MOCK-UP MODEL COMPANY
Architectural - Industrial Machinery - Aeronautical - Display Models
3704½ So. 164th / Seattle, WA 98148 / 244-5653

20 Jan 1977

Subject: Flight test & evaluation of radio controlled models of Kasper flying wings of 13 degree & 20 degree sweepback 1.5 & 1.2 H.P. engines with 14" & 10" Dia propellers in pusher configuration.12,ooo & 11,500 R.P.M. respectivly.

Description: "A" Model:13 degree sweep,8 ft.span,16"cord,balanced at 20% MAC optimum,16 lbs take off weight.Payload 20 lb.

"B" Model 20 degree sweep,6 feet span,13" cord,balanat 28% MAC,optimum.8 lbs take off weight,no payload.

Estimated take-off run from stop 150 ft.,speed 30-35 mph. Climbing at approx.10 degree angle,level top speed of 70-75 mph max. 20 - 25 min.,landing speed same (power on). Acceleration seems 15-20% quicker than conventional models. Upon landing there is a tendency to float,even with the high drag landing gear,making it difficult to judge the touch-down point within 50 feet."A" model seems to have a glide ratio of approx. 14-16 to 1.

Controls & response: With the CG well fwd. elevator response was poor, but sufficient to maintain 10 degree climb angle.20-25 degrees of up trimm of the stabilizer was neccessary to take-off in nose heavy condition.Elevon and rudder controls were mild but sufficient at this time,in both "A" and "B" models.

With the CG at optimum all controls seem mildly sensitive and well harmonized.

With the CG at the rear limit,the horizontal stabilizer becomes overly sensitive,the elevators are ineffective at speeds below 30 mph.("A"),17 mph.("B"),rudder controls are adequate at all speeds. Stabilizer trim must be reset according to the airspeed.

Tip rudders:each independently operated,moving outwards 90 deg. operated simultaneously as air-brakes.They were overly sensitive on the "B" model but no overly so on the "A" model.When activated - a slight roll coupling is noticed first then a yaw,the rudders are sufficient in roll as to make elevons un-neccessary and redundent. Properly balaced the models both automatically hold the nose up in the turns,demonstrating great inherent stability.The stall is straight forward and can only be induced deliberatly powerpn;cutting the power suddently in a steep climbing turn,the models dropped the nose,leveled the wings,and assumed a normal glide angle,all without !!!! pilots assistence.

Note:there seems to be no significant difference in control behavior in as much that the 20 degree sweep-back model weighting 8 lbs with a 6 ft span and a much lighter wing loading.

With the 20 degree model,ultra slow speed flight was maintained remaining airborne 25 minutes on 6 oz.of fuel.

descents were made on the fringes ot the vortex lift that make me believe that with more experience and practice,the bird type landings can be a practical reality.

MOCK-UP MODEL COMPANY
Architectural - Industrial Machinery - Aeronautical - Display Models
3704½ So. 164th / Seattle, WA 98148 / 244-5653

Summary and general comments:

The KASPER Wing Control System seems comparable in every way to conventional designs, however having violent responses to aft. CG locations and loss of drogue stability and uncontrollable spinning with sudden loss of power.

With the CG properly located both models were inherently stable on all axis, and impossible to spin and very stall resistent.

The larger 13 degree model seems readily capable of carrying a 20 lbs pay-load in addition to its own weight of 16 lbs.!!!!

The tip rudder (Plate) arraingment seems to cancel tip drag, The Wortmann laminar flow wing section seems also to have high lift, low drag and is thick enough to lend high structural integrity.

I am favorably impressed with the efficiency of this design, as compared to other scale and experimental configurational models I have build, flown and tested.

Thomas L. Richards
Manager.

10 - -

2