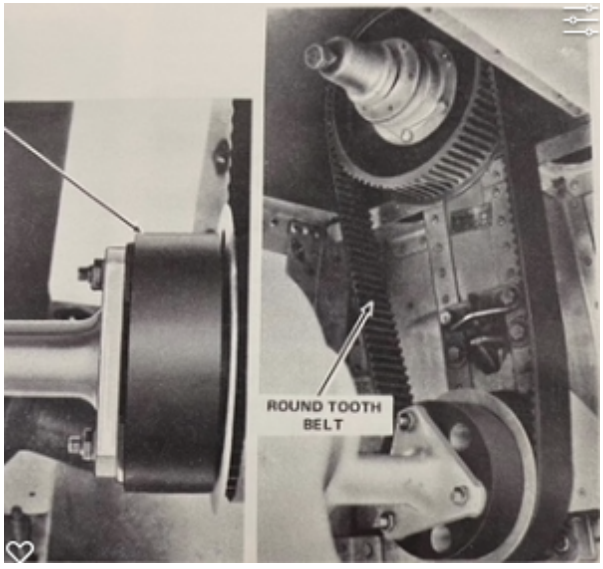
Sidebar 2 - 31 years later, I again used the "Eyelashes of Nicaraguan Racing Spiders" claim to answer questions about my secret material that coated SpaceShipOne, to protect its structure from the supersonic, Mach 3.5 thermal heating (chapter 35). For a very good reason, we never did release the ingredients of our secret thermal protection for SS1.

Once we abandoned the heavy Variable Speed drive and went to the lighter toothed belt that could not slip, the Torsional Resonance loads were so high that on startup we were breaking our drive shaft that extends back to the propeller.

We had no-one at Bede who knew how to calculate Torsional Resonance, so I sought out help. I have forgotten who came up with the solution for our Torsional Resonance problem but the idea was to install a sprag Clutch at the forward end of the long propeller shaft. https://en.wikipedia.org/wiki/Sprag_clutch

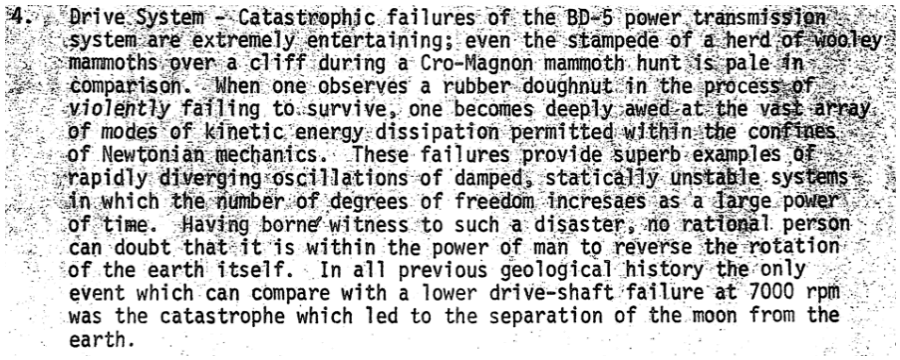
This totally eliminated the resonance and the big loads during resonance RPM during startup. Once installed, we could build a much lighter drive shaft to the propeller and we no longer had failures with any of the power-transfer components.

Engine at bottom, drive shaft to propeller and sprag clutch at the top:



The sprag clutch allowed the prop to spin freely in the event the engine seized. It made it impossible to start the engine by turning the propeller by hand. BD-5s generally start using electric starters, however one version we tested used a rope-pull, similar to your lawn mower.

The following screenshot is from an in-house update document titled “Test Center Activity Report”. It was sent to Jim Bede and 5 other Bede managers on May 2nd, 1974. It uses humor to describe the failures we were having during propulsion ground testing:



4. Drive System - Catastrophic failures of the BD-5 power transmission system are extremely entertaining; even the stampede of a herd of wooley mammoths over a cliff during a Cro-Magnon mammoth hunt is pale in comparison. When one observes a rubber doughnut in the process of *violently* failing to survive, one becomes deeply awed at the vast array of modes of kinetic energy dissipation permitted within the confines of Newtonian mechanics. These failures provide superb examples of rapidly diverging oscillations of damped, statically unstable systems in which the number of degrees of freedom increases as a large power of time. Having borne witness to such a disaster, no rational person can doubt that it is within the power of man to reverse the rotation of the earth itself. In all previous geological history the only event which can compare with a lower drive-shaft failure at 7000 rpm was the catastrophe which led to the separation of the moon from the earth.

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The Critics:

After the Bede enterprise went bankrupt in 1977, critics tended to blame Jim for applying his talented technical team to fun distractions like airshow appearances, the Jet, the BD-6, the helium hang glider, etc, rather than focus on fixing the problems on the BD-5A/B, which had many thousands of customer kit backlogs.

The critics did have a point on how Jim spent his money. Jim loved airplanes and it seemed he bought them wether or not he could afford them. The Experimental Aircraft Association (the Oshkosh Convention folk) had a contest, offering a new Bellanca 7ACA Champ (https://www.planeandpilotmag.com/article/bellanca-7ac-champ/) airplane to the person who was responsible for attracting the most new members to join EAA. Jim added “Join EAA” to the tens of thousands of advertising brochures he mailed to prospects. Voilà, Jim now owned another airplane he did not need. Because I had soloed a Champ at age 16 in 1959, I had a warm place in my heart for the tail-dragging Champs. My logbook shows I had many flights in Jims, 7ACA Champ, including giving rides to new, non-pilot employees on their first day at work. Yep, Fun was important in Newton.

I once made the following observation - at the time that Jim owned ten airplanes:

- One Douglas DC-3
- One Beechcraft Baron
- One Piper PA-31 Navaho
- One American AA-1 Yankee
- One Bellanca 7ACA Champ
- Two BD-4s
- One BD-5B
- One jet BD-5J
- One BD-6

Also, Jim’s employees owned airplanes - Lloyd Brekke’s BD-4, Dan Cooney’s two airplanes (Cessna 172 and Lake Amphibian) and my VariViggen.

I calculated that the company’s airplanes had just enough seats to be able to takeoff together with every one of the 77 employees. I also noted the strange coincidence that the company had exactly enough properly-rated pilots to do the piloting of all the 14 airplanes.

So, I started a rumor that said “Jim had a plan for everyone to grab the customer deposit money and use the 14 airplanes to fly to Mexico in the darkness of night”.

(actually a 'Tongue-in-Cheek' comment in humor, like that note I had written on Jim's office chalk board).
My Mexico-escape rumor later broke down as the number of employees increased above 85……..

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Jim Bede, a Marketing Genius - The Playboy 'Exposure'

The second prototype, N501BD was flown for only about 2.5 months. It was grounded after only flying about 30 flight hours. Its last flight was when it had an engine failure while flying with the short "A" wings. Unable to do a full flare, it hit hard on a road, wiped out the landing gear and killed a field mouse as it slid into a ditch.

However, for Jim it had been a huge success - The public had seen it in flight and air-to-air photos of it had been published in a hundred world publications - magazines, newspapers, etc. Les had even flown it wearing a blond wig, to get a flight photo to go along with hangar photos of a nude model, shot while she was sitting in a BD-5 fuselage shell.

The Playboy model came from Kansas City. Of course this was an exciting day for my engineers and mechanics who were told to stay in the office, but several did peek into the shop through a cracked-open door. Receptionist June Myzk was invited to watch the nude photo shoot, but she declined. The flight and nude shop photos were published in an article in Playboy Magazine, announcing this up-coming exciting Revolution in aviation, inferring it was so easy to fly that even a Playboy Bunny could fly it. The article ran in the May, 1973 issue.

For Jim, this was huge - he boasted that this one article would sell more airplane kits than the hundreds of articles in aviation magazines for the last two years. This was marketing genius indeed since we were reaching an audience size never seen before in the history of aviation. To understand Jim's point, consider that 1972 was 25 years before cell phones and internet communications. Marketing then did not resemble what we see today - the Playboy Magazine subscriber list was huge then.
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The DC-3 Flight to Oshkosh, can Paul Hand-Prop an airliner?

EAA President Paul Poberezny piloted the Bede DC-3 from Newton (Bede HQ) to Milwaukee (Paul's home) on June 6th, 1974. Paul had lots of experience with DC-3 military version, the C-47.

Les Berven was in the right copilot seat. Paul, who hated to talk to FAA, tried to make the entire flight without an IFR flight plan, where legally we had to always remain clear of clouds. Les Berven, who would have filed with FAA for an instrument flight plan, was in the copilot seat. I was in the cabin behind the cockpit with Herb Iversen and Microturbo's VP Frenchman Fred Ladjimi.
Since we were clearly flying very low to avoid clouds, I unstrapped and entered the cockpit to see how Paul was handling the worsening weather conditions.

It was getting dark as we flew north and the cloud ceiling was lowering, which is a very dangerous flight condition for the vintage airliner. So Paul, instead of using the radio to file an FAA Instrument flight plan, did something that shocked Les and I: He brought out his hearty, loud Russian accent and announced (without using the radio) "***By the authority granted me by the Experimental Aircraft Association, I pronounce this aircraft IFR***". He then climbed up into the clouds.

I think no-one in the airplane knew the altitude of the cloud tops, so we were just guessing when (or if) we would break out into clear skies above. To me it seemed forever but the clouds soon cleared below us. Since we had a forecast of visual weather conditions at Milwaukee, our destination, we continued without contacting FAA until requesting landing instructions from the control tower about 5 miles from landing. Not a normal flight for an airliner.

Paul was not feeling well, so we decided to wait at the airport until his ride showed up. He

had flown the BD-5B earlier in the day, initially touching the ground with the gear up, going around and doing a proper landing

The pay phone where we parked the DC-3 initially failed to work, so we all knew we would be in for a very late second flight that night. We had all been fatigued even before landing at Milwaukee. We did not have the option to sleep in Milwaukee, since the BD-5J jet we had on board was scheduled to do a flight demo at Reading in the afternoon…another near-impossible Bede schedule.

Our second flight that night, Milwaukee to Reading, PA, started after midnight. The safest route would be to initially fly 100-miles south to Chicago, then directly to Reading, making it a 4.5-hour journey. Needing sleep, we decided to go direct, taking us over Lake Michigan where in darkness we would have no visual ground references for the first 80 miles.

Les Berven was pilot and Bede engineer Dan Cooney was co-pilot. Both had very few pilot hours in the DC-3. Finally it looked like Herb, Fred and I could get some sleep…or at least we thought.
Leaning back in a forward facing right window seat I looked at the right engine and noticed a small fire somewhere in its accessory section. I jumped up, ran to the cockpit and yelled "Fire in the right engine" then turned around to watch if the fire was getting worse.

Following the Emergency Procedure, Les told Dan to pull the fire-bottle handle on the right engine. This handle shuts down the engine, feathers the prop so you can fly level on one engine and dumps some fire retardant into the engine cowling.

Dan swung around to the right where he could see the right engine, and seeing that it looked perfectly normal could not bring himself to follow his pilot's order. He ran back to join Herb and me watching the fire. Fire now confirmed, he returned to the cockpit and pulled the fire-bottle handle.

We were near maximum gross weight - full fuel, passengers and cabin cargo. Looking into the darkness with a yawed single engine airplane that could just barely maintain altitude and no visual references, Les skillfully reversed course and lined up for a down-wind landing on the runway we just took off from three minutes ago. The fire had gone out, but it was clear to all that we would fail to get Jim Bede's jet to Reading in time for its flight demo. There was no way we could get a DC-3 mechanic to look at it in the middle of the night.

You cannot taxi a DC-3 single engine, so we asked for a tow-bar and tow truck and finally got it to the ramp where we had let Paul out. Knowing that Paul was sick and it was after 2 in the morning, I almost did not go back to that cranky pay phone to call him. However, it was obvious that Paul might be the only person around that had experience fixing a DC-3. He answered, saying "***I will be right there"*** and then hung up. We all were expecting to find a motel and get some sleep, but we had the EAA President racing to join us.

To everyones surprise, Paul announced we have good news - what happened was common for DC-3s, and it is easy to fix. The fire was burning insulation in the accessory section. After tightening a loose pipe connection and removing burned material, he announced we were probably good to go. Showing off, the sick EAA President said that he would show us that it is possible to hand-prop a DC-3 ! We argued that hey, there was nothing wrong with the starter as Paul lined up to a prop blade and walked it through a couple times before calling "***Contact***".

I would like to say that he did get it started, but he did only enough to show us that when he was younger and healthy he probably was indeed able to do it.

After some extensive successful ground-running of both engines, we took off and again headed out over Lake Michigan. It was a nice day at Reading when we landed and we all collapsed.

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The Bede helium hang glider
A failed assumption and lack of analysis.
During the era/rage of early hang-gliders.

This photo looks like a parachute at the moment the skydiver touches the ground.
However this is a static picture.
The guy is just standing there under a weird contraption overhead.

The contraption is actually an expensive custom helium balloon, shaped like a wing-configuration parachute. Helium is hard to contain, it leaks through the smallest opening. So, every time you use this thing you have to top off the helium.

Why would you build one of these? The reason is that your boss, Jim Bede told you to. Keep in mind that flat Kansas is the worst state to enjoy hang-gliding, which was the rage of the era. A hang glider enthusiast had to drive an hour west of Wichita in order to jump off a dam that was only about 20-ft higher than the ground below.

Here was Jim's reasoning:
The high-jump record in 1971 was 7.5 feet. If he could reduce his weight by 80% a world-class high jumper should be able to jump 5 times 7.5 feet high = 37 feet high. Hey, he could easily jump over a house. That way, surely even Jim could enjoy hang gliding in

Kansas !

There are several things wrong with this reasoning:
When starting his jump, a high jumper has his cg about 2.5 ft above the ground. To clear the 7.5 foot bar his cg has to be about 0.5 ft above the bar. So in reality he jumps his cg up about 5.5 ft up, not 7.5.
However, the big difference is the balance of air resistance of the balloon/parachute with the vertical speed.
Of course it should have been obvious that this was a dynamics problem, not a linear static one.

Basic physics - to reach the desired 5.5 foot height change, the jumper must leave the ground with a vertical velocity of 19 ft/second.
At 19 ft/sec, the aerodynamic drag of the balloon/parachute is about 270 lb.

So, for the jumper + balloon system to reach a height of only 5.5 feet the jumper must have an additional 270 lb of leg strength, AND the ballon harness and all its small lines must be able to stay stiff while pushing UP on the balloon.

Bottom line:
With Jim's helium-assist jump system, the balloon stays put with slack lines when a world class high jumper makes his 5.5-foot rise. That is why you never saw this system in any of the press releases or newsletters from Bede Aircraft. The balloon jump testing was done in secrecy at Delmer's farm, out of sight for those trying to get a glimpse of the Bede progress at Newton.

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Bob Hoover - Second to Fly a BD-5

Ever the showman, Jim Bede asked Bob Hoover to demo the new BD-5J jet to the Reno Air Race crowds on September 15, 1973, even though the jet had its first flight only seven weeks before. Bob Hoover had never before seen a BD-5. Bob would be the second pilot, after Les Berven to fly a BD-5.

Sidebars:
Legendary Bob Hoover (https://en.wikipedia.org/wiki/Bob_Hoover)

National Championship Air Races in Reno (https://en.wikipedia.org/wiki/Reno_Air_Races).

Unveiling the new jet at the east end of the Reno Air Race flight line, Les Berven taxied it by the crowd and just for some added humor, someone was walking alongside it with a radio control transmitter in his hands. As he moved the joysticks with his thumbs, Les did some taxi turns the whole length of the flight line, so the crowd in all the grandstands could see it up close. With the RC pilot walking near the jet, the crowd could tell how tiny it was.

When the time came for the Bob Hoover aerobatic demonstration, he showed up and climbed into the tiny cockpit of our new jet. Les leaned into the cockpit to brief Bob on how to operate the airplane - for example there were two things for the engine besides the throttle - one was a switch that was labeled 'off and run' and the other was a button that

said ‘start’ so of course Les briefed to Bob Hoover that you flip the switch to ‘run’ and you push the button ‘start’ and within about 15 seconds the engine would be up and running at idle and ready to fly.

After Les described limits of the airplane (stall speed, and maximum-g maneuvering), Bob had just one question - what is the entry speed for an aileron roll? Les told him160 knots, but he failed to tell him that to get to 160 knots you first have to do a dive to pick up more speed than you get in level flight. The prototype TRS-18 engine had only 200 pounds thrust at sea level, but only about 135 pounds that hot day at Reno, (density altitude of 10,000 feet) so the jet was far from “high-Performance”.

Because of some air show restrictions the approved runway was to takeoff going east to west even though it meant taking off with a tailwind. Bob, used almost the entire runway for his takeoff roll. He left the airplane on the ground way above the stall speed .Those tiny little tires were at an RPM that they had never seen before. Bob expertly lifted the nose and then instead of climbing, he kept the airplane just a few feet above the ground as he turned, flew north out of the area and disappeared from view.

A few minutes later he appeared over the field and demonstrated some precision aerobatics - loops, aileron rolls, barrel rolls and Cuban 8s. We, along with Jim were delighted with the fact that the worlds greatest pilot had just demonstrated precision aerobatics in our tiny new jet in front of a very large crowd which included many aviation Journalists.

We quickly figured out that Bob had actually planned to do an aileron roll immediately after takeoff. Disappointed in the performance, he had flown out of site just hugging the ground. When out of site he had climbed to an acceptable altitude so he could dive for the aerobatics, then flew back to do the great demo over the crowd.

I later found that doing a roll immediately after lift off in an airplane he had never flown was a Hoover Trademark. Bob had done this in the Soviet Union when the Ukrainians allowed him to fly their best aerobatic airplane during the World Championship Aerobatics Competition. The Soviets, using a language translator had asked him to stay over the field and observe the strict safety protocols they flew under. However, at lift-off Bob immediately did an aileron roll, flew over a line of trees and remained out of view. The Soviets were running around like Keystone Cops thinking he might have crashed. After more than ten minutes he appeared over the field and demonstrated precision-flown aerobatic maneuvers. On landing he complemented the hosts on a well-designed airplane. They never again let Bob Hoover fly their Aerobatic airplanes.

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The Jim Bede Charisma

When Jim approached anyone - a stranger or an old friend, he would usually tell him a joke. Sometimes the jokes would be crude, but they were always funny and today most would be considered not Politically Correct. If young people met him today they would be shocked and offended. But, this was the early 70s - a very different world than today. It was clear that he enjoyed life and was good at spreading humor to everyone. However his more important character was his ability to sell, or what some called ‘Snake-Oil’ talent.

I have to admit that while I was an employee in Kansas, I thought of Jim as being a clever, enthusiastic, successful Marketer, but I did not consider him to be generally corrupt. Once I was away from Kansas, my opinion changed. No question - Jim's personal charisma was hypnotizing.

An example - After the Hirth engine seized in front of the FAA in August of 1972, many of the employees were depressed. Most worked at the huge kit manufacturing building and had not been paying much attention of the test program further north up the ramp at Newton airport. They had been told that their job was to assemble and ship kits for thousands of complete aircraft as soon as possible.
By this time the Bede aircraft company at Newton had about 60 employees, most of them working at the big new building where the kits would be assembled and shipped to the customers. When the word got out about the in-flight engine failure, most essentially concluded in their own minds that it just wasn't gonna work to use a snowmobile engine in an airplane. A large number of the employees were depressed, thinking that their jobs might soon be in jeopardy.

To respond to this crisis, Jim did a phenomenal job to fix the depression at Newton. He announced that the next day no one should bring their own lunchbox and that he was buying lunch for everyone. He laid out a nice big spread in the big building. He had a table in front of him with a microphone so he could be heard and on the table were all the parts of a Hirth snowmobile engine.

He had disassembled every piece and laid them out on the table. As people were finishing up lunch he announced that he had an important message for everyone. He picked up the crankshaft of the Hirth engine saying "see this part? This is the heaviest most stressed most important, most difficult to manufacture and most highly engineered part in the entire engine". He held it high above his head and stated "this part is perfect!". Then, one by one he went through every part of the engine and pronounced them all to be perfect.

At the far end of the table was the piston which had seized by welding itself to the cylinder as N501BD flew by the FAA observers (to hopefully get approval to fly in front of 300,000 people at Oshkosh the next day in Wisconsin). He picked up the piston and turned it so you couldn't see the damage, noting that "this part is nearly perfect. Its precision bearing for the rod and its lubrication and its design are perfect". Then he turned the piston around to show the seizure and said "the only thing wrong with the engine is this tiny spot right here. That's just a simple engineering design problem and it'll take no time to fix. And once we do, the Hirth engine will be a reliable power plant for our revolutionary new era of aviation!".

While a few of the crowd of 60 were muted, most of them jumped to their feet, waved their hands in the air and cheered. By buying lunch and using his world class charisma, Jim had turned depression into excitement and the employees went back to work.

A similar story was told to me by Al Thompson - where at a 1976 Dealer Meeting in Wichita the dealers had voted to sue Bede for contract issues including late deliveries. Bede entered the meeting, told them about other companies who had slow startups. He said everyone in this room will be Millionaires - They all then jumped up and cheered.
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The BD-5D - A Certified, Factory-Built Aircraft.

Jim did it again before I left in mid 1974 - he defined something that didn't exist and he took $400 deposits on it from thousands of people. They eagerly paid the deposits because he promised that the money was refundable if he did not deliver. That thing was a BD-5D it was a certified production BD-5. Your deposit would guarantee an early delivery date. Hey, airplanes take time to certify and produce and if you do not get in early it might be 5 years or more before you will be able to enjoy this revolutionary, sexy airplane that will fit in your garage and be super cheap and easy to fly. A reason that many thousands joined in, can be found by studying the offer he published in early 1974:

BEDE AIRCRAFT INC.

Dear Fellow Flying Enthusiast,

This is an open letter to everyone who loves flying and would like to help general aviation.

Our new BD-5 has created a great deal of interest and we are extremely pleased and proud of its performance. Since the design is so outstanding, I have decided to fully certificate the aircraft and go into production.

A completely manufactured BD-5 will, of course, cost considerably more than our homebuilt model. But since I cannot accept the statement that flying is and must remain expensive, I want to offer a program which will break the 'cost barrier'. It is simply that the savings achieved by mass production will be passed on directly to the flying public. These savings can be substantial with increased production.

We will start the program by accepting orders now and until April 1, 1974. The total number of orders received by that date will determine the cost of the BD-5D. The more orders the lower the price. The price will be determined by a formula in which every single order will contribute to lowering the final price. Here are some examples of the formula:

5,000 aircraft ---	$ 7,217
10,000 aircraft ---	$ 6,450
20,000 aircraft ---	$ 5,682
40,000 aircraft ---	$ 4,914
60,000 aircraft ---	$ 4,465
100,000 aircraft ---	$ 3,900

I ask, therefore, that if you have ever dreamed of owning your own personal aircraft now is the time. If everyone who possibly can would order a BD-5D before April 1, 1974, we can all pull together and appreciably reduce the cost of a new aircraft. We have never before had the opportunity to directly affect the cost of flying so appreciably.

A $400 deposit will secure your order and establish a specific aircraft serial number. Delivery of the first production aircraft is planned for August 1974. If you would like more information and complete details about our program send $1 to the address below or if you want a complete information kit on the BD-5D please enclose $5.

I am asking your help to participate in building a whole new generation of modern aircraft.

NEWTON MUNICIPAL AIRPORT, NEWTON, KANSAS 67114, U. S. A. : (316) 283-8870

The appeal that you might be able to buy an airplane for less than the price of a car, and fly to America's 18,000 small airports at 240 miles per hour was mesmerizing indeed. Hey, you could even learn more by sending in just one $ or five $. And, the message was clear - a huge number of orders will ensure that you all can indeed afford it.

The key dates on this offering are 1 April, 1974 and August, 1974. He would determine the price of the production airplane on April 1st, depending on how many people committed to buy one and sent in a $400 deposit. Huge numbers of orders would assure a delivery of a certified airplane **for only $3,900!** The offering also said delivery of the first production airplane is **"planned for August 1974" !!!**

April 74 of course is when Jim knew he would not be able to pay our salaries in Kansas or the building mortgages. The totally insane August date for me was a stark reminder of what I wrote on the chalkboard in his office when I moved into it on my first day as a Bede employee in March 1972. My employees at the Test Center guessed it was just my version of a funny joke - **"The difficult we can do in two weeks; the impossible we advertise**".

Jim was well aware of how difficult and expensive it is to get FAA permission to build and sell airplanes to the public. He correctly assumed that the tens of millions of dollars to just get to an approval might be impossible to raise.

However, Jim had a solution for this show-stopper - The certification program would be done in New Zealand because their version of FAA would be real easy to work with. The carrot would be that, in the production program, some significant parts of the airplane would be manufactured by New Zealand companies, producing thousands of high-paying jobs for their economy. The promise of NZ jobs could attract NZ investors to pay for certification costs. Hey, a Win-Win situation for everyone !

Oh, the brilliance of Jim Bede. He was able to determine the production pricing of an airplane long before its certification program was even started ! He even knew the amount of reduction in manufacturing costs as a function of sales volume. Hey, these numbers must be precise because they're shown in four significant figures.

Of course, we were later to find that Jim did not need the price values at all, since the production program was merely a plan to make immediate money in order to keep the company alive. Without it, Bede Aircraft would've gone bankrupt years earlier than it did.

After I left in 1974, the money-generating scheme evolved further by introduction of his brilliant Red Carpet Club where Jim made millions in just 3 weeks. Every Bede employee I talked to after I left said they had no idea of the RCC until it was announced. One wonders if any one besides Jim was aware of it.

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TOPIC 7). BURT'S BIG DECISION

The Decision to Quit my Kansas Adventure and Start a New Company

After logging 200 flight hours on the VariViggen in late 1973, I setup a drawing board in my bedroom, prepared a cursory set of plans for building it, had them printed and started selling them. Those plans did not have step-by-step instructions, so they were aimed at only experienced homebuilders - those able to sort out details on their own when given basic definition of the structure and systems. This was then considered a part time, moonlight job, not a profession. I sold the cursory plans for just $27.

In the spring of 1974, the plan for the non-existent, Certified Production BD-5D was something I wanted no part of. I was young, but old enough to be thinking about my legacy. I could scamper back to my great Air Force Job in California desert, or maybe I could find a way to work in the Amateur-Built airplane industry and continue to have fun. A big problem with the first option is that my next promotion at Edwards Air Force Base was a job that would not be as Fun as the one I left in 1972. I would be a manager - the supervisor of the engineers who have Fun flying in the test airplanes.

As the summer approached. Jim, in spite of the BD-5D income, again found the company in a financial bind, and was using the BD-5D deposit money to pay salaries and other expenses. Sales of the BD-5 kits flattened, rather continuing to skyrocket like they had for the first 3 years. Schedules for delivering the kits stretched out when flight testing uncovered more unexpected flaws, requiring modifications.

Bede initially started delivering BD-5A and BD-B kits for only the tail and wings. Cardboard boxes were being loaded on trucks, but they represented just a small fraction of the value of a complete kit and sometimes the boxes were filled with things that cost more than any customer had paid. The custom dual-ignition Hirth snowmobile engine (the only one cheap enough) was still having reliability problems. In the fall of 1974 the Hirth company went into voluntary liquidation.

Facing my ‘what to do next’ dilemma, I really wanted to start my own company in the homebuilt airplane industry. I had a passion for my solution to the stall/spin accident problems of airplanes that did not have the stall-limiting feature of my variViggen.

But I knew I would not be able to support my family by just selling plans for the Variviggen. It was too complex to build, so I knew there would be very few of them completed. I wanted to develop my MiniViggen, a BD-5 size canard airplane. It was a design that had I toyed with since before moving to Kansas, but with the demands of my job I had made little progress on maturing it.

I talked about my dilemma with my father Pop and he encouraged me to start a new company, offering $15,000 to fund my startup effort. That did it. Carolyn and I would start a new business, initially selling VariViggen plans and some parts. We would sell nothing before flight testing was complete, and when we knew our costs, so we could be assured profitability. I would be able to develop the MiniViggen, knowing the 15k$ would allow us to survive for two years without any income from it.

We decided to call the company Rutan Aircraft Factory. We published a newsletter called Variviggen News. It was mailed to those who had expressed interest in the Variviggen, based on seeing it for two years at Oshkosh and reading the many magazine articles

published about it.

First RAF newsletter, May 1974.
While we were still living in our Kansas home.
We would soon be moving to Mojave California.

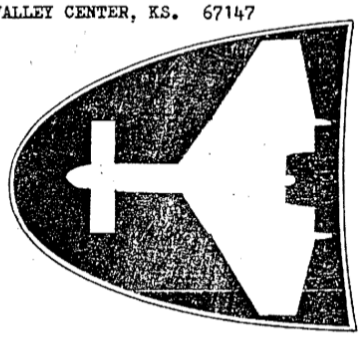
VARIVIGGEN NEWS NO. 1

MAY 1974

RUTAN AIRCRAFT FACTORY/P.O. BOX 111/VALLEY CENTER, KS. 67147

THE NEWSLETTER

staff has finally organized: Burt Rutan, Editor-in-Chief; Carolyn Rutan, Proof Reader. This, being the first newsletter, will be mailed to all holders of VariViggen Tech. Reports and Plans. Future newsletters will be mailed only to those who actually plan to build an airplane and who have an Aircraft Serial Number assigned.



This is your newsletter, the sole purpose of which is to aid in your construction projects through exchange of information. Please feel free to send progress reports, comments, or photos of your project for printing in future newsletters.

ACTIVITY at the RAF - Carolyn and I have spent a busy Fall and Winter preparing the plans and getting them mailed. My apologies to those who waited several months. Our prototype, N27VV, has passed her 300th flight-hour, and our latest inspec-

With the courage to make it on our own, Carolyn and I in August 1974 at Oshkosh a month after quitting my job at Bede. We did not have a booth, we just offered information on Variviggen - in a box hung on VariViggen canopy rail. Note the broad smiles from two people who had just escaped the demanding job at Bede and were looking forward to being on our own. The hand gesture meant a bit more than silly humor.

TOPIC 8). AFTER MY BEDE EMPLOYMENT.

Chapter 19, Rutan Aircraft Factory, details my journey immediately after quitting Bede. However, the following Bede-related stories are more relevant to this chapter:

From EAA's Sport Aviation magazine, October 1974:

(Photo by Lee Fray)
Oshkosh '74 saw the first appearance of the short wing BD-5. N-502BD was flown with both long and short wings during the Convention.

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The Bede Red-Carpet Club

In the fall of 1974 Bede was financially surviving only because he was spending the refundable BD-5D deposits to pay his cash needs. Any honest accessor would have recommended bankruptcy. To those observing, Jim still seemed convinced that the road ahead was paved in gold, because he showed an outward belief that he had started the biggest revolution in aviation history, and thus it would eventually make him a fortune as well as cement his Legacy.

I have no idea if his solution to survive was something he had in mind when he first announced the production BD-5. However, the solution brought his business ethics to an even lower level. He invented a trick - one that made him several million dollars in less than two weeks.

The trick was called the Red Carpet Club (RCC). If you we're in the club you automatically get a discount on your BD-5D production airplane by… you guessed it, $400. The club membership was free if you had an order for a BD-5D, and had paid your $400 deposit. If you were not a BD-5 customer, you could join the club for $400.

RCC club members were promised a number of benefits:
1) You would be given a 'members-only 1-800 phone number that you could call at any time and hear the lasted news - a recording describing what was happening at the Bede Test Center, including the latest flight test results. This seems strange until you realize that 1974 was more than 25 years before the public was browsing the internet with Google. Things as large as the BD-5 revolution could not be supported by personal phone calls. The public got information only if/when the company wanted to do a press release.
2) Your price for a production BD-5D would be discounted $400.

3) You were promised future discounts when you ordered communication and navigation avionics for your airplane.
4) You would be considered a VIP by the Bede company, with un-defined benefits.

All this seemed compelling to the BD-5D customers and immediately they signed up. Few realized that they had given up their REFUNDABLE deposit, in exchange for membership in a club, that had no promises of refunds if the company did not deliver their airplane.
For people who had been considering buying the airplane, the club offered attractive benefits, while delaying their commitment to purchase.

I never did learn what happened to the Red Carpet Club members, some got wrapped up in the lawsuits that finally drove Bede to bankruptcy in 1977.

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The Reunion Party. In Mojave, 20 years after the design of the BD-5.

In 1991, 19 years after I arrived in Kansas, someone found a reason to have a California Bede Aircraft reunion. The reason was to celebrate the 20th anniversary of the design of the BD-5. I managed to attract many of my old 1970s companions to gather in our little California desert town of Mojave. It was my opportunity to show my Kansas friends what I had accomplished in Mojave after quitting Bede Aircraft.

There were two venues: Scaled Composites' flight test hangar, where we were able to show our old Kansas 1972 Bede friends several of our latest research airplanes and then to my home (the Mojave Pyramid) for dinner and a relaxing environment.

The last time I had seen my close friends Jim Bede, Les Berven, Herb Sawinski, Lloyd Brekke and Rob Absher together had been 17 years earlier in 1974 at Newton, Kansas.

For many there, including me, this was our last opportunity to interface with Jim Bede. I did later see him when he occasionally appeared at Oshkosh, but I do not remember talking to him on those occasions.
However, he continued to design many new aircraft (https://en.wikipedia.org/wiki/Jim_Bede#Bede_Design). One, the BD10 was advertised as a supersonic homebuilt. Several of these were built. None came close to flying transonic or supersonic. Crashes took the lives of three BD10 pilots, including an executive of the distribution company.

Bede died of an aneurysm on July 9, 2015 in Cleveland, Ohio, at age 82

Fun stories for this party are still being received from the players who are still alive. Also, in addition to my 10 photos, they have promised to send more. I will include thier fun stories in a future Chapter 18 update.

Ron Absher Jim Bede and Herb Sawinski at Scaled.

Les Berven and Burt
In the Scaled flight test hangar.
With Model 143 Triumph Business Turbofan.

Les Berven, Bede chief test pilot, relaxing at the Pyramid.
Les died at a young age:
https://archive.seattletimes.com/archive/?date=20011223&slug=berven230

Judy Zivko (Bill Zivko's wife), Rob Absher and Les Berven.
http://www.zivko.com/about-zai/

Herb Sawinski
https://airfactsjournal.com/2013/02/a-dream-of-the-1970s-the-bede-5/

Airshow pilot Debbie Gary and Lloyd Brekke.
https://en.everybodywiki.com/Debbie_Gary_Callier

Pop Rutan with Pyramid Perpetual Motion Wheel.

Delmar Hosteler (yellow shirt), LuAnn & John Guernsey

Al Thompson, a designer at Bede Aircraft, Kansas.

Some managed to fly BD-5s using the shipped, partial BD-5 kits

Several small business were formed that completed the process that Jim had started. They

used the partial kits from Bede, developed their own engine, and sold complete kits, engine included. A few of these did fly and it is estimated that about 30 or 40 propeller BD-5B aircraft are airworthy now in 2022.

The more successful follow-on versions have been the Jet BD-5J. Many have been built, mainly for airshow teams where they perform aerobatics, solo or in formations of three. Bob Bishop, clearly the high-time BD pilot has a company that contracts with the military. The flights are important because the radar signature of a jet BD-5 is similar to an adversaries cruise missile.

Also individuals have had BD-5J jets built for their private use,
the most notable is author Richard Bach.
Here is his report, written in 1977.

As some of you may already know, the Bede Jet Corp. has recently gone bankrupt. No one, other than Jim Bede and his creditors, knows for sure the true story behind this, but there are certainly many people out there who for the most part have no idea what they are talking about. and yet feel qualified to take potshots at Jim Bede, basically kicking him when he's down.

Steve Kerry, a British citizen, posted this message on **rec.aviation.homebuilt** a few days ago in response to some of the idiotic bashing of Jim Bede on that newsgroup.

Perhaps this is a good time to remember an article from FLYING magazine, January 1976, titled "The Egg and the Coffin". The author is Richard Bach, author of Jonathan Livingston Seagull, and owner of the world's first privately owned BD-5J. The snip below is part of a 10-page article, recommended reading for anyone interested in the BD-5J.

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If I were a country set to build a super-secret black-phantom
airplane, one that would make all the world blink and say, O, there
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is one person on the planet I'd choose to design that airplane and that person is Mr. James R. Bede, of Newton, Kansas. Mr. Bede would design for a while with a napkin and a pencil and with his pocket Univac and then he would say in a very calm voice that he can promise me a machine that will fly at speeds of nearly 6,000 miles per hour, with a range of 20,000 miles, that will build simpler and fly lighter than any phantom-plane ever built and this machine is only going to cost me $379.95 per each. All the other nations of the world would laugh at Jim and me. What a pitiful sight, that poor little country taken in by a smooth promoter. Impossible, and everyone knows it: the man can't deliver an airplane that will fly like that. The other nations would build good, normal aircraft and say impossible, impossible, that Bede fellow. And you know? They would be absolutely right . . . James R. Bede would not be able to deliver what he promised.

What he would deliver, far short of the illusion-machine on the napkin, would be a phantom-plane that would cruise a mere 3,600 mph, with a range of only 8,000 miles, that would cost $4,100 per each, bare, without radios. It would arrive three years late, and it would fly better than any airplane in history. And the other countries would say, "We told you so! Your airplane he built for you is 2,400 miles per hour slower than he said it would be! It doesn't have that unbelievable range, not by a long shot, old fellow, and it is costing you 10 times more than he promised you!" And I would smile and say, "True. How good are your phantom-planes, other countries?"

They would sigh and say, "About half as good."

My phone would ring then, and why, it's Jim! To sell me a new design that will fly 20,000 miles per hour, 100 miles in the air . . .! I'd know what those words mean, I'd know from those words how the airplane would really fly, and I'd tell him, "Jim, do it."

But should the man ever say to me, "Hi, little country, how about me starting a factory for you? I want to make simple, plain Piper Cubs, on schedule," I'd be forced to stare down at the papers on my desk, not look him in the eye, and say, "Mr. Bede . . . I'm sorry."

The author also comments, "there is a lot of controversy about the promotion and sales of the BD-5 aircraft. The pilot of this plane does not have many facts or answers to give. The airplane itself, however, ranks among the very best flying machines ever built."

TOPIC 9). TWO OBSERVATIONS:

1) The origins of Scaled Composites started with a Bede-related event. MicroTurbo, engine supplier for the BD-5J jet.

After I left Bede in 1974, my contact for the MicroTurbo jet engine for my BD-5J jet, Herb Iverson, remained a good friend. in ~1975 he had his Long-Island NY-based MicroTurbo company build several BD-5J aircraft, using kit materials from Bede and of course their jet engine. Those airplanes were then used by Gene Soucy, Ed Mauler, Debbie Gary and for their aerobatic airshow team that performed airshows at many cities across America.

Later, in 1977 when RAF needed a shop to build my AD-1 Skew-Wing research aircraft for NASA (chapter 25), I had Herb build it on Long Island. He had no composite structure experience, so I visited his shop several times to teach him the basics of working with foam and fiberglass. The AD-1 made its first flight by NASA at Edwards Air Force Base in December, 1977.

Still later, in 1981 Herb's company built my RAF Next Generation Trainer design for Fairchild Republic (Chapter 27). The NGT made its first flight from the RAF facility in Mojave in September, 1981.

After the NGT program, I realized that it needs to be a separate company that does these types of programs, i.e. projects that are not for homebuilders. So, a decision was made to setup what became the Scaled Composites Corporation (SECTION 4, Chapter 33). I might have founded Scaled Composites without Herb, but it was my Bede experience that later resulted in the initial staffing of Scaled.

2) My Bede experience helped me succeed later.

I think that my initial little company, Rutan Aircraft Factory may not have been successful if it weren't for the fact that I worked for Jim Bede for a couple of years. I was able to avoid the things that he clearly did wrong. The experience taught me the importance of good business ethics and it gave me the courage to move from being a Government worker to everything I achieved after that.

A Video history of BD-5:
https://www.youtube.com/watch?v=iitsZJ1Ija0

TOPIC 10). DETAILED BEDE TIMELINE ITEMS. 1967 TO AUGUST, 1974

1967 First sketches of Bede Micro - Jim Bede with illustrator, Paul Griffin

Nov 70 Construction started on first Micro prototype BD-5 - N500BD. Fiberglass shell construction.

12Sep71 First runway hops, N500BD by Jim Bede at Hutchison airport.

Oct 71 Delmer flies runway hop in N500BD

Oct 71 First all-metal BD-5, N501BD, started construction. Electric retract gear. Kiekhaefer 440cc snowmobile engine, and a variable speed drive system.

Feb72 Burt accepts offer of employment from Jim Bede, 18,000$/year. Approximate date.

1Mar72 Burt arrives for new job at Bede Test Center. Approximate date.

18Mar72 Burt checkout in BD-4 N400BD. His only other flying until 24May was a J-3 Cub and Bede's Yankee.

28Apr72 Dan Cooney arrives at Newton at night. Slept in his Cessna 172.

May 72 Les and Carol Berven arrive to start Les' Job as Chief Test Pilot for Bede Aircraft. Date approx.

May 72 N501BD's Kiekhaefer 440 cc engine was replaced with a 50-hp Hirth 650 cc engine. Approx date.

24May72 At Newton/EWK, Burt flies VariViggen 1st flight. 2nd on 25May. 3rd on 27May. All but a few employees were told that the 2nd flight was the First flight attempt.

28May72 Dan Cooney long dual X-country for Carolyn in Yankee AA-1. A Sunday. Burt flew Dan's C-172 along to see Black Forrest Colorado. Logged 10 flight hours today !

31May72 First taxi and runway liftoff, N501BD. Would not rotate with swept H-tail unless at idle. At Hutchison.

7Jun72 N501BD runway flight with unstable H-tail. Dangerous.

9Jun72 Reading AirShow. Flew BD-4 home 10-11June. RON with Dick and Geri at Dayton Ohio.

16Jun72 More Hutchison taxi tests with N501BD. Still bad Horizontal tail.

23Jun72 Approx date. 1/4 scale BD-5 RC model for spin recovery. Crashed before doing spins.
Lloyd Brekke joins bede test team. Talented fabricator. Stayed until 1977, then moved to Lakeland FL.

8Jul72 N501BD taxi tests with new (and final) horizontal tail. At Hutchison airport.

8Jul72 Carolyn solos Yankee AA-1. Dan Cooney instructor.

11Jul72 The first real flight of a BD-5 N501BD (at Bede Flight Test Center, Newton KS). Engine over-heated, smoke in cockpit, shut engine off to land.

31Jul72 To 5Aug - At Oshkosh to give Bede talks. Log 3.5 hours VV rides and EAA photo flight.

4Aug72 Les Berven and Burt fly in Bede's Baron to Kansas City to negotiate FAA permission to fly the BD-5 in front of the Oshkosh crowds.

5Aug72 N501BD flown to Newton overnight in a leased DC-3 to do a demo for FAA, so it could get FAA permission be flown at Oshkosh. It was wrecked during the demo after an engine failure, then flown back to Oshkosh in the DC-3 that night.

19Aug72 Bede Customer Open house at Newton. Jim had promised a BD-5 flight demo, just 2 weeks earlier at the Oshkosh convention. N501BD flew at Open House.

24Sep72 Fred from Hirth at Newton to help Dan Cooney setup the reliability testing.

29Sep72 Piper Navajo flight - Les giving Cooney dual - with a crowd in the back - ski trip to Aspen CO.

8Oct72 Short wing BD-5A forth flight. Engine failure. Landed on a road, then a ditch. Killed mouse. Failed all 3 landing gear. The last flight of N501BD.

9Oct72 To 4Nov72 - BD-5 propulsion testing on ground.

3Feb73 Checked out Les Berven and Dan Cooney in VariViggen.

26Mar73 First flight of N502BD, the third BD-5. Manual gear retract. Plain flaps. Toothed belt drive system. Hirth 650 cc engine. Later replaced with Xenoah.

5Apr73 Air-to-air photos N502BD for Air Progress. Just a week after N502's first flight.

April 73 Jet version of the BD-5 development started. Project responsibility - Burt.

16May73 Les & Dan Cooney checked out in Jim's DC-3 in Dallas. Flew to Newton next day.

24May73 FAA lifts restrictions on 502BD. It now can fly anywhere outside of Newton, Kansas

24May73 Demo for FAA to remove low-level aerobatic restriction on VariViggen. At Newton.

June 1973 Demonstration of N502BD to Popular Science magazine. https://books.google.co.ukbooksid=5gxIBYlChPwC&pg=PA6&source=gbs_toc&cad=2#v=onepage&q&f=false

10Jun73 First BD-5B Demo at Reading PA Airshow. N502BD

28Jun73 Big show in Calif with DC-3. "No Business like Show Business" sung by PR guy Jack Murphy as the cargo door was flung open.

29Jun73 Burt's 1st checkout — ok to solo Boeing A-76 Stearman at McPherson KS. PT-17 scarf.

20Jul73 First flight of Jet BD-5J. At Newton/EWK. MicroTurbo TRS-18 200 pound thrust. A Burt-designed prototype. 17-ft wing span, fully wet for 50-gallon fuel capacity. Oleo gear struts, main and nosegear.

25Jul73 Stearman biplane. Boeing PT-17. Rides for Carolyn, Fred Ladjimi , Sofee and Herb Iversen.

28Jul73 Until 6Aug73. Oshkosh 73. Bede demos the Jet and the third prop BD-5B, N502BD.
Jet is not restricted to Newton because it is Exhibition, not homebuilt category.
Jet Demo at Oshkosh is just 8 days after first flight.

3Aug73 BD-5J thrust attenuator stuck during airshow. Les hits approach lights, big gashes in wing.
"Lets go to lunch, crashing makes me hungry"

9Aug73 DC-3 took BD-5 to Abbotsford, BC, Canada.

1Sep73 And 2Sep73. Weekend Bede Open House. Flew VV aerobatic demo.
Decided I was not going to do any more low-level aerobatics - too dangerous.
Pilot Log - 700 total flying time, 200 in VariViggen.

15Sep73 Bob Hoover flies the Jet BD-5J at Reno Air Races. The second pilot after Les Berven to fly a BD-5.

20Nov73 Flew VariViggen to Kelso/LongView in SW corner of Washington State to look at a possible post-Bede job at Molt Taylor's shop.

Early Feb74 Bede announces the plan to certify the BD-5 and to produce it, showing huge reductions in price if the volume is huge.

14Feb74 Burt flies first flight of his trainer design, the BD-5T "Truck-a-Plane".

5Mar74 Burt flies his first flight in a 2-stroke-powered airplane, the BD-6.

19Apr74 Burt becomes the second pilot ever to fly a propeller BD-5, the Xenoah-powered N502BD. Burt never flew a Hirth BD-5.
Les Berven flew all the propeller BD-5 flights from 11Jul72 to 19Apr74.
Note: Bob Hoover was actually the second person to fly a BD-5. He flew the Jet BD-5J at the 1973 Reno air race event.

22May74 Burt has engine failure and forced landing in the Hirth-powered BD-6.

26May74 Bede Picnic. Flew VariViggen semi-aerobatic demo. Front seat VariViggen checkout for Jack Cox & Tom Jewett

6Jun74 Paul Poberezny, the EAA president trains in the BD-5T and flies BD-5B, N502BD. Initial touchdown was gear up, followed by a go-around.

6Jun74 Late evening, Paul Poberezny pilots the Bede DC-3 from Newton to

Milwaukee - Low ceiling “EAA-Authority - for IFR”.

7Jun74 Just after midnight, Les and Dan piloting DC-3, Milwaukee to Reading PA, to deliver the BD-5J jet for its airshow. Engine fire right after takeoff, over Lake Michigan. Called Paul. He fixed the fire damage and hand-propped the DC-3.

7Jun74 The Bede Trainer and BD-5J are demonstrated at the Reading airshow.

8Jun74 Burt flies a Cessna 182 from the Reading, PA airshow to Newton Kansas.

15Jun74 Burt flies first flight of the second BD-5T, “Truck-a-Plane”. This was the last time that Burt flew any Bede-type airplane.

28June74 Approx date. Burt quits his job at Bede.

2Jul74 Flew Uncle Pete’s Ercoupe from Compton, around SoCal to find a home for RAF. Visits to: Brown field, Montgomery, Ramona, Corona, Oceanside, Lancaster and Mojave. Selected Mojave for RAF.

29Jul74 To 6Aug74. Burt and Carolyn fly to Oshkosh in VariViggen and fly 10-hours of Oshkosh Demos. Won “Outstanding New Design trophy”.

18Aug74 After the Oshkosh trip, flew VariViggen to Newton KS. Spent 10 days at Valley Center home, to sell it and pack belongings.

28Aug74 Start VariViggen trip to Mojave., along with Dart Station Wagon. Stops at DHT, TCC, Grants, Gallop, Flagstaff and Needles.

31Aug74 VV and Dodge Dart arrive at Mojave to start RAF.

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TOPIC 11). COMMENTS FROM FRIENDS WHO READ AN EARLY CHAPTER 18 DRAFT:

Comments from writer Peter Garrison:

Burt,
I found the Bede chapter entertaining. The story about Carl Kiekhaefer is particularly memorable. But I feel there is an element that you have left out and that would enrich the story considerably.

How did you feel about being part of Bede's house-of-cards Ponzi scheme? You obviously realized almost immediately that he was not being honest with his customers. You obviously believed -- correctly -- that you could fix the airplane's aerodynamic flaws. But did you ever believe the powerplant could be made to work at an aviation level? Did you have misgivings about being part of the whole doomed enterprise? Did you discuss them with Caroline or

with Berven? With your parents? Did you worry that your own career might be harmed by your association with a charlatan like Bede?

The thing is, you keep talking about the Bede period in terms of "fun", and you describe the wide gap between Bede's claims and reality in comic terms, but you never express any discomfort with your own role. How did you feel about it then? How do you feel about it now? How do you feel now about how you felt then?

You do refer to lessons you learned, such as don't price below cost and don't advertise what you are not ready to deliver; but that's the business school aspect of the experience. As far as I know you have always been an honest guy, and so I would suppose that you have to have had some qualms about the Bede operation. Tell us about it. Even if you just say, "It all seemed like fun and games at the time, but in retrospect I realize that it hurt a lot of people, financially and otherwise, and I regret that," it will give a sense of moral perspective to the chapter that it currently lacks.

Thank you for your invitation to visit. For various reasons I am not able to do so, but the loss to you is not great, because my memory for past events is not very good and I doubt there is much I could add to what you already know.
Peter

My answer to Peter Garrison:
You are correct. The current draft does not adequately reflect my concerns about Jim's management and ethics. {I later made corrections} Remember, my Bede job was my first non-government job in engineering/test and I was not sure what was "Normal". As soon as Bede announced the BD-5D (Certified/production model). I decided to leave. It took a while for me to have the courage to try to make a living selling plans to homebuilders (RAF in Mojave).

I went to Bede in 1972, thinking it would be less than a year, then go back to my real career job. Also, I do need to clarify how I felt when Bede decided to do the BD-5D production acft. I made the decision to leave back in March 1974 and quit in July 1974.
Burt
———-

Tanner Ewing and his wife Taylor stopped by Coeur dAlene's KCOE airport in their LongEZ in late August 2021. They spent the night at our cabin and I decided to let him review an early draft of the Bede chapter. Here is his feedback:

On Sep 7, 2021, at 10:14 AM, Tanner Ewing <twing207@gmail.com> wrote:
Burt,

I very much enjoyed reading about your time at Jim Bede's company. Having read other accounts of the BD-5 history it was interesting to learn some of the more hidden details. I was left with a few questions which I think might also help other readers.

1) Early on in meeting Jim Bede you purchased a slot for a BD-5 kit. Your intent was to build it into a MiniViggen canard airplane. At that time, with your aeronautical expertise from the US Air Force career, did you realize that the promise of a 215mph cruise on 32hp would be impossible? Or had you bought into the marketing and assumed that Bede had some

trick up his sleeve to achieve this as many others did?

2) As a business founder I can relate completely to sticking around in a job for 'security' or other reasons and fearing breaking off to start your own business. That is a brave thing to do! I think it would be interesting to know how this felt for you at the time, what that internal struggle was like. It sounds to me like most of the people at the company could see the writing on the wall. How long did you continue to work at Bede once you decided that you wanted to leave? What was making that decision like for you and your family?

3) You mentioned making calculations of the BD-5's drag and determining its real performance would be significantly less than Jim's marketing suggested. You didn't want to confront Jim about this early on (completely understandable after moving your family for a new job), did you ever confront Jim about this? I assume he saw the note on his chalkboard "The Difficult we do in
two weeks; the impossible we advertise" - what was his reaction to this?

4) As time progressed and people started to get angry with Bede, did you ever directly experience any interaction with angry customers? During your time on the front lines in Oshkosh and other shows did you ever witness angry customers? What was that like?

Overall I thought this was very well written and informative and I really appreciate you sharing it with me. This chapter reads as though you are telling the story in person - that is probably a side effect of recorded audio interview style, I think it works really well for this type of long format autobiography. I admire the honest and direct nature of these stories. I look forward to reading more chapters as you have them available.

I'll be very interested to read the details around your Truck-a-Plane and the reunion party that lead to the start of Scaled Composites.

Thanks again for sharing
Tanner Ewing

Burt's answer to Tanner, 7Sep21:

1). I knew the advertised speed was bogus, but realized that if it would go only 160 mph it would still be a fun airplane to own.

2). I decided to quit Bede in April 1974, and my last day was that June. I almost chickened out of doing a startup company. I pressed on, of course, knowing that Edwards Air Force Base was just a 20 minute drive east of Mojave, so if RAF failed, I might have been able to return to my secure Government job with the USAF.

3). I did not have to confront him. I did the best thing: send him the performance data from flight test. The note stayed on the chalkboard for my full 2+ years. I do not recall his comments upon seeing it.

4). I personally saw one very dramatic event with Bede and his customers on the flight line at Oshkosh. I am saving that cool story for BRAB publication.

Reunion party did not lead to Scaled start. Scaled test hangar was just a neat place to have the party to celebrate the 20th anniversary of the BD-5 design. The party was in

Scaled's 5th year.

Thanks for the feedback, it will help me improve what is said in Chapter 18.
Burt

———

Here are comments submitted by Dave Noland, Writer.
I had told Dave that BRAB would include short Biographies of my interesting friends, so his response included more than just his interface with me during the Bede era:

While in the Army,I submitted a free-lance article about my German soaring saga to Air Progress, my favorite aviation magazine. Editor Dick Weeghman liked the story, bought it for $200 and, upon my discharge from the Army, offered me a job as a staff editor. I jumped at the chance and moved to New York City in November, 1971.

This was about the time that BD-5 mania was starting to build. The red fiberglass V-tail prototype had just made its first brief, precarious hop along the runway, and ads for the $1800 BD-5 kits had started to appear in the aviation magazines. Also, just about then, Jim Bede first met a young flight test engineer from Edwards AFB named Burt Rutan.

By July 1972, Burt was working at Bede as Director of Development, and interest in the BD-5 was building to a frenzy. Air Progress sent three staff people to Newton for a big cover story on the airplane, including the first air-to-air photos of prototype 501, which had just made its first flight. Unfortunately, as a mere associate editor, I didn't get to make the trip. But I did end up talking on the phone to Burt, the beginning of a now 50-year journalist/source relationship.

Inspired by Weeghman's reports on 501, I succumbed to BD-5 mania and handed Jim Bede a deposit check for $200 at the 1972 {1973?} Oshkosh Air Show.
I got my first package of kit parts the following April, and set to building in a neighbor's barn.

Meanwhile, the BD-5 was suffering a never-ending plague of engine problems. By the fall of 1973, the prop-driven BD-5 was still not reliable enough for a test flight by a magazine editor. But the jet-powered BD-5J, which first flew in July 1973, had proven reliable, so Weeghman, a former Air Force F-86D pilot, was invited to fly the jet, the first journalist to fly any BD-5. Unfortunately, I again didn't make the cut for the trip. But I drooled over the pictures and Dick's rhapsodic accounts of flying the tiny jet.

I traveled to LA by J-3 Cub, a nine-day, 42-stop epic that I was very glad to have completed. The pieces of my partly-built BD-5—wings, vertical stabilizer, fuselage shell—followed by moving van.

Shortly after I arrived in LA came word from Jim Bede: come to Newton and fly the prop-driven BD-5—the Holy Grail of aviation journalism for the last two years. Finally!

But with Dick Weeghman now gone from Air Progress, Bede had already given the first journalist flight of the prop-driven BD-5 to Jack Olcott of Flying magazine, our main rival. I was pretty pissed to have missed the scoop; Air Progress had given the BD-5 a lot of positive (or at least neutral) coverage, and had established what we thought was a good relationship with Jim and Burt. Flying, which focused mostly on business aircraft, had given

the BD-5 scant and skeptical coverage. But in the confusion of our staff and geographic transition, and with an inexperienced kid (me) now at the helm, we got lost in the shuffle.

Despite my disappointment at not being first, I showed up in Newton with Budd Davisson, Air Prog's go-to pilot-report free-lancer, a veteran sport pilot who'd flown literally dozens of different homebuilts, and had more aerobatic instruction time than I had total time. Also along for the ride was Peter Lert, a young LA pilot/writer I'd managed to steal from Flying. Budd did the main pilot report, while I chimed in with the low-time pilot's perspective. (I had about 400 hours, most of it under 100 mph.) Peter also got a flight, which became worthy of a sidebar account in the magazine when his engine quit. (No problem for the veteran sailplane pilot.)

After I'd completed a number of training runs in Burt's bizarre Truck-a-Plane BD-5 simulator, Les Berven let me into the cockpit of the real thing. (Burt had left Bede by then, but the Truck-A-Plane fortunately stayed.) I was by far the least qualified pilot to have flown the BD-5 up to that time, but thanks in part to the simulator, I had a wonderful flight and made a pretty good landing. The BD-5 handled superbly: very stable, a gentle stall, yet incredibly responsive. I still rate that half-hour flight as the peak of my flying career. And I'm still puzzled by the BD-5's subsequent accident rate, which is exponentially worse than any other airplane in history. It sure flew nice for me.

Back in LA, Lert and I, in addition to getting out the first issues for the new Petersen regime, set our sights on stealing another Flying writer who lived in LA, Peter Garrison. A brilliant guy with an English degree from Harvard, Peter G had designed and built from scratch a long-range 200-mph homebuilt called Melmoth for the purpose of flying himself and his girlfriend Nancy non-stop to Europe. Garrison was a mainstay of the Flying staff, and its expert on homebuilts.

The two Peters and I were of a younger, shaggier generation and mindset than the older suit-wearing types that were the norm in the aviation journalism world in those days. Peter G at first resisted our entreaties to join our staff, but consented to write a couple of articles for us under a pseudonym. But our charm offensive eventually prevailed, and Garrison soon joined the Air Progress staff, much to the chagrin of Flying editor Bob Parke.

It was through Peter G, who had already spent a lot of time with Rutan, that I got to know Burt better. I recall flying in Melmoth from Whiteman Field up to Mojave the first time. Burt had just bought a ramshackle building at the airport, and I remember seeing, hung up in the rafters, a BD-5 fuselage shell with a canard sprouting from the nose. I also remember tearing along Highway 14 in Burt's Dodge Dart "wind tunnel," with a scale model of the Vari-Eze mounted on the roof and a dashboard full of instruments reading out the data from above. As I recall, that "test flight" showed the model to be unstable in the yaw axis. Burt's solution was simple: bigger winglets.

At one point, Burt called to invite Peter G and me to fly up and watch the first flight of the actual airplane, the original VW-powered Vari-Eze. Unfortunately, during a high-speed taxi test, the nose wheel shimmied badly and the fiberglass nose gear leg snapped. The plane flopped down on its nose at 60 mph and scraped along the runway, eventually coming to a safe controlled stop. It was now after 4 p.m., so Peter and I flew back to LA disappointed, but prepared to return once the damage was fixed and the plane ready to fly again.

It was not the first time we were to underestimate Burt. The VariEze was repaired in an hour

and made its first flight later that same evening. We had missed what could be considered a historic event: the first flight of the plane that kick-started the Rutan legacy.

The two Peters and I had a fun year or so at Air Progress. In addition to flying the BD-5, I got to spend a weekend on a Navy aircraft carrier, and live out (in a 727 simulator) my fantasy of taking over the controls of an airliner after the pilots had been incapacitated. (For the record, I managed to get the "plane" safely the ground, saving the lives of 188 theoretical fellow passengers in the process.)

Lert got to fly an actual F-14, and ride in a B-52. Garrison, finally under his own by-line, wrote the first major article on the Vari-Eze, a cover story in the September 1975 issue. Normally a hard-nosed skeptic about such things, he concluded, "The Vari-Eze promises to surpass everything we have seen to date; if its promise is borne out, it will be, in its modest way, a milestone in aeronautical history."

But the fun came to an end shortly after I received a story from writer Keith Connes about a worrisome trend then confronting general aviation: product liability lawsuits. The article highlighted the legal case that had just rocked the industry, a $17 million jury verdict against Beech Aircraft over a Baron crash caused by fuel un-porting after a turning take-off.

It was an excellent article on an important topic, and I was eager to run it. But our publisher, a TWA pilot named Tom Guthrie, read the manuscript and vetoed it. We would not publish an article that makes one of our biggest advertisers look bad, he declared. (As I recall, he said Beech's ad buys that year totaled about $50,000.)

This was a gross violation of basic journalistic ethics, and I immediately resigned as editor. (Ironically, the editor hired to replace me was Keith Connes.) I subsequently moved back to New York and wrote a few free-lance pieces for Connes. Lert stayed on for a while as a contributing editor, and later went on to have a varied and fascinating flying career that included a stint as a test pilot for Burt. (I look forward to reading his account of those days.) Peter Garrison skedaddled back to Flying, where he continues his 50+year run as that magazine's best writer.

Back in New York, with Bede's bankruptcy imminent, I sold my unfinished BD-5 kit for a paltry $1500. Unfortunately, around that same time my J-3 Cub was destroyed in a windstorm. Although now plane-less, in 1976 I finally found my journalistic niche: Aviation Consumer, a fledgling pilot's newsletter that took no advertising and promised readers to tell it like it was. (As I recall, a subscription was $39 a year, compared to maybe $5 a year for the typical advertiser-supported magazines. Pilots, it turned out, were willing to pay good money for hard truths about their planes.) The editor was a crusty old guy named Jim Holahan. He hired me, now an Untouchable in mainstream aviation magazine circles, as an associate editor. One of my first articles was a roundup of homebuilts, and prominent among them was the Vari-Eze.

Shortly after I joined AC, it was sold to Belvoir Publications. Holahan decided it was time to retire, so Belvoir publisher Robert Englander offered me the job as editor. But I'd learned my lesson: it's more fun to be the writer out flying the F-14 than the editor back in the office assigning the writer the story and then shepherding it through to publication. Plus, I didn't want the burden of responsibility for getting the issue out every month. I just wanted to fly and write.

I'd stayed in touch with Dick Weeghman, who, after leaving Air Progress, had been hired as a staff editor at Flying. But after his fun, creative years as the boss at Air Progress, Dick wasn't particularly happy as one of the crowd at a more staid, business-oriented mag. At my urging, he bravely made the jump from the biggest, most established pilot's magazine to an upstart newsletter whose purpose was to shake up the establishment.

It was a great move. For the next decade, Dick and I, along with Brent Silver, Dave Shugarts, and Kas Thomas, regularly shook up the light-plane establishment. Our biggest shocker was an exhaustive piece by Brent Silver documenting the hundreds of in-flight structural failures of the V-tail Bonanza. The article caused V-tail sales to plummet, and one of the most beloved, prestigious private planes ever was discontinued not long after the article appeared.

We also did safety exposes on the Piper Cheyenne, Cessna P210, Mitsubishi MU-2, Cessna Conquest, and Aerostar, among many others, as well as pitiless reports on various maintenance disasters like spalling Lycoming O-320-H valve tappets, cracking Continental IO-520 crankcases, and endlessly malfunctioning Cessna ARC radios.

Along the way, AC covered all of Burt's wild and crazy projects, contrasting them with the boring business-as-usual approach of the established light-plane companies. After Beech secretly hired Burt to design and build the proof-of-concept prototype of the Starship, we had a chance to scoop the world. In September, 1983, I happened to be in LA , and Burt had just dropped a hint to Peter Garrison, still a friend of mine, that he might see something interesting if he showed up early at Mojave the next morning. We showed up in Melmoth—just like old times—and there it was: the Starship prototype, rolled out into public view for the first time.

The deadline for Aviation Consumer's next issue had passed a couple of days previously. I called Englander and pleaded for a "stop-the-presses" moment to get the story into print, explaining that the Starship photos I had snapped were probably the biggest aviation news of the year. But he refused; it would have cost a few hundred dollars extra. As a result, our Starship coverage appeared weeks later, along with everybody else's, after Beech issued a press release. I'm still pissed.

Our coverage of the VariEze and its successor, the Long-EZ, was a bit more critical than the usual upbeat aviation press coverage. A 1985 Aviation Consumer article called "The Safety Record of the Rutan Canards," for the first time calculated an accident rate for the two aircraft, and it turned out to be a lot worse than comparable two-seat fixed-gear production aircraft. I don't recall Burt complaining about the tough coverage, and Mike Melville even conceded that we'd told some "home truths." In another more upbeat article, Brent Silver, who'd worked as a volunteer for the Voyager mission, wrote a superbly detailed insider's account of that epic round-the-world flight.

By the mid-1980s, the light-plane industry was in a near death-spiral, and there was hardly any interesting new stuff to write about. After climbing Mt.Kilimanjaro in Africa, I developed a taste for adventure travel. In 1987 I left Aviation Consumer and started writing free-lance for Outside, National Geographic Adventure, and the New York Times travel section, among other travel publications. With AC's Mooney 201 no longer at my disposal, I suddenly confronted, for the first time in my life, the horrifying cost of renting a plane in the real world. On a free-lancer's meager income, paying to fly enough to stay safely current was out of the question. Add in a new wife who hated flying, and sadly, my piloting days were over.

Dave Noland

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Another letter from a friend:
BURT, Here are my memories of Newton! I graduated USNTPS Class 65 in May 74, our class took a west coast tour of factories and Edwards etc under the leadership of Tex Birdwell.

I was assigned then to FQ&P Flying Qualities and Performance branch of the Test Center at Pax River. My boss handed me a set of orders to Beechcraft in Wichita to conduct the initial spin trials of the YT-34C....off I went with a good Aero Engineer for 3 weeks of test flying out of the Beech factory ....working with their test pilot Bob Stone.
At the same time two other test pilots were assigned from Pax to conduct engine out testing etc. We used Newton extensively as our center of operations to stay out of the Wichita area.

One day I finished my test card and noticed a strange looking machine called the VariViggen. I rolled in on it but could never pull a lead due to its maneuverability!! We learned that BEDE was at Newton with the BEDE 5 project....so next day we landed and learned a lot about the program to include the bent wing BEDE5 J sitting in the corner of the hangar. Being newly forged test pilots we looked at it and said: "hey, that must be what permanent deformation looks like? Right?" We got a tour of the test bird sitting outside with the Hirth and pusher propeller and learned of all the issues with the whipping shaft and that it was not working out too well....We learned that the canopy had popped open on Bishop and he over G'd the aircraft and we saw the truck with the simulator on the front end...and all three of us Navy guys got a ride in the simulator. Maybe it was young Burt that toured us around...dunno...but sure was interesting interlude to the spin testing of the Turbo Mentor!!

Kent Ewing
Captain, USN, Ret
Former C.O. USS America during Desert Storm…the last war we won.
Vietnam 200 A4 Missions
Golden Eagle
SETP Fellow
GOLDEN EAGLE
FAA PPE for the Eclipse 500
VP Bonanza/Baron Pilot Training, Inc
Eclipse Jet PPE
ATP, CFII

Burt, What a coincidence that there is another EWING in this mix. Maybe some day Tanner and Kent Ewing might meet up.

I am honored to have my story of Navy Test Pilot's visiting Newton in June/July 1974...likely after your departure to start up RAF. The story is exactly true about our visit and getting to fly the truck simulator. Later you told me more about the Bishop canopy issue knocking him out and the chase pilot getting him back to consciousness to land the permanently deformed BD 5J we saw in the hangar.

Your history of Bede and his marketing "vision" reminds me much of Vern Raburn and my experience as his chief pilot at Eclipse Aerospace 2007-2008. Bede and Raburn were BOTH Visionaries...the likes of which aviation requires, however I am flying regularly in the Eclipse 500 VLJ and I sold my incomplete BD 5 kit years ago to an engineer at Gulfstream in Savannah.

A fabulous page turner of history of your time with Jim Bede....so glad you brought testing professionalism to the project....saved plenty of lives of those folks in the airshow industry by presenting a stable machine!!

Kent Ewing
———————

End of Chapter 18