



SPORT AVIATION

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THE DENIGHT SPECIAL

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THE DENIGHT SPECIAL, a two-place aircraft powered by a Lycoming O-235, is based on the Pazmany PL-4A, which is a single place design by Ladislao Pazmany.

The story behind this airplane started some thirty years ago in Pennsylvania. As a young boy I went to the airport as often as possible with my father, Bart Denight. Dad built his homebuilt in 1948. The first Denight Special #97 was a Goodyear Trophy racer. Over the succeeding years, Dad assisted Nick D'Apuzzo and Rod Jocelyn in the modification of a Great Lakes and Culver Dart and the construction of the first PJ-260 for aerobatic use. He also owned an Aeronca C-3, Piper Cruiser, Culver Cadet and a Great Lakes. He was a member of the U.S. aerobatic team in 1962 at Budapest, Hungary as aircraft mechanic.

I guess with an upbringing like this it would only be natural to build an airplane. I was looking for a project for some time but had not found one that I could afford to build.

It was in February 1973 that the PL-4A appeared on the cover of a major aircraft publication. I consulted my dad, who said it looks good but check it out before you start building. I then took a trip to California to visit Mr. Pazmany and after looking over the airplane and seeing the quality of the plans, I decided to start right in on them. June 1973 was my starting date . . . and was I ready!

At first I was thinking of a single seat with VW power . . . then I decided on a two-place. After much thought about how to get the necessary horsepower from a VW at 5,000 feet (Denver elevation), I finally admitted I needed an aircraft engine and started looking for an O-200 Continental. But one evening an ad appeared in the newspaper for an O-235 Lycoming and I bought it for 1/3 of the then-current price of an O-200 Continental.

This sealed the fate of the airplane — it would become a two-place with an O-235 Lycoming (108 hp). It was the quality of the plans and the over design of the airframe that made these modifications possible.

The Lyc is a little heavier than the Continental and the PL-4 is short coupled, however, I decided not to carry lead in the tail. So, before the fuselage was started, I did some weight and balance work and concluded the fuselage tail cone should be lengthened by 14 inches. This was in addition to the fact that it was widened 12 inches to be a two-place aircraft. At this point I asked an aeronautical engineer to look over my plans and calculations and everything was given a clean bill of health.

I must say that to modify an existing design is not an easy task. There are many unforeseen items that come up and bite you, and a number of previously completed parts must be redesigned and modified to work on a new airplane. I also wanted a full dual control

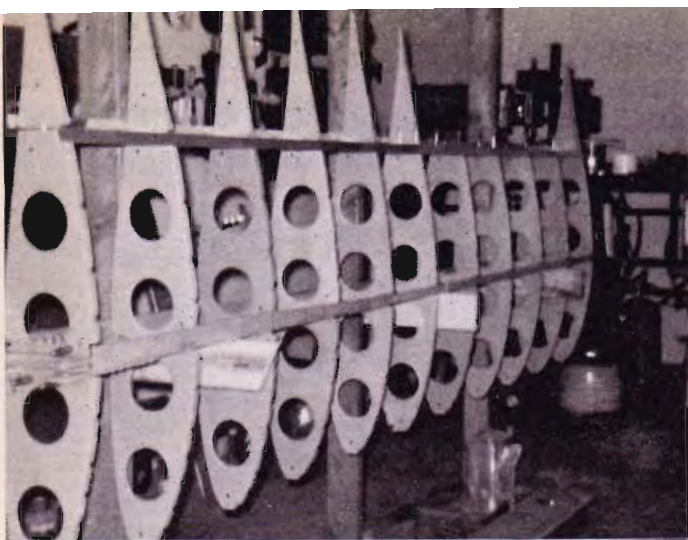
SPECIFICATIONS

THE DENIGHT SPECIAL N197D

Length	18 feet
Wing Span	26 ft. 9 in.
Empty Weight	765 lbs.
Gross Weight	1250 lbs.
Engine	Lycoming O-235
Performance (estimated) on new prop:	
Prop	70 x 62
Cruise Speed	130 mph
Stall Speed	55 mph
Rate of Climb	1200 fpm

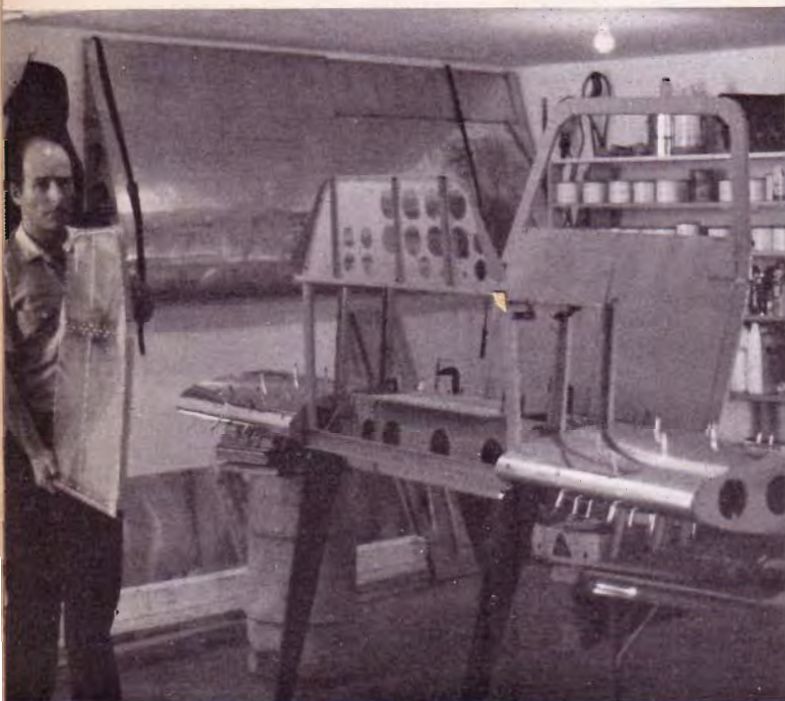
The 2-place PL-4 ready for weigh-in and weight and balance calculation. The contour of the Denight front yard proved handy in leveling up the airplane. (Photo by Gene Horsman)





A wing panel in the jib. No redesign or beef up was done to the PL-4 spars. At 1250 pounds gross weight, the maximum stress load is 4 G — Normal Category, Ron considers it.

(Photo by Ron Denight)



Ron Denight with the start of his fuselage/center section.

(Photo by Danielle Denight)

Detail of dual sticks — and supporting bridge between the wing spar carrythrough and the landing gear beam.

(Photo by Ron Denight)



system, so this had to be designed from scratch to fit around the original design criteria. This was not completely possible so I elected to modify the aileron control linkage. The linkage is all ball bearing and the movement is very smooth.

The Lycoming engine is tucked back as close to the firewall as possible. The mount is patterned after the Super Cub and is a swing out unit constructed of 3/4 x 049 4130 steel tubing.

The overall construction went rapidly once I figured out how to solve the problems involved in the mods. The cabin enclosure was particularly challenging — and was eventually solved by using the same type windshield and cabin door design as the Culver Cadet. The landing gear was altered, as I did not want the gear spread to be too wide. The gear was laid out with new angles and length to maintain the original height and tread width.

The new gross weight also had to be considered here. It was found that my gear was very similar to the Cavalier, therefore, a set of Cavalier plans were studied as this aircraft has a gross weight comparable to my needs. This gear is constructed of 1/2 inch 5160 spring steel and I feel it may be a bit too soft for my aircraft. I may build a new gear of 5/8 material to stiffen it a little. I may be a little hard nosed here, as all of my flying prior to my homebuilt is in my Luscombe 8A. I am going to get some time in a Cessna 140 or a Citabria to evaluate my landing gear.

The rudder pedal assembly is a highly modified Piper Tri Pacer unit. It is fitted with Cessna castings for the toe brakes on the left side. On the right side no brakes are provided, as the pedal can be folded forward and disengaged by removing a pip pin for passenger comfort.

This aircraft was originally designed with a folding wing, but I did not build in the folding feature. However, I did put the wings on my bird in one-half hour the other day. At one time I was considering carrying the fuel in tip tanks, as the main holds only sixteen gallons useable. I may build some auxiliary tank in the future.

Since this aircraft is a one of a kind, the engine cowling was a major undertaking. A mold was constructed on the airplane and the engine. The cowl was then laid up in fiberglass.

The engine is fitted with a Cochran stainless steel crossover exhaust system, also a starter and a Honda Civic alternator with a Chrysler solid state voltage regulator. The wheels and brakes are Goodyear 500x5 units with some minor improvements for reliability and serviceability.

The plane was completed in September 1981, inspected by the local GADO people and issued an airworthiness certificate. The FAA here is an excellent group of people.

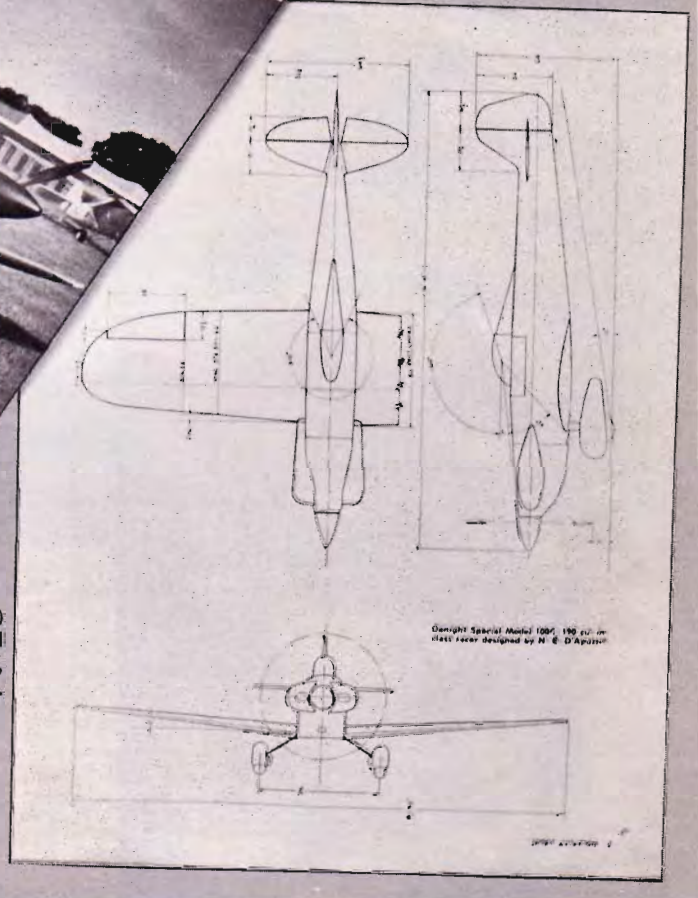
I made the first test flight on Sunday, October 4, 1981. The flight was uneventful; all engine temperatures were O.K. so the cowling and baffles must be providing adequate cooling. On take-off the aircraft will roll straight down the runway, as the engine is offset to the right. Acceleration is very rapid and flying speed is reached in a very short distance. Climb out feels very good at 95 mph (indicated). It has an excellent climb capability, as it weighs 765 lbs. empty with 115 hp and 89 sq. ft. of wing area.

In flight it handles like a little fighter. It is very responsive to the controls and is a joy to fly. All of this would not have been possible without the help and advice I received from my friends Ralph Borden, Dean Cochran, Brad Davenport, Gene Horsman, Irv Herrman, Bill Marcy, Mike Romero, and my dad, Bart Denight,



(Photo Copy by Marian Cavadias)

Bart Denight's Special appeared on the cover of the April 1962 issue of *SPORT AVIATION* and now, twenty years later, his son Ron's Denight Special makes the April 1982 cover.



who passed away in 1978. I only wish he could have seen the finished product.

No plans are available for my mods or for a two-place PL-4 at this time.

My next project will be a replica of the original Denight Special #97. This will be a sport plane powered by a small Continental engine and a little more wing area for ease of handling. This airplane was featured in *SPORT AVIATION* in April 1962.

During the past eight years I have learned more than one can imagine about airplanes. More important is that I found that I have a very wonderful family. My wife, Marilyn, and daughters Danielle and Donna were a great help during the building . . . and on occasions like the time when I was down after tripping up on my nose and they went over to Univair and bought a new prop.

I hope to have the airplane at Oshkosh '82.

Detail of walking beam for aileron actuation.

