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ON 2 SEPTEMBER 2017, A NEW WORLD SPEED RECORD FOR PISTON-ENGINE PROPELLER-DRIVEN AIRCRAFT WAS SET BY STEVEN HINTON





Voodoo, Hinton made four passes over the 3Km course near May, Idaho, and shattered the existing record of 413-mph, raising the bar to an impressive 531.53-mph.

In doing so, Hinton followed in his father's footsteps. In 1979, Hinton Sr. broke the 3Km record in the RB-51 The Red Baron at 499.018-mph. Lyle Shelton upped the record again in 1989; he and Grumman F8F-2 Rare Bear blazed through the timing gates for an average speed of 528.330-mph. When the

> Fédération Aéronautique Internationale changed the rules governing aircraft speed records, Shelton's record was retired.

The new record makes Voodoo the world's fastest piston-engined aircraft. When asked about the record run, how the engine performed, and how intense the flying was, Hinton said, "It's the longest twelve-minutes. Ever."

The story leading up to the speed record was secretive, dramatic, and fast-paced. Time was very short, there was a lot of work to accomplish, and answers to engineering questions were yet to be delivered. With a goal of setting the record in July or August, the program was finally greenlighted in late February 2017. This meant there were fivemonths to engineer, design, produce, install, and test some very advanced modifications to the airplane.

It also had to come together and work the first time.

Even with the daring new modifications, an age-old question remained... assuming the new mods worked, would the

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strung-out Allison-rod racing Merlin be up to the task? Racing at Reno is one thing, but pushing the power way past that level to full throttle and 3450-rpm was uncharted territory. How long would it last? Would it last?

The answer played out like an aviation soap opera over the three-week effort.

Once settled at the site, Hinton flight tested the airplane, worked the power up to higher levels, figured out a few mysteries, and worked hard with the team to overcome some major problems.

PLANTING THE IDEA

As a teenager, Steven Hinton had stumbled upon a silver trophy cup in the attic; it was presented to his dad for the 1979 speed record. Young Hinton put it on his bedroom shelf, where the tarnished cup served as an inspiration. "It wasn't even really a dream back then, it seemed so far away." Now 30-years-old with a wealth of experience, Hinton's desire and ability to break the same record was in reach.

The next piece of the puzzle had actually been put in motion years ago.

Joe Clark, a principal of Aviation Partners, Inc., had the desire to sponsor a modern speed record attempt. Clark had been friends with the late Chuck Lyford, a hard-charging air racer from the 1960s (please see Tim Weinschenker's appreciation of Chuck Lyford in the September 2017 issue of our companion magazine Air Classics). Inspired by Lyford's competitive spirit and friendship, Clark dreamt of somehow being part of a new record. (EDITOR'S NOTE: Talking to



Joe Clark, Clay Lacy, and Steven Hinton. "When Steve Sr. was doing the record in the RB-51, I had the Lear up doing some photography," recalled Clay. "When that throttle went up on the Griffon, the Lear was left in the dust - perhaps as much as 100mph behind." (MOL)



Steve Hinton piloted the T-33 fitted with the unique nose-mounted camera to record Voodoo's flights. The Mustang passed the T-Bird as if the jet were standing still. (MOL)



Vintage V-12s owner lose Flores kept a close eye (and ear) on the two race Merlins his company supplied for Voodoo. (MOL)



The innovative two-piece composite cowl in just one of the many design features on Voodoo that aid in the aircraft's quest for speed. "It certainly makes it easier to remove and put back on compared to the standard cowling," comments Bernie Vasquez. (MOL)

Joe Clark on the Idaho ramp, he commented, "Know what my first Warbird ride was? It was in P-51D N2869D — the Bardahl Special — when I was 16 and Chuck was the pilot.")

"Joe actually approached me back when I was flying Strega," Hinton said. "He wanted to sponsor a speed record attempt, and we tried to make it work. But it came down to Tiger not wanting to risk his asset for little-to-no return. And that's entirely understandable."

Even though that effort faltered, Hinton maintained the relationship with Clark over the coming years. After Hinton switched to Voodoo, the idea was rekindled.

"I didn't want to just throw money at the attempt," Clark

said. "I wanted to add value." Through Aviation Partners, Clark was able to do just that. The company is well known for their blended winglets that make airliners up to 7.4% more fuel-efficient. The engineering assets at the company were put to full use: Make Voodoo faster than any other propeller airplane — ever!

Thankfully, Voodoo had been brought up to a truly competitive level. To Hinton, it was a necessary and important starting point, but even that wasn't easy.

"I joined Voodoo in 2013," Hinton

explained. "The airplane was sorely lacking in the qualities it needed to be a good racer." Hinton and the crew dug into the airplane and began to understand what it really was — and what it needed.

"A multitude of deficiencies were found, the least of which were incorrect airfoils and settings on the tail, vertical stabilizer, and wing. To make a long story short, it took years to bring the airplane up to Strega's standard," Hinton said. "There had been some talk of a speed record attempt, but I knew there was no way we

could even think about it if the airplane wasn't able to fly like Strega — and win Reno."

One by one, those items were corrected by the crew and Hinton. The canopy never really fit, so Hinton built a new one. The instrument panel was a mess, so Hinton built a better one. Voodoo's old fiberglass belly scoop was removed and replaced by a new design reminiscent of, but different than, Dago Red's. The cooling system was revised, and the coolant header tank was replaced with a closed-loop system.

They didn't stop there; the engine's thrust line was zeroed to the airframe.



This change required major time, effort, and engineering. "We didn't even know if it was possible," Hinton said. "There were questions about having enough space and how certain accessories fit, or if they would fit."

Once they decided they could do it, a new carbon-fiber cowl was fabricated as well as an Aerochia carbon induction trunk.

If that wasn't enough, Hinton copied one of Strega's biggest modifications: Voodoo's wing incidence was reset to zero. This was another domino-effect mod that affected structural components, wing-to-fuselage fairings, and control rigging. All were huge changes, and they happened fast. (continued on page 53)

THE FIRST ONE **RECOLLECTIONS ON HOW DARRYL** GREENAMYER TOOK THE RECORD BACK FROM NAZI GERMANY

"One day, we were in the hangar at Van Nuys working on the Bearcat. Darryl was removing some of the cowl from around the R-2800 and all of a sudden he stopped, looked at the rest of us, and said 'Guys, I have an idea."

Bruce Boland, a Lockheed Skunk Works engineer and one of the main forces behind Darryl Greenamyer's Grumman F8F racer was recounting a pivotal moment in American air race history. "We had been enjoying a lot of success with the Bearcat — we were doing it on the very slimmest of budgets but with a huge amount of talent — American talent. Something must have triggered Darryl because he then said, 'There is no reason those damn Nazis have the speed record so let's take it back!"

And there started the plan to capture the 3Km speed record set by Flugkapitain Fritz Wedel in the Messerschmitt Me 209 — basically the smallest airframe that could be built aroud a radically modified DB 610ARJ V-12 that could pump out an astonishing 2300-hp.

We do not have the space to go into the complete history of this machine, but that will be done in an upcoming issue. What we want to stress is the fact that in Germany there was a race going on to capture the 3Km record. On 31 March 1939, the Messerschmitt company — as well as rest of the German aeronautical industry — had been completely taken by surprise when pilot Hans Dieterle in the Heinkel 100 V8 (the V8 stood for the eighth prototype) raised the absolute speed record to an stunning 463.92-mph. This caused the entire Messerschmitt design team to sit up and take notice.

The modified DB 601ARJ was installed in the Me 209 VI (the first prototype, and considered aerodynamically inferior to later variants) and Wendel and the team waited for favorable weather. That happened on 26 April 1939, and Wendel raised the record to 469.22-mph.



The 3Km run was flown at Edwards AFB on 16 August 1969 and averaged 483.041-mph.

Now, Heinkel was going to have another go at the record but the Nazis stepped in and stopped the company. Their reasoning was simple —they were "advertising" the Me 209 as an upgraded variant of their Bf 109 fighter and the French and British were shocked that they might be facing a fighter capable of over 450-mph.

After WWII, a couple American pilots made plans to break the record in modified P-51s but nothing ever came of those attempts.

Darryl, Bruce, Ray Poe, Pete Law, Randy Scoville, Bill Kerchenfaut and a host of other talented Americans went to work on the Bearcat. The year 1969 marked the 30th anniversary of the German record and the 10th of August was set for the assault on the record. Given the complexities and the very limited budget, the record runs went very smoothly and the four passes produced an average speed of 483mph (highest pass was 510-mph). The record was in American hands and has remained firmly there ever since.

In a great show of sportsmanship, Fritz Wendel traveled to the USA to congratulate Darryl and present him with the award from the Society of Experimental Test Pilots for accomplishments in Air Breathing Aircraft for the year 1969. For the complete story of Darryl and his amazing Bearcat, please consult Air Classics August and October 2016. MOL

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If it seems like Hinton was doing most of the work, that's not entirely true. He was quick to credit his small band of friends that were spending long hours alongside him. BJ Healis, Frank Young, Bernie Vasquez, Cory O'Brian, Ben Marsh, and several others all played important roles in getting the work done.

Voodoo had always looked the part, but now she was really performing the part.

When speed record talks between Hinton and Clark resumed, all the pieces fell into place.

"After Strega, Joe and I kept running into each other at Reno and some other airshows over the years," said Hinton. "The speed record was discussed on many occasions. The idea was still there."

Hinton had the connection, and the planning, mechanical, and piloting skills. Voodoo owner Bob Button was on board. There was a great crew in place. Joe Clark had the vision and resources to not only make it happen, but do so on an elevated level.

Game on.

The minds at Aviation Partners landed on an idea to make Voodoo faster: Alter the wing's airfoil to push critical Mach from .72 to .76. A number of aerodynamic shapes — affectionately called "bumps" by the crew — were engineered and milled out of a high-tech foam. Hinton and crewmember BJ Heals installed the 35 pieces with corrosion-inhibiting adhesive and rivets over the course of two-weeks. Once filled, profiled, and sanded, the new wing was a radical sight to behold. The aft portion of the

Because of the ultrasmooth finish and glossy white paint, the wing modifications are a bit difficult to see but by running your hand over the wing you can really feel them. There is a very noticeable bulge to the wing and the change in configuration can be seen in the flap line. (MOL)



airfoil, from the root to the outer flap, was quite a bit thicker further back towards the trailing edge. The thickness scalloped out to a thinner section as it approached the trailing edge.

Even though the bottom of the wing appears to be a smooth, radiused airfoil, it received the same treatment as the top. "You have to look close to see any changes," Clark said.

Although the first two test flights were cut short due to unrelated problems, once the wing was tested, Hinton was very happy with the results.

COMPRESSED TIME

The team wanted to make their attempt in July or August. Temperatures would be hot — optimum for a world speed record. Clark's property, a private facility with a 7000-ft paved runway in rural Idaho (the longest private runway in Idaho), served as the



Karen Hinton recalls the RB-51 record run: "Steve helped with my worrying about him flying the RB-51 by explaining each step of what he would be doing with the Griffon-powered racer. Those detailed explanations really helped me understand how everything works while also reducing the stress factor. My son also did the same thing with me - so much so that I almost feel I understand Voodoo as well as he does." (MOL)



The racer takes a breather in Joe Clark's massive hangar. (MOL)

location. Many long days and late nights were spent getting the work done. Time slipped; the math between man and manhours wasn't cutting it. The July date slipped to late August, but the crew pulled it together. Hinton launched from Yolo County Airport, California (which was also one of the training bases in early 1942 for Jimmy Doolittle and his Raiders as they practiced for their attack on Japan) got the gear up, and turned for Idaho.

Upon arrival at Clark's airstrip, the crew unpacked their support truck, tool boxes, and equipment and prepared the aircraft. The Merlin had been relatively happy in testing back in California, but it sneezed during a high-power test flight days before the record attempt. Thankfully, the screens were clean, but the crew discovered a valve seat within the B-bank caused the problem (the interesting, and unusual, cause for this problem will be explained by Bruce Lockwood in the Air Classics Reno issue). The head and bank were removed and flown to Vintage V-12s to be fixed overnight by Jose Flores and his talented crew.

With the loss of several days, the team was forced to balance the weather forecast against time. Would the weather remain warm for another few days? How would this time slip effect their chances of making it to Reno? To make matters worse, the sky condition and visibility had been horrible just about the entire time; a record number of wildfires in the northwest were fouling the air with heavy smoke.

Luckily, as 2 September dawned, there was sufficient visibility to make the run. The Merlin's head and bank had been reinstalled, a new carburetor had been installed, and after testing, the airplane seemed relatively happy. This would be the day.

The crew spent the morning and middle day going over the engine and airframe, making sure everything was as perfect as it could be. The aircraft had been serviced with racing fuel, ADI, and spray bar water — all measured specifically for the run. The hottest part of the day, between 4-6 pm, arrived. The airplane was rolled onto the scales, weighed, and towed out to the runway. After a private crew briefing, Hinton gave a general briefing to the small crowd gathered to witness the run.

"IUST" FOUR PASSES

After donning his safety gear and chatting with his fiancé Jane, the two walked out to the racer. There was tension in the atmosphere. Hinton, the driving force in this endeavor, had invested more brain effort and sweat equity than most others. The weight of the outcome seemed to rest on his shoulders alone. But you couldn't tell by looking at him. He was accepting well wishes from others, smiling, and chatting with the crew.

All he needed was to make just four passes. All he needed was the engine to hold up for just four passes.

With little fanfare, Hinton climbed onto the wing, into the cockpit, and began strapping in. A short time later, the Merlin kicked over into a high idle, the oil temperature came up, and Voodoo taxied out. After a run-up, Hinton keyed the mic and transmitted, "I like it." With that, he took off for the history books.

Instead of entering an orbit like his





full-power, two-pass test flight, Hinton climbed out to a downwind leg for the course. As he staged the power up, focused and curt radio calls were exchanged with crewmember Bernie Vasquez. Vasquez was closely watching Voodoo's telemetry and keeping an eye out for the first sign of trouble.

Voodoo banked left and descended onto the course, its strange sound heard in the distance. It was the howl of high-RPM mixed with engine wrap-up: The white racer streaked towards the course. The sound grew, but not as fast as the airplane appeared to approach. It all seemed a little out of synch; Hinton and Voodoo made their first concussive pass.

It was incredible.

In sight for only a few seconds, he disappeared into the smoky skies to the west. It took several minutes to perform the course reversal, line up, and come in for the next pass.

All the while, the engine's short and unknown-duration fuse had been lit and was running out. The minutes after the first pass seemed to drag out. How could the V-12 possibly survive this torture? The howl of the prop, the massive amounts of engine exhaust streaming back, and the oil-breather spitting engine blood, the cacophony of it all... it was impossible.

And Hinton was sitting right there behind it.

That first pass was clocked at a stunning 554.69-mph. (EDI-TOR'S NOTE: And this was the pass that actually hurt and by that, I mean my ears. I was standing on the side of the runway and this was the only time — before and after — that I had heard a Merlin make such a sound. I compare it a bit to being near the Reno runway one year when either a Blue Angels' or Thunderbirds' pilot made a mistake and had his pass just a fraction inside the speed of sound — that also really hurt.)

> If Hinton liked it before takeoff, he was about to have second thoughts.



able oil blowing out the breather vents. He knew the engine wasn't giving its all.

"At this point," he said, "I could tell there just wasn't the power there should be." Cockpit footage shows only 117-inches of manifold pressure, noticeably short of the maximum.

But he kept going. Pass two was clocked at 527.3-mph the effects of the entry dive had worn off. He kept going. Pass three was clocked at 528.48. That was good news; at least the last two passes were about the same. But would it last?

Somewhere during pass three to the turn for pass four, things suddenly changed for the worse. In an instant, oil pressure dropped from 120-psi to 70-psi, a sure sign something in the engine was pissed off.

"That was pretty surprising," Hinton said. "The good news was the oil temperature and coolant temperature were stable."

Hinton made a quick decision. He was heading away from the only runway around at more than 500-mph, and that single runway represented safety and all the things in the world that were good.

Instead of his planned 2G course reversal, Hinton loaded Voodoo up in a 4.5G turn. He wanted to get back for the last pass — and make the runway if the engine guit.

The Gs scrubbed speed during the turn, and the fourth pass showed it. Clocked at 515.62, that fourth aggregate to the average hurt the bottom line. Voodoo flashed by a final

time, still fast, but noticeably slower than before.

As he passed the final course marker, Hinton pulled up, arching left and skyward towards safety — and hopefully the history books.

He couldn't think about that now. The engine was shuddering every several

moments, a sign of impending doom. On a high downwind, Hinton set up for an engine-out approach and landing. Turning final, he S-turned slightly to see the runway, but felt he needed a burst of power. He moved the throttle forward, and nothing happened. He moved it a little more, and still nothing. Giving it a good shove half-way up, the engine finally responded with a highly protested and final burst of power.

"Even then," he said, "it was just kind of noise and RPM, there wasn't any power behind it."

Seconds later, the main wheels touched the runway, and Hinton cut the mixture on what was left of the Merlin. Coasting to a stop at the end of the runway, he turned off the aircraft's switches, and unbuckled his helmet, parachute, and seatbelts. For better or worse, it was over.

FOR THE RECORD

Voodoo's sides were heavily streaked with a beautiful brown plume, itself a lesson in aerodynamics. There was also a comprehensive coating of oil from the engine's breather vents on the aft fuselage. Hell, oil was even coming from the lower cowling into the landing gear bay, another sign of the Merlin's anger.

Hinton, cold beer in hand, was debriefing with the crew and talking with friends. In the hangar, the FAI official was crunching the numbers so see if there was a new record.

There was,

Hinton's average speed with the dying engine and a speed-scrubbing turn was 531.53-mph. Although it didn't beat Shelton's old record by the amount the team desired

> (EDITOR'S NOTE: To beat that record, the FAI requires 1% — now that does not seem like a lot but at this (continued on page 66)

Timer Brian Utley's notes on the speed run's four passes. (Richard Hodkinson)



Steven decided to shut down the Merlin after landing from the speed run. The racer is seen being towed back onto the ramp. (MOL)

THE LONGEST TWELVE-MINUTES (continued from page 56)



A happy — but very tired crew — assembles in Joe Clark's hangar after the speed run. (MOL)

With Reno race markings added, Voodoo heads out for its qualifying run at Stead Field on 13 September. (Jarrod Ulrich)

speed that single percentage point was huge), it was still a new record, and the world's fastest pistonengine airplane was sitting right there to prove it.

Amazingly, the Merlin's screens were clean upon inspection, but there was a lake of oil within the induction trunk and several nose case studs were broken. B-bank was again the culprit; two cylinders were down on compression. Although the engine wasn't truly blown, it was used and abused to the point of impending failure.

With a short window of time before Reno, the crew went right back to work to install the second race engine. These guys weren't done, they weren't satisfied, and they were going to do it again.

They wanted that bigger record they worked so hard for — 531-mph was pretty damn good, but they knew they could do better with a engine that would make power.

Unfortunately, it wouldn't be. The engine change went quickly, but the smoky skies represented a specter that denied further record runs. There just wasn't a way to safely test the new engine and wait for smoke-free skies.

PAST THE LIMITS

In retrospect, Hinton and the team were obviously happy to set a new record, but it was by how much that gnawed at them. "Overall, I'd give us an 'A' for the effort," Hinton said, giving praise to his crew for their hard work and dedication. "We could have made a few different decisions in hindsight. And yes, we would've liked to have beaten the record by more, but we did what we set out to do."

Considering the last two 3Km records were broken by aircraft with engines of more than 2000-cubic-inches, Voodoo's "measly" V-1650 Merlin did pretty good considering it wasn't operating at its potential.

One man, one Merlin, and approximately twelve-minutes. Each minute was stressful, but the last several must've been agony. That's what breaking a record takes; and very few people have the grit to weather that. It also takes a real team; the right leaders, the right sponsor, and the right crew. Every one of these people, those that put their hands on Voodoo for this endeavor, deserve recognition worthy of those that pioneer new ideas in the quest to break accepted limits.

At this time, Hinton isn't thinking about coming back for the record next year. "I just want to get through Reno, and hopefully be successful there. Then I want to sleep for two-weeks," he laughed. When pressed about the possibility of another attempt next year, he said, "Joe Clark is hot on that idea. Button is supportive as well. Ask me in a few months and we'll see if I'm willing."

Stainforth, Agello, Hughes, Wendel, Greenamyer, Hinton Sr., and Shelton have chiseled their names in aviation history. Steve Hinton Jr.'s name joins that list, a further reminder that Americans once valued and marveled at each new broken record. This achievement is a statement — we are lucky to have bold men that still push the limits of man and sky and machine.