

and resume spiralling. Now this sounds good on paper but requires a lot of practice. The figures are good for only one set of conditions.

If you start hitting "red" air, or uneven "green" air, it will be necessary to shift the spiral into the stronger lift. By experience, it will be found the corrections are made into the wind.

Figure 1

Suppose you hit red air at D and it continues around E to KF where you hit green air. Remembering the arc DEF as 180° we know that at F we are heading toward the thermal and roll out at F fly straight for two seconds and resume spiralling at H. You must know your heading at all times from some reference point such as the sun, a mountain, cloud or landmark. The compass is of no use when spiralling.

Figure 2

Take the case where we come out of the thermal at J and reenter at K. Continue the spiral LJK and at M straighten out for 1 second and resume spiralling at N.

Figure 3

In the case where we hit red air at P and it continues 270° to R, we should continue our spiral PQ and at S straighten out for 3 seconds and resume at T.

This, however is an unusual case because most of the time we will have the second case to cope with and immediate corrective action will put you in even lift throughout the spiral. A complete understanding of these principles and a patient instructor should enable a novice to center thermals after a few hours of dual. All this presumes the pilot can fly coordinated turns at a constant airspeed and bank which is not simple in thermal turbulence.

Thermals have been successfully flown by alti-

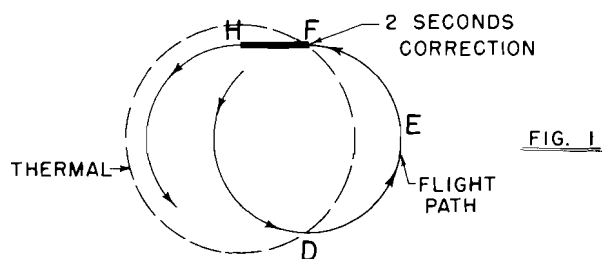


FIG. 1

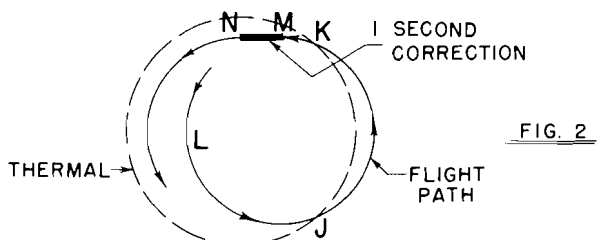


FIG. 2

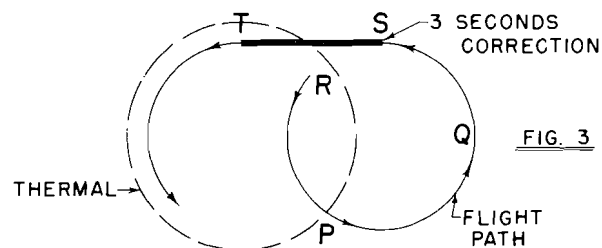


FIG. 3

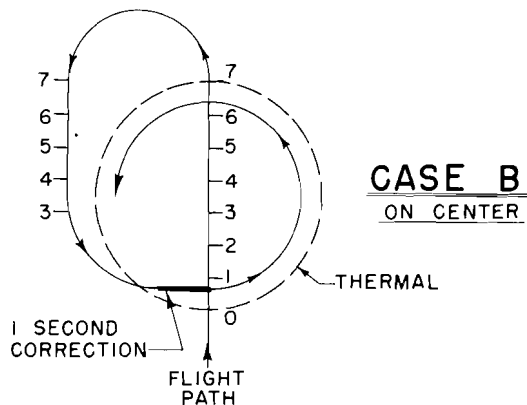
meter alone, but this makes it unnecessarily difficult. A good pellet or vane variometer are recommended as vertical speed instruments. I have found pellet types easily adapted to installation on the inside of the canopy in the line of sight so that the readings can be made on airplane tow. This is a great advantage over an instrument panel installation because you do not have to look down into the cockpit. A turn and bank indicator will tell you if your turns are coordinated and efficient and also give you a check on your rate of turning. A piece of yarn tied to your pitot mast or a balanced balsa vane will also check yaw and inform you of inefficient flight.

Many times a thermal will weaken in strength but if you continue spiralling in the same area it will pick up again. Newly forming cumulus are indicators of thermals if allowance is made for wind drift and the life cycle of the cloud thermals will bend many times before they mushroom out and sometimes they even bend over horizontally into "rolls." This is a relatively unexplored field in soaring. Thermals always rotate and when they bend over horizontally they form "rolls" whose direction is roughly perpendicular to the wind.

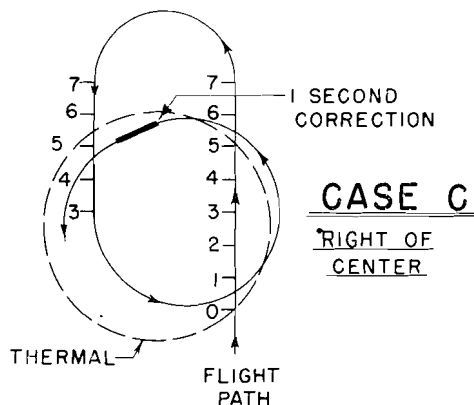
On encountering a "roll" you alternately hit lift and sink each 90°. The problem is then to visualize this rotating cylinder and fly a course that goes through the lift areas. Experiment with compass courses until you can stay in the lift and when you drop out the end of the roll do a 220° turn that should bring you to intersect the lift area and correct 40° to establish the reciprocal compass course. I have found rolls from 10 seconds to 10 minutes long in the Mojave desert.

In conclusion, this geometric method of locating

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CASE B  
ON CENTER



CASE C  
RIGHT OF  
CENTER