and hadn't time to check the actual wind direction anyway.

Passed quickly over trees, a few scattered houses and then a small field. On easing the stick back to clear the trees on the far side of the field it became obvious that not enough airspeed remained so into the trees at approximately stall speed with a fair tailwind and 15' or 20' above the ground and with arms over my face to beat off branches and broken canopy. The right wing came off in the trees a few feet from the fuselage and spun the ship around to the right about 90°. The left wing dug in the ground and was torn off nearly like the right one. The ship continued around another 90° so it headed back the way it came and the nose dug in about 45° down and slightly over on the left side. Down came the tail and the silence was broken only by the crashing of rain on the wreckage.

A fast inspection combined with the releasing of safety belt and chute harness revealed no personal damage except for one completely broken left ankle, the result of planting the left rudder pedal in the ground. On raising myself to sit on the center canopy section I found I had fallen about 40' short of a road and it was a simple matter to crawl under the barbed wire fence. A car arrived almost immediately and we were off to Carrollton, a mile to the west, in less than 5 minutes after I hit the ground. Felt sort of silly sitting there in the car holding a boot full of loose foot by the boot strap.

Well, there's the story of how not to do it and why, complete with gory details and obvious errors outlined:



## NOTICE FROM OSTIV

### The Use of Artificial Horizons in Sailplanes

At the International Soaring Contest, Orebro, Sweden, 1950, a considerable number of sailplanes were equipped with artificial horizons for use in blind flight. This notice is offered as a warning to pilots of a behavior of artificial horizons which may lead to difficulties during blind flight.

All makes of artificial horizons are designed with a device called an erector, consisting of nothing more than a gravity pendulum similar in physical principle to the ball bank indicator. However, this pendulum does not force the gyro into the direction of the resultant acceleration immediately. It can overcome the gyroscopic movements only slowly. Nor does the pendulum always act in the vertical direction. In turns the erector acts exactly as the ball bank indicator: it, therefore, after a period of some minutes during spiralling, forces the gyro to indicate horizontal flight although the sailplane is actually banked. The erection rate of most gyros is around 4 degrees per minute when runing at normal speed. In a 30° bank the gyro will show horizontal again after 7.5 minutes. The Sperry gyro horizon is somewhat compensated for this effect but only for the standard airline approach turn. Since turns in a sailplane are much faster than air transport turns, the error above discussed will still be quite great.

When the wings are levelled to leave a cloud, a gyro, which has precessed into the apparent gravity direction (that of the ball bank) will indicate an equal and opposite bank to that which was maintained during the spiralling. After a length of time, dependent on the angle of bank and the erection rate, the gyro will return to the horizontal.

Now it is questionable whether such an instrument really furnishes useful information to a pilot in spiralling flight. He must know that he is banking at a fixed angle for at least a period equal to the erection time before he can be sure that the gyro indication is not transient. This he can know only from his rate of turn indicator.

This analysis does not hold for the indications of the gyro in the pitch axis. However, one feature must be considered. The usual gyro horizon has a pitch angular discrimination of 1°. A sailplane can accelerate quite quickly with a 3° change in pitch angle. Therefore in order to control the speed by means of a gyro the pitch angle must be controlled to very close limits on the gyro scale.

A gyro can be compensated for turning error completely, but only some very expensive models are so refined. A Swiss firm, Peravia, has begun on this problem of designing a gyro horizon specifically for soaring. This unit would have turn compensation and a sensitive pitch indicator. Until this instrument appears it would be well for soaring pilots to bear in mind that their gyros tell a false story under spiralling conditions. Some evaluation of the weight and energy requirements in terms of the doubtful information offered by the gyro should also be made by the individual pilot. Each pilot may convince himself of the falsity of the gyro by spiralling in clear air for at least ten minutes; on levelling out he will note the amount the gyro was in error during the spiral.

AUGUST RASPET
Scientific Section Chairman.