• *Effects Of Altitude*

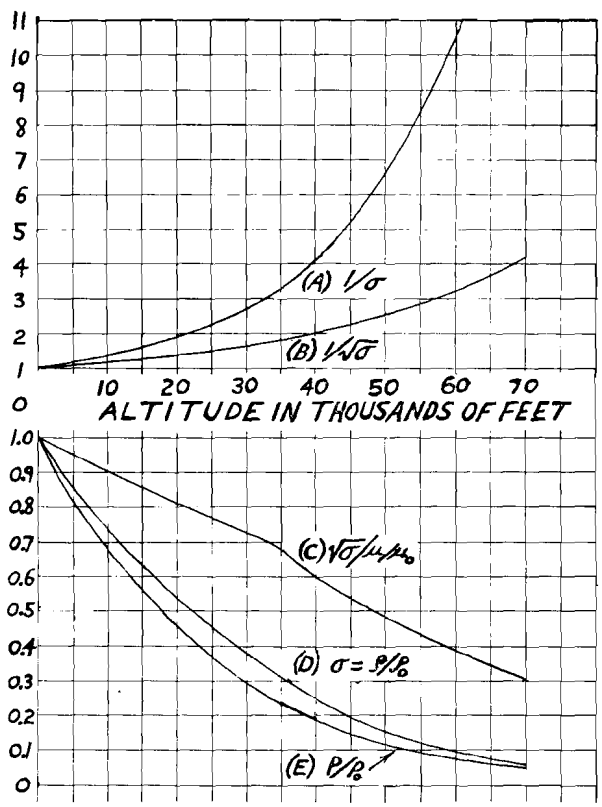
(Continued from Page 2)

airspeed. To obtain the true sinking speed at any altitude from the sea level polar, we must multiply by $1/\sqrt{\sigma}$ just we did the indicated airspeed to get the true airspeed. This fact informs us that the glide ratio at a given indicated airspeed is constant with altitude. Glancing back at curve B we find that ascending currents have to be 2 and 4 times as great at 40,000 and 70,000 feet respectively as those required to maintain zero sink at sea level. At the present low minimum sinking speeds of sailplanes together with the strength of the Bishop Wave, it would not seem that this is a serious limiting characteristic.

Although turning performance may not be as critical for Wave soaring as in Thermal soaring, a few comments may not be amiss. The steady radius of turn varies directly with the square of the true airspeed and inversely (approximately) as the normal load factor which is dependent upon the lift coeff. and dynamic pressure. If we neglect second order Reynolds and Mach number effects on the maximum lift coeff, the maximum normal load factor is constant with altitude at a given indicated airspeed. **However, the square of the true speed is increasing as $1/\sigma$ and so the radius of turn goes up rapidly with altitude. Curve A shows it doubling at 21,000 feet and becoming 10 times as large at 59,000.**

The decrease in atmospheric pressure with altitude is shown on curve E. For high altitude flights, designing the canopy and cockpit (if pressurized) for a differential pressure equal to the full sea level atmospheric value is indicated.

Summing up then, we can say that the soaring pilot can use his airspeed indicator at high altitudes in the same manner as he does at sea level. The speeds for stall, best glide, and structural placard will retain their sea level values at altitude. He can also expect his still air glide ratio to remain constant with altitude. The still air sinking speed will go up moderately and his steady turning radius rapidly. Finally, he must be on guard for the onset of compressibility effects at high indicated airspeeds as he reaches the upper limits of altitude treated in this study. Who would be so rash as to say that in the forseeable future the sailplane will not capture the absolute altitude record for aircraft? This conjecture is, of course, limited to that class of powered aircraft which obtains its oxygen supply from the atmosphere.



Soaring Calendar

APRIL 15th
Texas Soaring Assn., Kite Contest
GRAND PRAIRIE, TEXAS

★ ★

MAY 27th THRU 30th
Wright Memorial Contest
DAYTON, OHIO

★ ★

JUNE 29th, 30th, JULY 1st
Midwest Soaring Contest
TOLEDO, OHIO

★ ★

JULY 3rd
SSA Directors Meeting
ELMIRA, N. Y.

★ ★

JULY 4th THRU 12th
18th National Soaring Contest
ELMIRA, N.Y.

★ ★

JULY 8th
Governors Conference
ELMIRA, N.Y.

★ ★

AUGUST 19th THRU 26th
3rd Southwestern Soaring Contest
GRAND PRAIRIE, TEXAS

BACK COPIES

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• *Peravia Barograph*

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their barograph and to facilitate the importation of such instruments. Mr. E. J. Reeves of Dallas, Mr. Pat Mulloy of Laurel, Mississippi and the author have Peravia barographs which they will demonstrate to any interested sailplanist.