



XM-1 FLYING WING	
DESIGNED BY	J. MARSH
SPAN	38 FT.
WING AREA	162 SQ. FT.
ASPECT RATIO	9.0-1
WING LOADING	3.1 LBS./SQ. FT.
EMPTY WEIGHT	310 LBS.

routine ground slides were made at speeds up to 30 mph to see how it would handle. I had a bit of trouble getting used to the independently operating rudders. However, aileron control was very good and it was also possible to balance the glider on its wheel by the use of the elevons. The next tow was to be a slow acceleration up to 40 mph to see if it would fly. The tow started off well, lateral control was good but the rudders were a bit sluggish. At 30 mph the control wheel was brought back and the ship responded with the nose coming up to take-off position. At 40 she was airborne and I leveled off and held her on a straight course for a few seconds before trying a few gentle pull ups to get the feel of the elevators. All controls responded smoothly and firmly. Looking ahead I could see the tow car was approaching the end of the run. Upon release of the towline the sailplane suddenly dropped as if stalled out. Applying full back pressure did not remedy the situation and the resulting drop to the ground shook both glider and pilot. I was thankful that I had a thick cushion under me and a strong glider to withstand the shock of a hard landing. That was enough flying for that day, at least till I found out what had happened. Checking with Paul Wilhelm, who was driving the tow car, I learned that when the tow line was released I was flying only a few mph above the stalling speed. What had happened was that with the C.G. tow hooks located considerably below the center of gravity there is a tendency for the tension of the towline to hold or bring the nose up. Also, by applying full back

pressure suddenly is much the same as raising flaps on an airplane just before touchdown.

The following weekend we decided to have another crack at it. I climbed into the cockpit and gave last minute instructions for the flight. This flight called for 50 mph and a free flight glide. Release was to be made only a few feet off the ground so if it would drop I would not have far to go. Once again airborne I rose very quickly from the ground due to the kiteing affect of the low tow hooks. At about 12 feet I pulled the panic button, I mean the release button, and gritted my teeth for a possible 15 foot drop. But instead I found myself chasing the tow car down the runway and was gaining on it. Leveling off, the airspeed dropped from 47 to 42 mph. My glide seemed ex-

ceptionally flat and I just floated down the runway. This flight revealed a lack of directional control causing the craft to rotate about its vertical axis as other plank designs have experienced. Since it would be unwise to try any further tests it was decided to send the ship back to the workshop for modifications.

MODIFICATIONS OF 1959

Because college studies kept me busy throughout 1958, modifications were not completed until September of 1959. The first change to be made was the relocation of the tow hooks to eliminate the kiteing affect. This was accomplished by raising them approximately 5" to bring them closer to the center of gravity.

The previous lack of directional stability had required the pilot to be on his toes all the time. To rectify this situation the fuselage length was increased by 9 inches and the hood given a dorsal fin look. A new and larger set of fins were constructed which replaced the drag flaps with differential rudders of double the previous area. Also, the independently operating rudder pedals gave way in favor of the conventional setup. During previous take-offs I often found myself sitting there with both rudder pedals depressed, which added drag besides being disconcerting.

TEST FLIGHTS OF 1959

By September all modifications were completed and I was anxiously awaiting a chance to fly her again. After assembly of the craft at the airfield and several ground slides later it became apparent that there was a marked improvement in re-
(Concluded on page 14)

The author in the XM-1 as it appears today.

Photo: Paul Wilhelm

