Photo by Jack Cox

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John Roncz
The Aristotle of Airfoils

By Jack Cox

John Roncz is a name that has burst upon the aviation scene like a streaking comet in a clear night sky . . . but like one of those spectacular cruisers of the cosmos, what we see is really only a tantalizing hint of deeper, more intriguing mysteries that remain unseen . . . and unimagined.

Most know that John Roncz is a designer of airfoils, that he has worked closely with Burt Rutan on such state-of-the-art stretching aircraft designs as the Beech Starship and the 'round the world Voyager, and that he is one of the new stars of the forums program at Oshkosh . . . but beyond those impressive credentials, just who **is** John Roncz? Where did he come from and how did he get to his current lofty perch as one of . . . some think **the** world's foremost authority on airfoil design? *How did he do it as a private individual*, without affiliation with a university or a government funded research facility?

For those who **do** know him well and have been exposed to his zany side, the question is not **who** but, rather, **what** is a John Roncz?

Like most complex personalities, the answer depends on **which** John Roncz you're inquiring about, or are encountering at the time. If you are the local census taker, you are only interested in the John Roncz, age 37, who lives at 1510 East Colfax Ave., South Bend, Indiana 46617, who is self employed and whose household contains 2 bathrooms and five (!) computers. For the rest of us, however, it is of great interest to know of the John Roncz who . . .

● At the tender age of five had already mastered the violin to the extent that he was performing concerts and playing with the local symphony orchestra . . . and was considered such a prodigy that he was being personally tutored by the chairman of the Department of Music at Notre Dame University.

● The John Roncz who at age 10 switched to the piano and in six months had won a state medal, who composed the graduation march for his 8th grade class and who was soon entering national and international piano competitions.

● The John Roncz who attended a special high school for intellectually gifted persons on the campus of Notre Dame University . . . who found he had a "funny talent for languages" and soon was fluent in eight modern and ancient tongues, some of which he taught himself. (He was taught Hebrew **in French!**)

● The rascal who once made 50 gallons of rye whiskey in his school's physics lab. Fortunately, it was so bad no one could drink it.

● The John Roncz who breezed through Notre Dame studying subjects ranging from languages to particle physics, ultimately earning a degree in Arts and Letters.

● The John Roncz who, finding the job market in the South Bend/Elkhart area remarkably bereft of opportunities for particle physicists and/or translators of Egyptian hieroglyphics, was forced to take up carpentry in local mobile home/RV plants. 1971 was a recession year for that industry, so after several layoffs, John finally resorted to supporting himself . . . for 9 months . . . selling paintings he had done (after the styles of Marc Chagall and Miro) through art galleries. He also picked up a few commissions to do large paintings in the homes of wealthy patrons.

● The John Roncz who finally went to work in his father's metal stamping company, learning to engineer specialized metal parts . . . and finding he had a talent for the task. He came to consider himself fortunate not to have had formal engineering training because without the doctrinaire approach to problem solving many schools teach ("brain damage", as John terms it), his imagination was left free to seek unconventional solutions to conventional problems. He later built his own company, Gemini Technologies, Inc., around this free spirited approach. Designing new parts and redesigning old ones that were simpler and less expensive than those of his competition, he made money in a unique way: he provided the design work at no charge but would not reveal what kind of metal he had used, so the customer would have to buy the steel from him!

And that's how John got into aviation.

The metals he utilized to make parts were usually specialized alloys which required an unusually high level of quality control in their manufacture - so much that John would not accept delivery without traveling to the steel mill to personally inspect each shipment. As his business grew, he found himself on the road more and more . . . until one week he spent 5 out of 5 days in a car pounding the pavement between South Bend and Detroit! He decided then and there that he **had** to have an airplane.

John had always had an interest . . . a fascination, actually . . . with flying. His father had been a bombardier in World War II which may or may not have had an influence, but, at any rate, from a very early age, John begged to be driven to local airports where he would sit for hours absolutely enthralled by airplanes taking off and landing. In between his violin and piano lessons, he grew up building models — flying models of the stick and tissue variety — and eventually learned about and joined EAA. He began taking flying lessons during the summer while he was still in school — financed by meager paychecks from minimum wage summer employment. The result was that it took him about 5 years to struggle through, financially, to his Private license. He soloed a Cessna 150 in 1971 and got his ticket in 1975.

After the travel dilemma in his business forced his hand, John bought a used Rockwell 112, got his Commercial license and Instrument rating in it, and went on to earn a multi-engine rating in a Cessna 310. Once committed, he simply couldn't get enough flight time, and soon he was operating his business during the day and flying cargo runs at night for a local FBO. He flew 310s and Navajos . . . but declined the opportunity to fly some much abused Beech 18s.

"I was crazy about flying, but I was at least that cognizant of reality," he says today with the hearty laugh that frequently punctuates his conversation.

John cruised along quite contentedly in this day/night routine for a period of time, but, as often is the case, a couple of seemingly innocent and, at the time, unrelated actions would ultimately come together to dramatically redirect his life and lifestyle.

After joining EAA, John noticed an ad in **Sport Aviation** for the book **Theory of Wing Sections** and promptly ordered a copy. His education at Notre Dame had leaned heavily on math and theory, so the book was right down his alley . . . particularly Chapter 3, the Theory of Wing Sections of Finite Thickness in which the conformal transformation of a circle into a wing section was detailed. He mastered the concept using a hand calculator, but found the process so tedious that for a time he did little with it.

Sometime later, he came across another ad, this one for Heathkit's H-8 computer. For just $300.00 you could build your own personal computer and harness the awesome computational power of 24K, it promised. Although he had no idea at all what he would do with it, John found the thought of building his own number cruncher fascinating, so he bought one.

John still vividly recalls that magic moment . . . at about 5:00 a.m. one morning, after an all-night struggle with wires and electrical components . . . when the LED readout suddenly glowed with the message "Your H-8 is up and running!"

Now, in those early days of personal computers the term "user friendly" " was yet to come into vogue . . . so John was faced with the task of teaching himself some programming language. To his pleasant surprise, he found the language of computers as easy . . . for him . . . to master as foreign languages had been in college.

Having grasped the fundamentals of programing, he began casting about for something interesting to encode . . . and suddenly remembered the circle transformation thing from **Theory of Wing Sections**. The very first code he wrote was an airfoil program — and it soaked up almost all that awesome 24K!

For John personally and the world of aerodynamics in general, the meshing of that airfoil theory and the home computer was an event as momentous as the alignment of every planet, moon and astroid in the solar system would have been to astrologers of old. Putting the computional power of that Heathkit computer, as miniscule as its 24K is today, into the hands of a bonafide genius like John Roncz was like handing a crazed killer a burp gun and a case of ammo. Overnight, he began a wild rampage on airfoil transformation, boundary layer flow and every other aerodynamic abstraction that can be expressed mathematically he could lay hands and mind on. Just like the generation of kids . . . and adults . . . who became computer game junkies and hopeless hackers, John became absolutely obsessed by his new toy; but instead of sitting for hours on end zapping alien space ships, he spent his time visualizing how molecules of air flow around an airfoil and learning how to express that movement in numbers . . . numbers that could be manipulated at will in a computer.

Another star crossing that would have a profound effect on John's life . . . and on aviation . . . was when he had a chance meeting with Dr. Jerry Gregorek of Ohio State University. A renowned aerodynamicist, Dr. Gregorek was amazed to encounter a "layman" so well versed in his field and, particularly, in the use of the computer. John, in turn, was overjoyed to meet someone with answers to the growing list of questions his self-taught airfoil knowledge was generating. The two hit it off immediately, and Jerry ultimately agreed to work with John to fill in the missing parts of his aerodynamic education . . . largely by pointing him to the best sources. John possesses the gifts of both natural speedreading and near total recall, so he would devour a book, work out all the problems, then check back with Jerry to ask about anything he didn't understand. John says that Jerry has a true genius for explaining things.

After a time, this "out patient" tutoring process began to change direction. Voracious reader that he is, John soon polished off about every source of information that pertained to his interest area and as he began to ascend from the "knowns" to pure theory, he began to question various things . . . and come up with theories of his own. To Dr. Gregorek's everlasting credit, he did not put John down when he came up with some off-the-wall idea.

Instead, he would patiently explore the idea, pointing out and explaining obvious errors and, just as importantly, would maintain an open mind to ideas of John's that went beyond current theory and practice. He didn't always agree with John, but, ever the great teacher, he couched his disagreement in positive rather than negative terms and encouraged him to seek new sources of information or try a different tack in his quest for a solution to some problem.

Others who were sought out and provided invaluable assistance in John's search for the aerodynamicist's holy grail were laminar flow wizard Bruce Carmichael and Tod Hodges of NASA Langley. Both fed him enormous amounts of material, which he soaked up like a dry sponge and used to flesh out the airfoil theory that was slowly coming together in his mind.

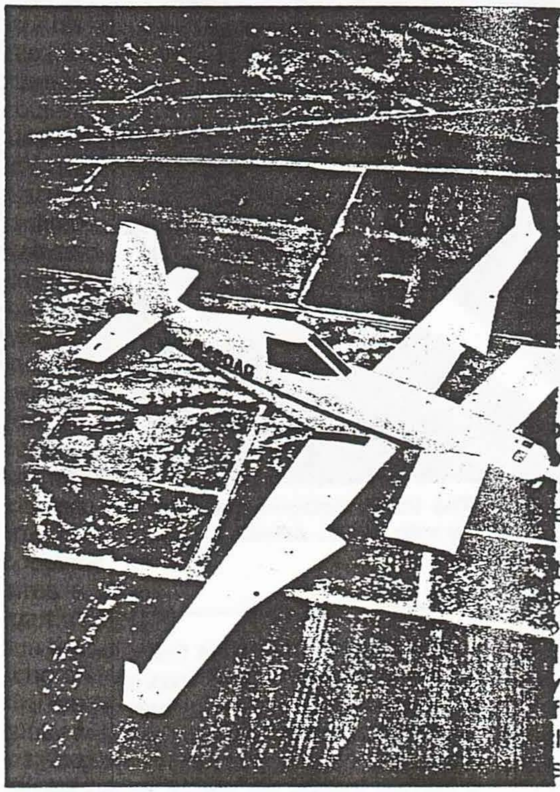
All the while, back home in South Bend, John's little Heathkit computer was also undergoing a metamorphosis. Named "Hal" after the computer in the movie **2001**, it very quickly became inadequate for John's needs. At the time, he could not afford a more expensive, store bought computer, so, instead, he bought a book at Radio Shack on digital electronic theory, devoured it, and began building and installing new circuit boards to add to Hal's circuitry. 2 years later, it bore little resemblance to the kit that emerged from the Heathkit box. John's low Reynolds number theory was developed on the transmogrified Hal, as were the airfoils for the Rutan Solitaire and the Voyager . . . so, however humble its beginnings, it has earned its place in aviation history.

The next significant bend in the road for John came after he ordered a set of VariEze plans . . . he was already a distant admirer of Burt Rutan's highly original thinking. Out of curiosity, he punched the coordinates of the Glasgow University (GU) airfoil used in the VariEze's canard into ol' Hal . . . and found he couldn't make the thing "fly" with turbulent flow. According to his computer program for analyzing the behavior of airfoils, which was pretty sophisticated by this time, the turbulent GU was stalled **at all angles of attack!**

"What is **this!**", John shrieked. "What am I doing wrong?" He knew that about 100 VariEzes were flying at the time with the airfoil — so **something** was obviously haywire. As John explains the phenomenon today, the GU flies, obviously, but it does so in an odd way. If you tuft the tripped canard and go out and fly, the little snippets of yarn will be standing straight up, forward, sideways — any direction except in trail the way they should be — **from lift off to touch down!** The airfoil is actually producing lift with about 50% flow separation. John has concluded that it produces this lift by means of what he terms a "wake body effect", which is, in part, a function of the airfoil's shape and in the VariEze application, its small chord. (Parenthetically, he adds that in the case of the Rutan designs, a slotted elevator is used that ameliorates the condition to a degree. This is why the Ezes have been less subject to loss of lift in rain than Quickies and Q2s which use the same GU airfoil without a slotted elevator.)

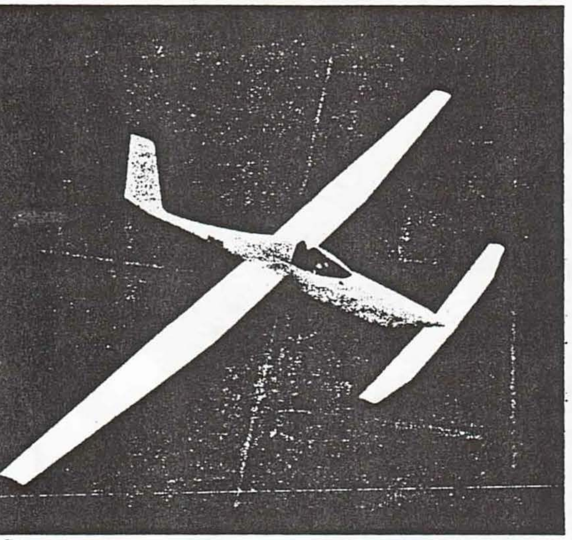
At the time, however, John was totally astounded with what his computer told him. How could this be? What could be causing it? True to form, he instantly launched himself into a crash program to find the answers. Right from the beginning, he sensed that the truth and the light lay hidden from view in that foggy bottom that is the lair of the low Reynolds number. Historically, all the big research bucks have been spent on investigation of the effects of Reynolds numbers of about three million and above, and the modelers have done a lot of commendable work below a hundred thousand . . . but in between, where the Eze canards lie, little effort has been brought to bear. So, it was into that uncharted swamp that John manfully marched, armed only with his trusty Hal . . . and an imagination that knew no bounds.

It would be far easier to relate and explain what John spent the next couple of years or so accomplishing if his effort had resulted in some pat formulas or new physical laws that could be verbalized in a trite phrase or two. Unfortunately, it was not that simple. What John did, essentially, was to sit in front of his computer creating endless numbers of airfoils, and endless permutations of each of those airfoils . . . not **drawings** of airfoils but, rather, rows of numbers that represented pressure distribution and boundary layer development over the entire chords of the airfoils. Eventually, John began to "see" in these numbers all sorts of nuances that told him how that section would behave on an airplane at various angles of attack and with varying roughness. Today, he "reads" his rows of numbers with the same facility he does Greek or the various computer languages he has mastered . . . often to the complete frustration of observers who cannot possibly fathom what he is getting so excited about as he scans his columns of aeronautical hieroglyphics.



The Predator . . . Airfoils by Roncz.
Photo by Pat Storch

Each day and with each airfoil he analyzed, John inched up another notch on a learning curve that no one else has climbed. There are scientists the world over involved in airfoil research, but none that have used John's specific methods and particular approach. The process has involved analytic brilliance on his part, certainly, but it has also involved what to the rest of us would be unspeakable drudgery. He thinks nothing of working straight through the night, catching a few Zs the next morning, then going right back at it for another 18 to 24 hour, straight through number crunching orgy. (No, if you are wondering, he is not married.)



The Rutan Solitaire, the third aircraft to fly with Roncz airfoils.

Photo by Pat Storch

The result of all this is that John has achieved a level of both theoretical and practical accomplishment never before achieved . . . and he has done it in an amazingly short time in terms of **years**. If he had logged his **hours** on the job, however, they likely would already equal the working life of the average 8:00 to 5:00 aeronautical researcher.

And, now, the most incredible thing of all — to this point, all this education, all this gut wrenching effort was strictly a **hobby** with John! Being self-employed and having employees who could keep things humming while he was on one of his round-the-clock airfoil analysis binges, he was in a unique position to indulge himself in what was for him an all-consuming passion.

But we're getting ahead of the story. While John was making his periodic visits to Ohio State to confer with Dr. Gregorek, he became interested in their metal wind tunnel models . . . but he didn't like the way they were being made. Based on his metals business experience, he could see that much could be done to improve manufacturing methods, so he went back home, conceived a new way of making models, designed a special computer driven milling machine . . . and wrote a very complex computer program to operate it. Today, Gemini Technologies supplies almost all of Ohio State's wind tunnel models and orders are now coming in from industry and several of the NASA Laboratories.

Then came the Rutan connection. It began when John read an item in the **Canard Pusher** newsletter about a new canard airfoil Dick Rutan had tried out on his Long-EZ. Anxious to analyze any low Reynolds number airfoil that had actually been flown, he wrote Dick to ask for the coordinates. Since he was unknown to the Rutans at the time, John included some pressure distribution plots and other information derived from his analysis of the GU airfoil to show what he wanted to do with Dick's new airfoil. A few days later, John got a call from Burt Rutan!

In still another of those fortuitous path crossings that seem to have blessed John throughout his aviation experience, it just so happened that Burt was looking for someone to evaluate some low Reynolds number airfoils for what was then his latest project, the Solitaire. John readily agreed . . . but when he ran them through his computer, he found they were lacking in the performance Burt needed for the radical powered sailplane he envisioned. John sent Burt a detailed analysis of the airfoils, plus one of his own design his computer said would be better suited to Burt's needs. Included was a tape recording that talked Burt through all the charts, diagrams, boundary layer profiles and John's analysis of the physics involved. He was hoping to impress Burt and apparently he did . . . but only after Burt had put John's airfoil to the acid test.

Johnny Murphy had completed the first plans built Long-EZ by this time and was encountering some really bad pitch down problems in Florida's torrential rains. This was partially due to some construction irregularities in the canard, but since some other builders were also experiencing pitch changes, the GU airfoil was definitely suspect. Unbeknownst to John, Burt whipped up some drawings for a new canard utilizing John's airfoil (with a slotted elevator) and mailed it to Johnny. To everyone's astonishment, the new canard not only allowed Johnny to fly hands off in rain . . . where formerly he was diving with full aft stick . . . but also lowered his rotation speed by 10 knots and even increased his cruise a bit! While everyone recognized this was, in part, an indication of how bad Johnny's original canard was, still it was an unquestionable fact that John's airfoil was the best one by far Burt had yet encountered.

So, Johnny Murphy's Long-EZ was the first aircraft to fly with a Roncz airfoil. The second was Mike Melvill's Long-EZ. Mike was looking for some more speed for the CAFE race and John, knowing the use of one of his airfoils without a slotted elevator would be a worst case situation and thus the best test of his low Reynolds number theories, was looking for another test bed, so he designed a new airfoil tailored specifically for Mike's EZ. Included was "the most detailed set of plans ever drawn", according to John — 60 pages of building instructions just for a canard! He also included upturned canard tips to direct the canard vortex up a little higher on the aft wing to lower drag and increase maximum lift. This was something he had already designed and had seen flown on a local EAAer's airplane, Jerry Gruber's Long-EZ.

The Solitaire, the third application of Roncz airfoils, was quite a project and served to both cement the Rutan/Roncz working relationship and to establish John as a world class designer of airfoils and an authority on low Reynolds number research **and application**. The problem was that the skinny little Solitaire wings were operating in what John characterizes as a "ridiculous Reynolds number range — 300,000 with lift coefficients greater than 2." Although it has not been a great commercial success, the Solitaire was an engineering *tour de force* for both Burt and John . . . with far reaching effects for a far broader spectrum of aviation than just the homebuilt market.

By this time Burt and his associates had formed SCALED Composites, a private "skunk works" that took on commissions from industry. Soon, John's expertise was being put to work there . . . but because of the veil of secrecy that naturally must be drawn around projects companies are paying dearly for in an effort to get a leg up on their competition, there is little we are at liberty to talk about on John's (and Burt's) work after the Solitaire . . . except, of course, for the Voyager. This is without question the single purpose airplane to end them all. Every aspect of its design — the structure and the aerodynamics — was optimized to do one thing: fly around the world non-stop on the tank(s) of gas it takes off with. The fact that the world flight has never been done and that the Voyager appears capable of finally doing it is testimony enough to Burt's genius as an airplane designer, but in order for his ideas to work, he had to have some airfoils, the likes of which the world had never seen. The canard had to have an L/D of around 200 and the main wing about

134 . . . and both had to somehow avoid the deleterious effects of bugs, rain and even ice for 10 days and through 25,000 miles of the earth's far from pristine atmosphere. It was John's job to supply Burt with such "miracle" airfoils and to figure how they interacted, from canard to aft wing.

What John came up with was an airfoil shape that controls **where** the inevitable bugs will hit the wing surface . . . one that **aerodynamically** deflects them so they hit near the stagnation line on the upper surface, leaving the lower surface essentially free of strikes. The proof of the effectiveness of his work came when the Voyager landed at Oshkosh last summer. It had flown 21 hours and through a number of take-offs and landings since last being washed, yet the whole bottom of the enormous wing (and canard) was clean as a whistle. John estimates that no more than a half a percent of laminar flow is lost on the lower surface on a long flight like that, but about 50% is lost on the top surface.

This is not a problem, however, because that margin was designed into the airplane. John is justifiably proud of his role in the Voyager design and says, "I have a feeling that we will be able to rewrite certain chapters on boundary layer stability shortly." He also says the project was really tough ". . . because we were really pushing performance to the hilt."

John is also high in his praise and respect for Burt. Despite the fact that the Voyager was such a far out design, its take-off speed, for instance, was within one mph of Burt's estimate.

"It's amazing how Burt can do that," John says. "He is the greatest mind in the world on airplanes. How he can nail things down that close just amazes me. A lot of the reason why what I do (on airfoils) is successful is because Burt knows precisely what he needs. Most designers have no concept of what they need (for airfoils). He knows what makes the design tick, and he will tell me he needs a lot of lift here and he doesn't care about something there. He has a real feel for what is going to make the configuration work. I now have a real feel for how to get what he wants . . . so, between the two of us, we are a pretty dynamite team."

The next project John worked on . . . and keep in mind, all this in a volunteer role to this point . . . was the microlight SCALED contracted to design for the late Colin Chapman. It would come to employ John's favorite of all the airfoils he has designed . . . one that Burt used to have a drawing of on his office wall.

As John recalls the design sequence, "This was an airplane in which Burt had to guarantee a low rotation speed. He kept telling me 'I need gobs of lift, **gobs** of lift!' So, I finally worked out this banana shaped airfoil, employing a preposterous design procedure . . . but one that paid off. It's too complicated to describe, but I came up with another way to design an airfoil and made this funny bent banana shape, then straightened it out. I sent it out to Burt with the designation 'GOLA'. He wanted to know what that meant and I said, 'Gobs of Lift Airfoil — that's the only design parameter I ever got from you!'

"But 'GOLA' worked. Man, that thing would go down the runway with full aft stick and not one little tuft ever raised its head - it had attached flow all the time. It **did** have gobs of lift. The back wing looked like a tadpole because it had a thick spar and there was a need to minimize the foam volume to keep the weight down. It was extremely important in that airplane for me to consider functional as well as aerodynamic needs as I was designing the airfoils. Historically, most airfoils have been designed to decorate text books, but mine are tailored for a specific airplane with a specific set of airframe design and performance goals. I have to consider the fact that the wing has to have a spar, has to blend into the fuselage, etc. We build airplanes, not just airfoil shapes. They have to be structurally acceptable.

"If I am going to claim anything in the world, it's going to be the concept of optmized wing design, tailoring the airfoils to fit the **total** airplane.

"The microlight was a great little airplane. It's a shame nothing came of it after Chapman died."

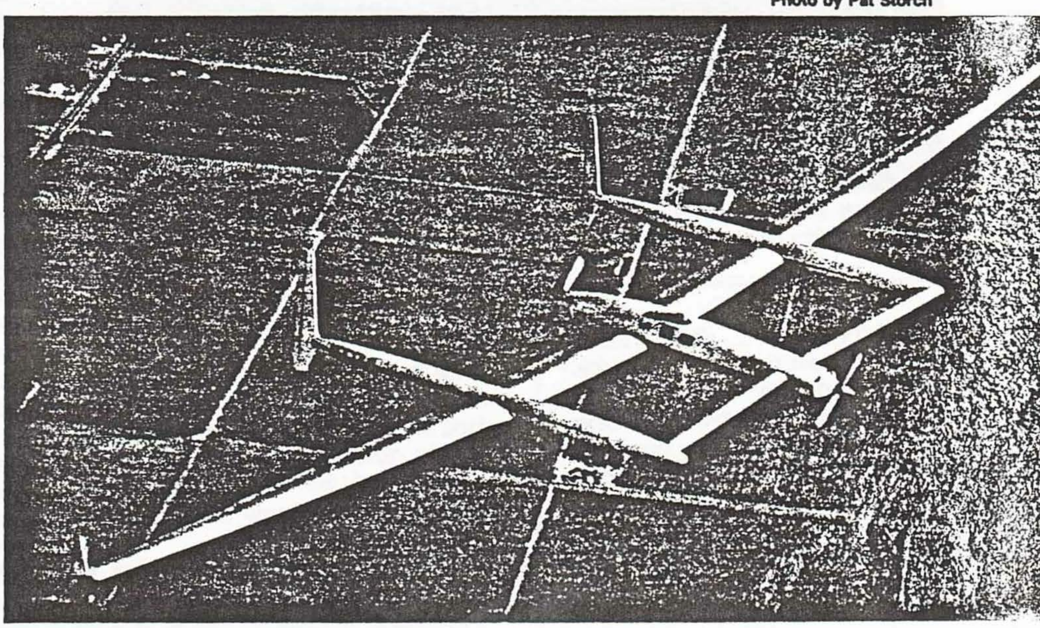
The rest **is** pretty much under wraps . . . but it involves the Beech Starship. John designed the airfoils to meet Burt's performance and structural criteria and they were met . . . in spades . . . when the scaled down flight test article built by SCALED Composites flew. He can only drop a few tantalizing clues as to what the corporate world can expect when the airplane hits the market. John believes it employs the most complex wing ever designed, one that would be impossible to build in anything other than composites. It contains 5 different airfoils, spanwise, that blend together. Special purpose airfoils were also designed for the tipsails and the ventral fin . . . and the swinging canard contains a Roncz airfoil which, during wind tunnel testing at Ohio State, recorded the highest lift ever produced there at its Reynolds number.

The Starship, John firmly believes, is a major milestone in aviation history — one that will forever alter the future direction of aircraft design. He is extremely proud of having had a role in its creation. Actually, he is still involved with it. After making the decision to produce the Starship, Beech signed John to an exclusive personal service contract . . . and sold him a Duchess to use to commute to the factory in Wichita.

"They own me, body and soul," he jokes today . . . and proceeds to relate still another unusual circumstance of his aviation career. Jim Terry, the official he works for at Beech, is the designer of the Rockwell 112 and the Beech Duchess . . . the two airplanes John has

About the Voyager, John says, "I have a feeling that we will be able to rewrite certain chapters on boundary layer stability shortly."

Photo by Pat Storch

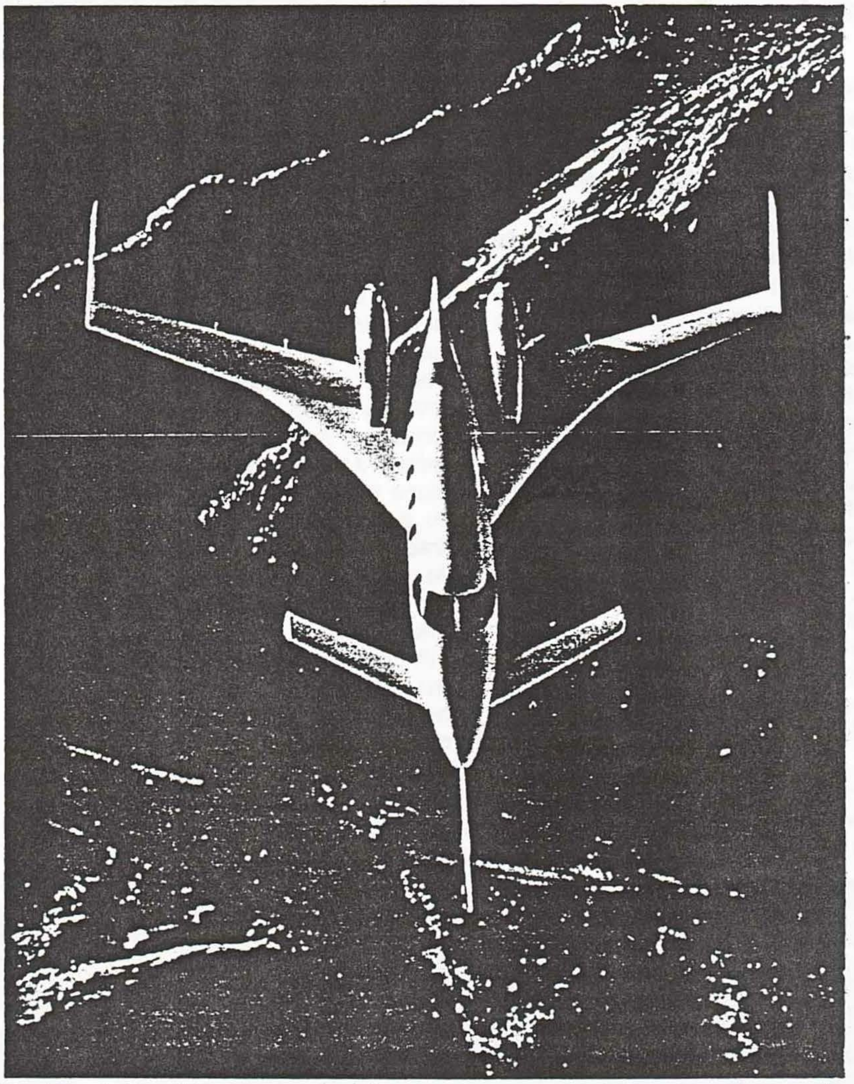


owned. Needless to say, they have a lot in common.

His most recent project for Beech — one that is continuing at present — is the application of his airfoil theories to the design of propellers. The Starship will take the propeller past the limits it has previously gone, so some radical new thinking was required to design one to realize the full potential of the airplane. Radical? Where's Roncz?

In between all these exotic airfoil design projects . . . and before he began being paid for them . . . John was still acting as his own computer manufacturer. Hal's capability was quickly exceeded, as already noted, and since John couldn't spare the five grand the early 64K store bought computers cost, he decided to design and build one from scratch. It wasn't a pretty sight — just a tangle of wires, circuit boards, disc drives and such strung along a big piece of 3/4" particle board, and it took 5 months of highly frustrating effort to get it to work, but work it eventually did. Named Hal II, naturally, it did some extremely significant work for aviation.

Then, after getting involved with Burt Rutan, John built Hal III, a computer compatible with Burt's Apple II, so they could exchange software. John, incidentally, never entertained the thought of leaving South Bend to move to Mojave to work in SCALED's offices. He would never, he says, consider living in a city with less than **two** symphony orchestras!



The Beech Starship . . . an aircraft John Roncz believes will forever alter the future direction of aircraft design.

Photo Courtesy Beech Aircraft Corp.

Now in a position to purchase commercial hardware, John recently acquired an IBM AT computer. He still has the Hals, however, and still uses them. It would simply be too time consuming to transfer the programs written specifically for them to the IBM.

One of the most recent projects in which he has collaborated with Burt is the Predator, a large ag plane. It also has a very complex canard/wing system employing nine(!) airfoils in order to obtain optimum performance.

Largely as a result of the notoriety he has received as a result of the Starship and the Voyager, John is now in demand on the university and EAA Chapter lecture circuit. Anyone coming in cold to a Roncz "performance" is in for a shock. The only thing John loves as much as playing Chopin and designing airfoils is stand-up comedy. His lectures are a riot! He has an absolutely outrageous sense of humor and as far as I know is matched only by EAA's Norm Petersen as a connoisseur of outlandish jokes and even worse puns.

Last summer at Oshkosh, his forum on the design of canard aircraft was a scripted comedy routine from start to finish, complete with an introduction by Nick D'Apuzzo that ran something like this: A Polish scientist named Dr. Gregorek, working in his lab in Transylvania, was trying to assemble a trash compactor kit when it short circuited in a blinding flash and a resulting cloud of orange smoke. When the smoke cleared, there stood his creation — a bizarre Hungarian named John Roncz. For this crime, Dr. Gregorek was banished to a penal colony called Ohio . . . and John was sold to a band of gypsies . . . who, in turn, sold him to then Beech president Linden Blue. It had the audience rolling in the aisles . . . but at the same time was a very clever way of presenting a highly technical subject. All the serious stuff was there, but it certainly was a fun way to take the medicine. You're likely to find standing room only at John's performances, but don't ever miss one!

When EAA was founded 32 years ago, it was hoped that the little group might someday help push back the frontiers of aircraft design. I'm sure, however, that not one of those 31 persons who attended the very first EAA meeting ever dreamed that things would come to what they have today . . . to an era in which homebuilts have become the cutting edge of lightplane technology, when **individuals** like John Roncz would be pushing aerodynamic research beyond heretofore known limits. Every EAAer can be proud that our organization has been the seedbed and has helped create the regulatory climate in which the John Ronczes among us would have the freedom to get their starts. Their achievements are, of course, their own, forged in sacrifice, personal risk and a great deal of hard work. They richly deserve every accolade that comes their way . . . and we are extremely proud of each and every one.