

MARTIN SIMONS' PN9F

A small 3-view of Dieter Paff's PN9f appeared in The White Sheet (#7, Feb/Mar 1982; the "Flying Wings Special"), and a photograph of a PN9f constructed by Martin Simons appeared in the December 1988 issue of RCSD.

We are impressed by the design philosophy Dieter used for the PN9f, and recently asked Martin to describe the model for readers of "On the 'Wing." Martin replied with a copy of the article which set him off on this particular project (Radio Modeler, March 1980), together with some other interesting bits of information.

DESIGN PHILOSOPHY

The PN9f is just one of many of Dieter Paff's models; it is actually the sixth in a series of models of a projected full sized sailplane. A wider fuselage would be incorporated in the full sized 'ship.

The PN9f was designed as one approach to high aspect ratio tailless design, and as a result has a wing geometry which is rather unique. The leading edge is straight, while the trailing edge has a double taper. This configuration was designed to provide optimum pitch stability, and elevator leverage is enhanced by having these surfaces placed well aft of the CG. The ideal elliptical lift distribution is achieved at minimum sink rate through a combination of wing geometry and airfoil selection.

Dieter's model was constructed utilizing foam core wings with obechi veneer skins. Each wing panel weighed just 17 ounces, and total weight was just under 60 ounces. Martin's model, constructed by the same methods, came out excessively heavy in comparison. He blames this on a combination of factors: less care in selection of materials, 2 mm wing skins, and a large amount of lead in the nose to achieve a proper CG location. Additionally, Martin added a braking parachute which is operated by a special



servo and is enclosed in a compartment in the rear fuselage. A complete weight breakdown for Martin's model is included at the end of this column.

DETAILS

Several small but very important details are incorporated in the PN9f. The elevator hinge, for example, is center mounted, giving a relatively gapless fit. Additionally, the leading edge radius of the elevator is slightly larger than the trailing edge of the wing at the hinge point. This gives smoother air flow (and less drag) when the control surface is deflected. Also, since the elevators are a part of the reflexed section of the wing, and hence subject to heavy air loads even in level flight, Flettner flaps have been added. Flettner flaps are small tabs bent in the direction opposite to the reflex curve. They push the elevators upward against the downward air load, acting as an aerodynamic balance. (Several of Dieter's models were lost before this corrective action was incorporated.) Lastly, the ailerons are hinged at the upper skin, and differential is provided by the servo output wheel. This set up is very effective and allows fine adjustments without major linkage changes.

FLYING

Martin tells us his PN9f flies very well off the slope, but due to its being overweight it has not been winch launched. Aileron differential and coupled rudder are used, and adverse yaw is in evidence if the aileron-rudder coupling is disconnected. The elevator is not sensitive, as it is with most planks, due no doubt to its location well aft of the CG. The Flettner flaps are very efficient at reducing servo loads.

Photos for this column are courtesy of Martin Simons.

PN9f WEIGHT CHART

Wing: cores, white foam and 'glass	550 g
skins, 2 mm obechi	840 g
covering, glue, wing rods	<u>95 g</u>
	1485 g
Fuselage pod, bare:	470 g
Radio:	370 g
Lead, parachute, paint, etc.:	<u>490 g</u>
TOTAL	2815 g
Dieter Paff's model:	<u>1692 g</u>

