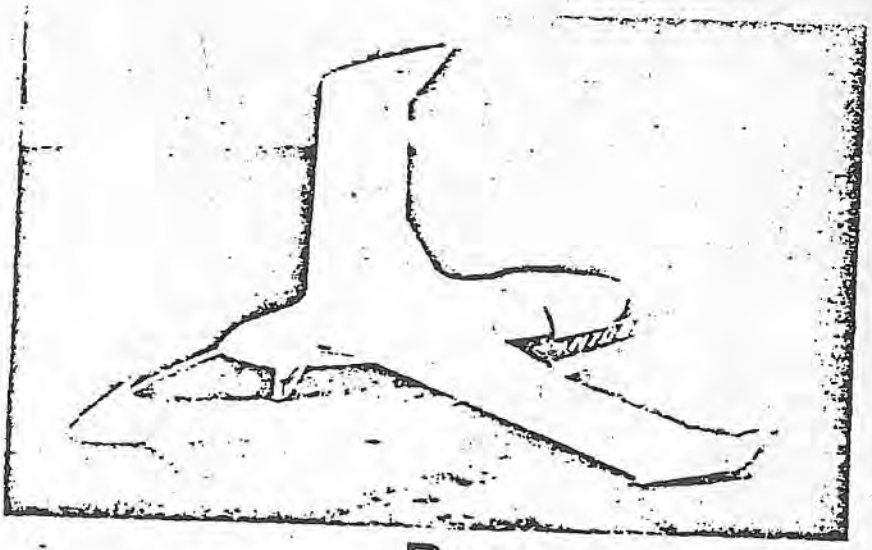

Kasper Aircraft In

Works WITH Nature

Doesn't Fight It !

Promotes

SAFETY and EFFICIENCY

(The Controlled Flying Wing)

Dear Sir:

I would like to point out some basic properties of my wing concept, which makes the Kasper Wing so different from the cross tail planes and other wings.

1. The pitch control does not depend on forward speed of the airplane. This means that the wing retains full controllability at any speed from 0 to maximum. It can be "parachuted" down in a nose up attitude and turns can be made in a 45° nose up attitude, without the plane falling over the wing.

2. The stall is completely eliminated. There is a transition speed when the potential airflow on top of the wing starts to separate, which has been named "stall" and beyond which no plane can go. However, my wing can be lifted to a higher angle o attack, and up to now an unknown phenomenon is starting: the airflow on top of the wing reverses its direction flowing forward, forming a vortex, around which the potential flow is rotating. This phenomenon is known as "Magnus" effect and produces lift coefficients on the order of 12-18, and even more, depending on the speed differences in the vortex and the speed of the external flow. This phenomenon keeps the birds flying in full control after flaring out for landing at zero forward speed, parachuting gently for a point touch-down. The EKB-1A which "stalls" at 40 MPH with a sinking rate of 600 ft/min., pitched up a higher angle of approx. 35, slows down to 15 mph maintaining a sinking rate of 150-200 ft/min., depending on temperature.

3. The pitch and directional stability of existing planes are kind of "oscillat not functioning as a stable system which would return the plane, after a disturbance, to the intial position. Only with the help of damping, the planes return to the initial attitude after a number of oscillations. My wings have a stable system which returns them to the initial attitude with half of an oscillation. This kind of stability was described by a pilot, specialist in stability and control tests, as follows: Quote: "This plane has no dynamic stability. It will not oscillate, instead it shows an 'uncanny' dead beat stability, returning to the initial attitude, after being disturbed by the pilot or gust, and this with hands off the controls" unquote.

4. This is the only wing which has been tumbled backwards and forwards at will and recovered. All other 7 wings (5 of German design and 2 from Northrop) which tumbled, crashed in the ground, killing the pilots. This led to the erroneous belief that tumbling is a steady state, and once it occurs, it cannot be stopped. The EKB-1A disproved this.

Letter from Kasper "some basic properties of my wing concept, which makes the Kasper Wing continued -

5. The PKB-1A earned the first and only acrobatic license of the highest degree "any acrobatic maneuver including tumbling, without altitude limitation". This is the first in the world for a wing.

6. Since the elevators are located at the tips, the loads are greatly reduced. Up to 4G, the wing bends down, not up. Conservatively, the maximum bending moment of the wing is reduced to 25%. This means that a plane designed to withstand a gust load of 3.5G can withstand a pull-out of 14G without exceeding the same bending moment as a cantilever wing. In other words, the wing will kill the pilot first before it breaks up. Maximum G for people is +9G and -5G.

7. Due to the absence of the tail, the wing cannot develop torsion during pull-out it is stressed only by pure bending forces, consequently it can be built much lighter

8. Due to the absence of the tail structure and aerodynamic loads on the tail, this total weight of about 30% of the total weight of the plane can be carried as additional payload.

9. Since the fuselage is not stressed (bending and torsional stresses) it can be built much lighter. The same applies to the wing, which has to support only pure bending loads.

10. With the absence of the tail surfaces and the necessary supporting structure the drag is sufficiently decreased, by about 25% of the total drag of the plane. This results in less power needed for the same speed or more speed for the same power.

Summing up, we get a plane which never gets out of hand, never stalls, can carry about 30% more payload with 20% less power.

Witold A. Kasper

WITOLD A. KASPER

13. Letter from Kasper