ADDITIONAL COMPARISONS

by Dr. Paul B. MacCready, Senior

In my previous article "More Comparisons," the high speed characteristics of the planes were not included. Some feel they are not too important, forming only a very small aspect of International flying. They do enter very much into the picture of American flying. I had hoped to get more flight test data from the pilots. This is very difficult to obtain as it has not been worked out too accurately for most of the present day competition planes. However, what data I have will be presented and a notation made if it is the designer's calculated performance or flight test data. I personally assume responsibility for any errors in interpolation.

Credit was erroneously given to me for the excellent picture which accompanied the article. Most of them were from the series taken by Paul Jr. and which many of the S.S.A. membership have seen. Since we were the fellows in those terrible looking monkey suits chatting with Cijan (under the wing of the Meteor) credit for the first picture must go to Betsy Woodward who took this picture. Also there are a few minor corrections which should be noted from the original article.

No aspersions were meant to be cast at the top flight pilots who flew in our Nationals. If you will check the first five places in our last three Nationals and the last Internationals you will find there are a total of 11 pilots. Over half of this group have been frequent repeaters. These pilots would hold their own against those seen in International competition—assuming their share of luck and lack of interference.

It is my personal feeling that the Internationals are won by planes that have only 75 to 85% of the maximum glide of the best performing planes but usually have a lighter wing loading and better thermal and landing performance. I have personally observed only the last four Internationals and this comparison has held true for this one factor of maximum glide. However, in two of the contests the high L/D planes had been damaged early in the contest so that a fair comparison could not be made.

Photo: Betsy Woodward

From all the available data the Elfe M, shown here, would appear to be the finest sailplane ever built, as it is said to out-perform the RJ5 at low speed and the Jenny Mae at high speed. Only those who have flown against the latter two sailplanes will appreciate what it must be like to compete against the Elfe M in conditions such as prevailed during the 23rd National

The circling speed of a plane in average thermals is purely a subjective figure but it indicates what the plane can do in very light weather. It usually runs 3 to 6 m.p.h. higher than the stalling speed and 3 to 6 m.p.h. under the maximum L/D speed. The R J 5 has had the most accurate flight tests of any plane under discussion. It stalls at 38 m.p.h. and its maximum L/D is obtained at 50 m.p.h. Its circling speed is usually 45 m.p.h. Now look at some of the figures which have been published for the Elfe M (Swiss Aero Review Aug. 31, 1956 and Sailplane and Gliding Oct. 1956). These are the designer's calculated performance figures which he stated were equalled in test flights at a wing landing of 5.31 lbs/sq. ft. The maximum L/D is 44 to 1 at 62 m.p.h. The sinking speed is given as 1.8 ft/sec at 43 m.p.h. According to this, the stalling speed must be in the neighborhood of 40 m.p.h. The speed of 22 m.p.h. between those two speeds seems fantastic. The figures given are not sufficient to determine the minimum sink at 100 m.p.h. but by projection it could be interpolated to read approximately 4.9 ft/sec. This means the Elfe M can out-perform the R J 5 at lower speeds and the Jennie Mae at higher speeds. During the Internationals contest the Elfe M was said to have the highest wing loading of any plane in the meet. The figure has been given as 6.8 lbs/ sq. ft. which would lift its high speed performance even more. Not being an engineer nor a pilot I shouldn't question these figures. I merely point out they seem out of line to me.

The landing characteristics of a plane bears a close but not direct relationship to its minimum terminal velocity. This speed for the Breguet is 80 m.p.h. and indicates why it can land in a tiny field. This figure was erroneously given as 130 m.p.h. for the R J 5. I am sure I did not pull that figure out of a hat but Dick

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