

Sailplane INSTRUMENTS and Their Arrangement

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At this year's national contest, we shall see more sailplanes than ever before. That means we shall also see more sailplane instruments, because the best soaring craft are of little value without specialized aircraft instruments to guide their pilots. The number of these delicate recording mechanisms deemed necessary for high performance soaring has steadily increased in recent years so that the twin problems of choice of instruments and their proper placing on the instrument board have become really important.

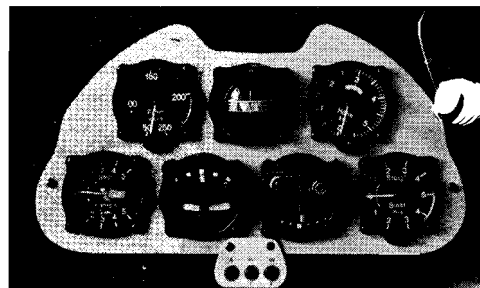
For maximum performance of a modern sailplane, most pilots agree that at least six instruments are necessary. These, in the order of their importance, are: variometer, altimeter, air speed indicator, turn and bank indicator, compass and clock. Some pilots may argue the relative importance of the turn and bank, the air speed, and the altimeter, but all will agree that the most essential is the variometer.

Variouly named as a sensitive rate of climb indicator, and vertical speed indicator, the variometer registers the rate of climb or descent on a scale calibrated in feet or meters per second. There are two types, the usual one with round dial and operated with a fixed leak and using a thermos vacuum bottle and the other, the liquid type, registering on a vertical scale. The best known makes of the former type are the Kollsman Vertical Speed Indicator calibrated in feet per second, made in this country, and the Askania, Horn and Winter, calibrated in meters per second, made in Germany. The former instrument was used with great success by Harland Ross in the RS-1 at last year's contest and by John Robinson in the "Robin" during his recent altitude flights in California. Emil Lehecka has an Askania in his "Sperber" and the Horn is installed in Richard duPont's and Chet Decker's Minimoes, as well as in the new Ross sailplane of the S.S.A.

The outstanding variometer of the liquid type seems to be the Cobb-Slater, which is made in England and distributed in this country by the Schweizer Metal Aircraft Company, well known manufacturers of metal gliders and sailplanes. It consists of two vertically mounted glass tubes with a scale calibrated in feet per second between them. A green ball in the left tube registers ascent and a red ball in the right tube registers descent. This instrument is in Sanborn's Grunau 8 and in the Y Flying Club's Kestrel. Its manufacturers claim negligible lag and robust construction. The question of lag, often quite pronounced in the cheaper variometers, can be quite serious and spoil a pilot's chances in competition.

The altimeter, extremely useful for distance as well as altitude flights, is a simple instrument consisting of an aneroid barometer. Most German altimeters are calibrated in hundreds of meters, but the American pilot, unused to the metric system, finds he really needs one calibrated in thousands of feet, despite the fact that he may prefer a variometer reading in meters per second. The very best altimeters are of the sensitive type developed for aeroplanes with a long hand indicating hundreds and a short hand indicating thousands of feet. They are manufactured in this country by Kollsman and Pioneer, in Germany by Askania. Although the sensitive altimeter is desirable, very satisfactory results can be obtained by using the simpler and less expensive single hand altimeter of which there are numerous makes. One objection to the sensitive type in sailplanes is that lacking engine vibration, it is frequently necessary to keep tapping the instrument to obtain an accurate reading when changing altitude rapidly.

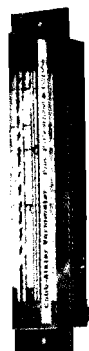
The airspeed indicator, which has become more useful than ever with the cockpits becoming entirely enclosed, is a simple instrument usually actuated by the Pitot-static tubes similar to those used in powered aircraft. With the hand recording the difference in pressure between air blown into one tube and that sucked out of the second tube, the dial is calibrated from 20 to 150



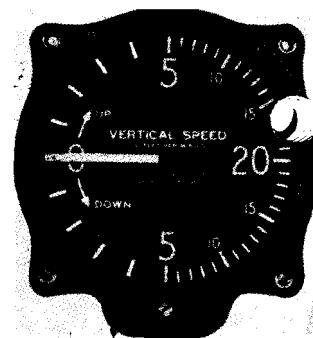
Minimoo. Upper Row—Airspeed, Compass, Altimeter. Bottom Row—Variometer, Turn and Bank, Electric Turn Indicator, Variometer.



Another Minimoo, showing on left Inclinometer; bottom, Compass and Altimeter



Cobb-Slater Variometer



Kollsman Vertical Speed Indicator

kilometers per hour or 50 to 250 km./hr. in the case of the German Bruhn air speed indicator. This instrument is also obtainable from Pioneer, Kollsman, and Askania reading from 20 to 90 m.p.h. and upwards. It is essential for cloud flying.

Now we have the turn and bank indicator, not essential unless you are going to do cloud flying, but extremely useful at all times in perfecting a smooth technique of circling in thermal upcurrents. The type in common use has been one with the gyroscope driven by means of a large venturi mounted outside the ship. Several objections to this type, such as the aerodynamic drag of the venturi, and the likelihood of clogging from condensation and ice while cloud flying, has led to the designing of an electric turn indicator run from dry cell batteries of approximately 12 volts. This instrument, developed by the famed Siemens concern in Germany, is well illustrated in the