

1/4 Scale Pioneer II-D at 60 Acres

Jim Marske's "Pioneer II-D," mentioned many times over the years we have been writing this column, was the subject of our first venture into scale sailplanes. Our model, constructed in 1989, was built to quarter scale and flew successfully at the first Scale Fun Fly in Richland Washington that year. A couple of years later it got kind of crumpled on the same slope, victim of pilot error. Both wings were broken about half way out, and the front of the fuselage was pushed in. A member of the Seattle Area Soaring Society bought the carcass and set about the task of repairing the damage.

Around mid summer of this year we received a call from Don Bailey, also a SASS member, who had subsequently purchased the partially repaired glider. Don had completed the repairs, recovered the wings and vertical tail, and painted the fuselage. Armed with the correct CG location and control throw information, he planned to enter the Pioneer in an upcoming scale contest at 60 Acres in Redmond. We were pleasantly surprised to hear that our creation had not only been reborn, but was to be flown in thermal conditions, something we never had the chance to accomplish.



Don Bailey, Bill, and the Pioneer II-D at 60 Acres

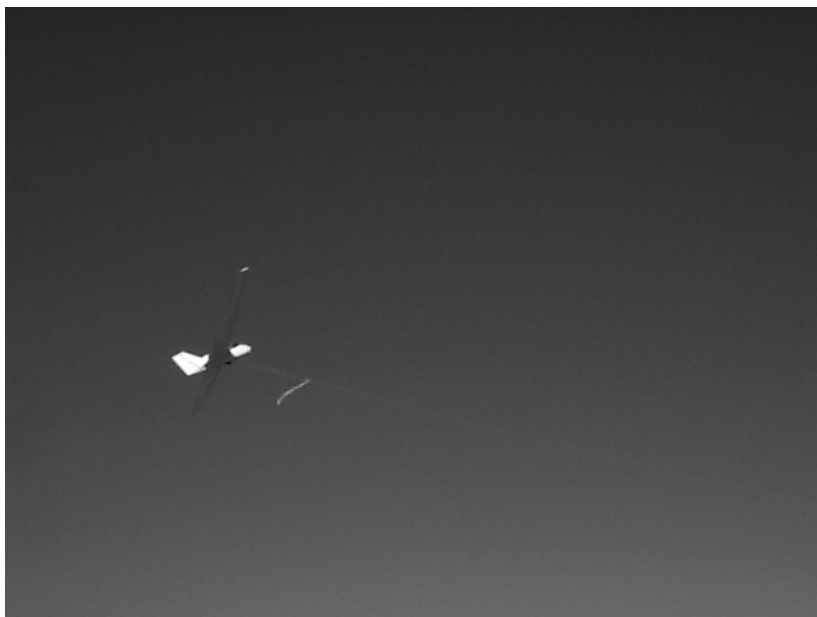


At 60 Acres in August, we got a chance to see first hand the change which had been imparted. Don had replaced the releasable tow hooks with more standard fare and constructed a bridle which snapped onto the end of the winch line. A large battery pack reduced the necessary lead in the nose to a minimum. Now all white, the Pioneer looked just like its full size counterparts.





Before taking it up on the winch, we rechecked the CG and control throws. For safety, a bit more lead was added to the nose. Control throws looked good, and Don set up the transmitter to mix rudder with aileron. The first launch offered a surprise in the form of a tip stall relatively close to the ground! Don corrected rapidly, however, and once off the towline the Pioneer settled into a rapid glide. The tip stall problem, which was never experienced during slope flying, should not have come as such a surprise. On the slope,



very high lift coefficients were never needed. A winch launch, however, puts very high lift demands on the wing. A relatively small chord at the wing tip, coupled with the airfoil of the full size Pioneer II-D, makes tip stall a likely difficulty.

With some down trim in the elevator, the second launch was better, with no evidence of tip stall. Over the next few launches and glides Don got things pretty well sorted out. Some lead was taken out of the nose, the down trim in the elevator was retained, aileron-rudder mix was turned off, and a trim tape trip strip was applied to the outer third of the wing at about 20% chord.

These changes, taken one at a time, almost eliminated the tip stall problem, so that it became evident only when the angle of bank approached about 50 degrees. Despite having to hold the bank angle to below 50 degrees, Don did manage to get some thermal flying in during the contest. The Pioneer appears very realistic in flight.

Don completed all of Saturday's contest flights and took the Pioneer out for a second day of flying on Sunday. Now somewhat used to the Pioneer's flying characteristics, he seems satisfied with its performance and told us he plans to finish the project, to include full detailing of the cockpit and fabrication of a clear canopy.

We're looking forward to seeing the Pioneer compete again later this year.

Special thanks to Steve Cameron for taking pictures while we were assisting Don at 60 Acres.

An additional note:

Don eventually fixed the tip stalling problem by placing a couple degrees of washout into both wings. This is not usually a recommended procedure for plank planforms, as it actually decreases stability. However, Don was desperate. Perhaps washin was put into the wings during repairs, and the washout Don added actually brought the wing tips into a zero incidence condition as related to the root.

Don was out at 60 Acres on 31 August 1997, and was able to fly pretty far out, taking advantage of some light ridge lift at the east end of the field. He was also able to bank at angles greater than 60 degrees. One flight lasted well over 15 minutes. He said it is sometimes difficult to keep track of the actual pitch angle of the aircraft, as the fuselage is short and relatively chunky, but he is now extremely pleased with the overall flight characteristics.