

Yet one more view of the cover subject. Length of that centre nacelle is 4 in. but it completely accommodates the CO₂ flight capsule and power unit as well as a scale pilot, gun and dummy engine. Total weight of the model is little more than 1 oz.!

the longest run* of the lot was achieved in a fourth charge (over 200 seconds). The nearest to it was 185 seconds from the second charge of the series of runs on chart 1.

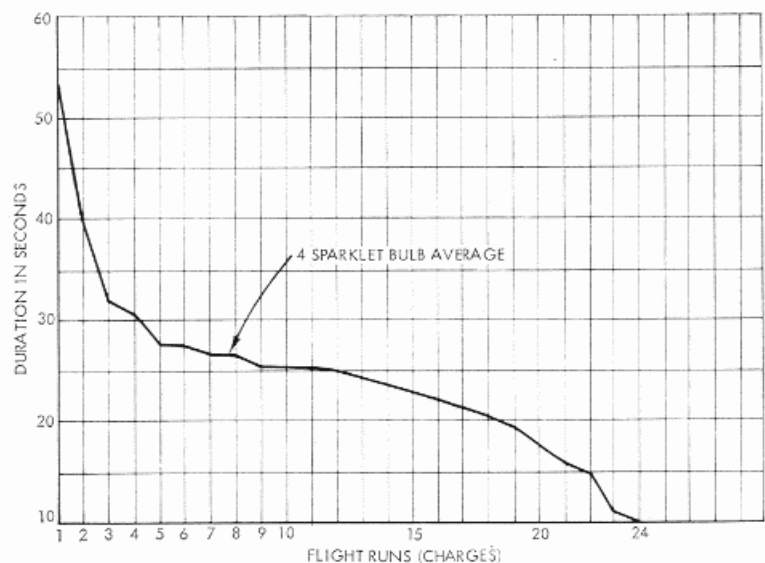
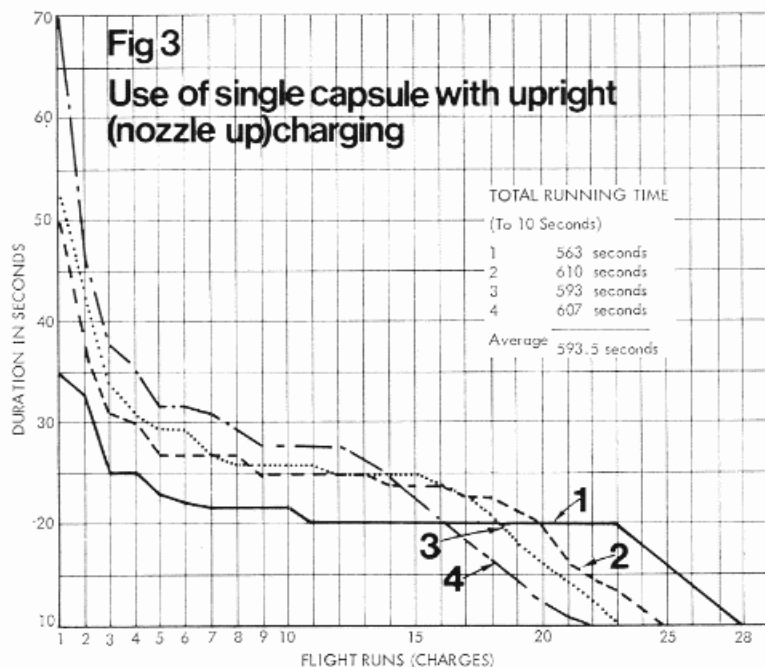
Using this mixed upright/inverted charging system a series of tests was carried out and on each succeeding one, two more runs were made with the bulb upright before inversion for the rest of the tests. Eventually, the point was reached when inversion had no effect on the expected *gas charge* time, thus indicating that only gas remained in the Sparklet bulb at this point.

All the engine runs from which the charts in this article were made were at similar setting with the same propeller and in uniform temperature conditions.

If the model will carry an extra 3 grammes, there is another way to achieve even more usable engine running time, and that is to use *two* standard flight capsules joined together by a short length of thin copper tube. The doubling of the flight capsule volume gives much longer runs and even a gas charge can give a whole string of usable engine runs from one Sparklet bulb. Bulb 1 on chart 5 (gas only charges) gave no less than seven 80-second runs and one 110-second run.

The twin flight capsule can also overcome another problem—that of trim change, resulting from the weight of a liquid charge. There is a two-gramme difference between a charged and uncharged single flight capsule (liquid), but a gas-only charge produces no measurable weight increase. However, a *liquid* charge in a twin-capsule installation will add not only the three additional grammes of the extra capsule, but also four more grammes of liquid gas. It is an important

* From a single flight capsule.



factor to consider when capsule positions relative to the C.G. are being laid out.

These studies clearly show the measure of control that can be exercised over the engine run by means of various charging techniques.