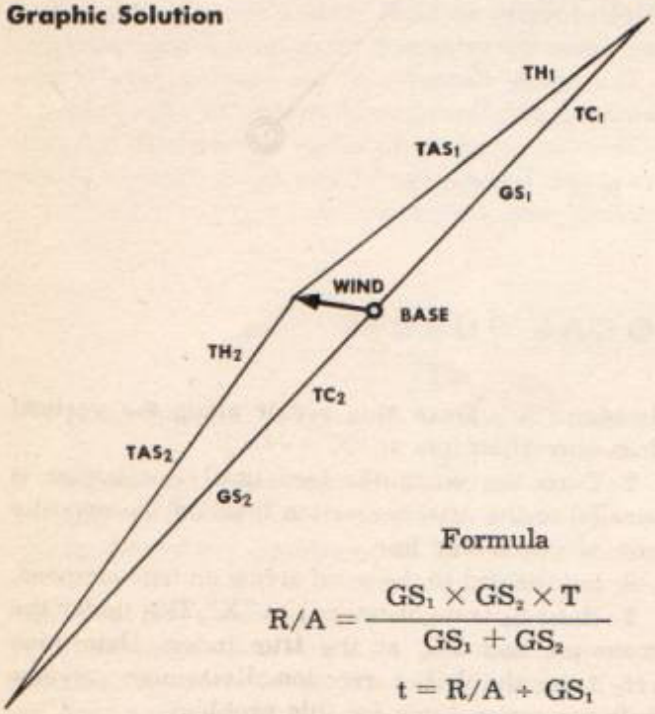
RADIUS OF ACTION

Know both graphic and computer solution

RADIUS OF ACTION SAME BASE

You are trying to find the maximum distance you can fly along a given course and still return to your base with a reserve of fuel.

Graphic Solution



Formula

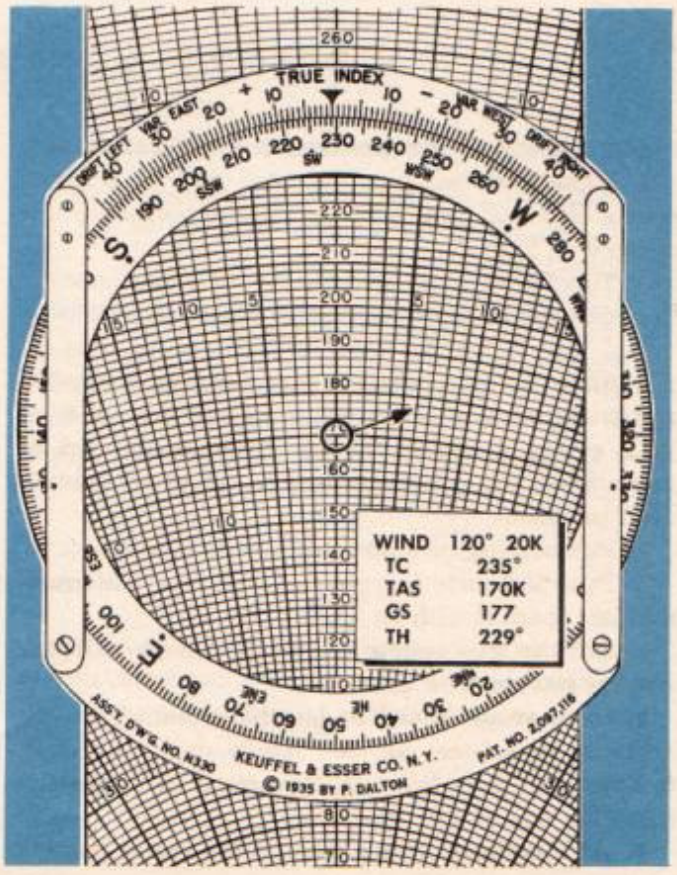
$$R/A = \frac{GS_1 \times GS_2 \times T}{GS_1 + GS_2}$$

$$t = R/A \div GS_1$$

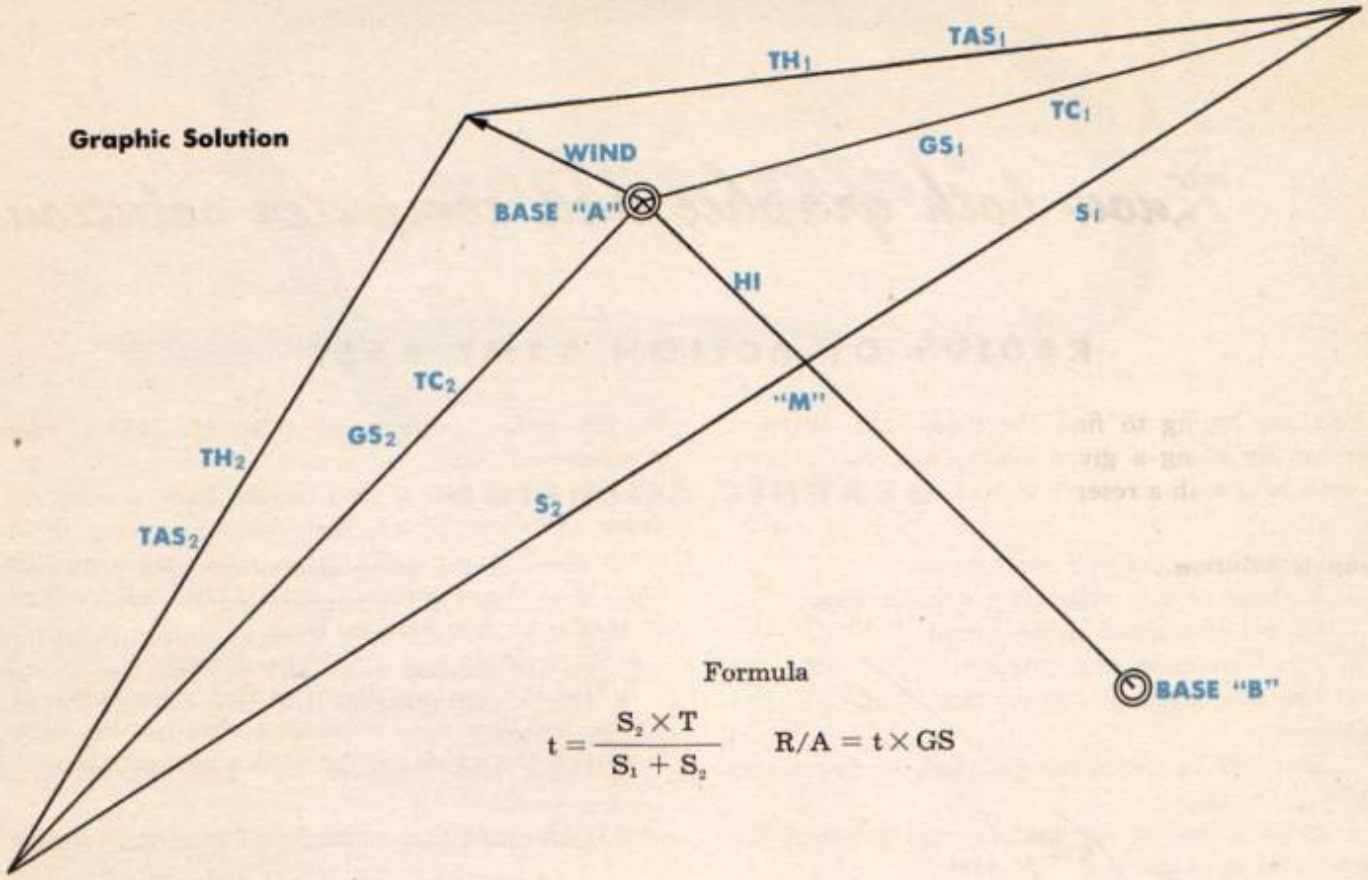
R/A is the distance on the course out, T is total fuel hours available less 25%, t is time on course out, and GS_1 and GS_2 are groundspeeds on the course out and the course back respectively.

Computer Solution

1. Place the wind on the computer in the usual manner, down from the grommet.
2. Place the grommet on true airspeed.
3. Place patrol course at true index, and adjust or juggle your computer to obtain true heading.
4. Knowing true heading, true airspeed, and intended course, obtain groundspeed. This is the groundspeed out.
5. Knowing that if you depart from a base, in order to return to the same base you must fly a reciprocal of the patrol course, rotate the computer 180°. With the reciprocal course at true index adjust or juggle for true heading back.
6. Now obtain the groundspeed back.
7. Use the formula above to find your radius of action, and time out on course before turning back to base. If the winds change work a new problem.



RADIUS OF ACTION ALTERNATE BASE



Formula

$$t = \frac{S_2 \times T}{S_1 + S_2} \qquad R/A = t \times GS$$

The solution to this problem tells the following:

1. Maximum distance you can patrol a given course and still return to an alternate base with a reserve of fuel.
2. Time to turn on heading for alternate base.

Computer Solution

1. Since in this solution you read groundspeed and track on the center vector, place the wind on your computer down to the grommet instead of down from the grommet as you do when solving drift problems.
2. Put bearing of alternate base at true index.
3. Put the hourly increment down from the grommet and mark it with an "X".
4. Put the true course under true index with the wind arrow on true airspeed.
5. Read groundspeed under the grommet and S_1 (rate of departure) at "X". Apply drift correction to determine true heading. Reverse drift correction signs for use in this problem.
6. At this same setting draw in the vector passing through "X". Draw this vector along the vertical drift correction line at "X".
7. Turn the computer face until this vector is parallel to the drift correction lines on the opposite side of the center line.
8. Set the end of the wind arrow on true airspeed.
9. Read S_2 (rate of return) at "X", GS_2 under the grommet, and TC_2 at the true index. Determine TH_2 from the drift correction. Remember: reverse drift correction signs for this problem.
10. Determine t (time out on course) and radius of action from the formula.

This method of solution is not intended to replace the Mercator or graphic solution. It is to be used as a quick and rapid check once you have completed the graphic solution.

Remember:

If you ever operate from an aircraft carrier, remember the carrier is moving from departure to the position designated as alternate base. You can turn to TH_2 at any time before your radius of action is completed, and you will intercept the carrier.