

HOW-TO-DO-IT

GETTING THE MOST OUT OF YOUR CALCULATOR

by J. S. IRVINE

In addition to the time-distance problems usually solved on a calculator or circular slide rule, there are several other elementary applications which should be known to every cross-country sailplane pilot.

It will tell you your L/D with any headwind or tailwind and will show you how much the average downdraft will affect this ratio. Perhaps the most useful application is in determining how far you should glide from any altitude with any given L/D.

Let us consider the L/D ratio first. Your variometer probably reads in hundreds of feet per minute. 100 feet per minute is very close to 1 knot. 1 knot is 6080 feet in 60 minutes or 101.3 feet per minute. Now, if you know your airspeed in knots, all you need do is divide by the vertical speed in knots to obtain your L/D. It just happens that your indicated airspeed in mph is quite close to your true airspeed in knots on a normal summer day at normal altitudes. If you want to be a little more accurate you should subtract 2 from your indicated airspeed at 5,000 feet for speeds up to 65 and 3 for higher speeds to give you your true airspeed in knots. This is assuming temperatures to be 15 degrees Centigrade above standard. At 10,000 feet you should add 2 for speeds up to 75 and 3 for higher speeds. Before you start doing this, though, you should also have an airspeed calibration and a variometer correction for different altitudes. So, for practical purposes, just use your indicated airspeed and indicated sink. After all, we are not trying to draw performance curves; we are just trying to get some useful indication of our L/D.

Suppose that you are indicating 65 mph and your variometer indicates 250 feet per minute down. What is your L/D? See Fig. 1. Set 25 (2.5 knots) on the inner scale under 65 on the outer scale and above 1 on the inner scale read L/D on the outer scale as 26 (to 1).

This assumes still air. How will the wind affect us? Let's rework the previous problem with a 10 knot tailwind. See Fig. 2. Set 26 on the inner scale under 65 on the outer scale. Now under 65 plus 10 or 75 read your L/D of 30. For a 25 knot tailwind, under 90 (65 plus 25) read 36. For a 10 knot headwind, under 55 (65 minus 10) read 22. For a 25 knot headwind, under 40 read 16. If you are figuring your L/D from your airspeed and sink, you can take account of the wind by simply applying it to your indicated airspeed before dividing by your sink.

How do downdrafts affect our L/D? Suppose our sailplane has an L/D of 26/1 in still air at 55 knots. How much will an average downdraft of say 50 feet per minute affect this ratio? See Fig. 3. Above 1 on the inner scale set 26 on the outer scale. Below 55 on the outer scale read 21 (210 feet per minute) on the inner scale. Reset 210 plus 50 or 26 (260) below 55 and above 1 on the inner scale read the new L/D of 21 on the outer scale.

How far will you glide from any altitude above the ground at any L/D? Suppose you have figured your L/D with a tailwind as 31/1. See Fig. 4. Under 52.8 (5280 ft. = 1 mile) on the outer scale set 31 on the inner scale and then read miles on the inner scale under thousands of feet on the outer scale. For in-

stance, 2700 feet; 16 miles, 3900 feet; 23 miles, 6600 feet; 39 miles, etc.

Suppose you are climbing in a thermal 25 miles from your goal and you want to know how high to climb in order to reach your goal at 700 feet with an L/D of 28/1. Set 28 on the inner scale under 52.8 on the outer scale. Above 25 on the inner scale read 47 on the outer scale. You should climb to 5400 (4700 + 700) feet above your goal.

CALENDAR PHOTOS NEEDED

The SSA Publications Committee plans to publish a wall-type calendar for 1960 which will feature one large photo of a different sailplane for each month. This is a general solicitation for black-and-white photos to be used in this calendar, preferably in-flight, close-up shots printed 8" x 10", although smaller prints will do if they are sharp enough.

In general, it is planned to include one each of the most popular and noteworthy sailplanes in this country. A tentative list follows:

2-22C
1-23 series
1-26
1-29
HP-8
BG-12A
R-6
L-K
TG-3A
Ka-6BR
Cherokee II
Prue Two

These are not necessarily the ones that will be used and if any reader feels that some other sailplane should be included he is invited to write in and say so, preferably enclosing a photo of what he has in mind.

Contributors of photos actually used will be given a free copy of the calendar and it is hoped that most will allow their photos to be kept for possible use in SOARING magazine.

