

INTRODUCTION

YEAR by year, this page has chronicled a reflection on achievement trends and changing habits in the world of aeromodelling. Anyone lucky enough (and we really do *mean* lucky enough) to own a whole set of *Annuals* since the first one appeared in 1948 will possess as fine a record as can be found anywhere of aeromodelling progress in technique and design. One can browse for hours in back editions. Discover inventions now forgotten, revise ideas that have gone dormant, note how forecasts have come true and study the ever-changing shapes of models as well as the modern "knock-offs" of much earlier designs.

There have been vintage years filled with a bonus of achievement and there have been negative years which many prefer to forget.

Alas, this past season comes into the latter category in some respects. It has seen a mischievous lobbying within the Society of Model Aeronautical Engineers to cancel progressive efforts to run a World Indoor Champs and International pylon event. It has seen insurance houses raising their rates for third party cover to many times the previous premium. It has seen the organisers of three World Championships hard pressed to find funds in spite of a 50% increase in entry fees and, worst of all, the year 1972 has produced the coldest, wettest, windiest succession of Sundays within memory.

Yet the modellers smile their way through all of this. Fantastic records have toppled old figures. Over 19 hours aloft with a glider; almost 2 hours with an indoor model; 72 minutes with a helicopter, and as for speeds—well, they are so fast that the F.A.I. has to seek ways of rationalising methods of timekeeping to cope.

We have seen new ventures in scale modelling with yet more "impossible" subjects becoming very much possible with the aid of radio control. Pylon racing has risen in popularity to the extent that, like combat in control line, the entry into events has to be restricted or subjected to eliminators in order to cope with the numbers.

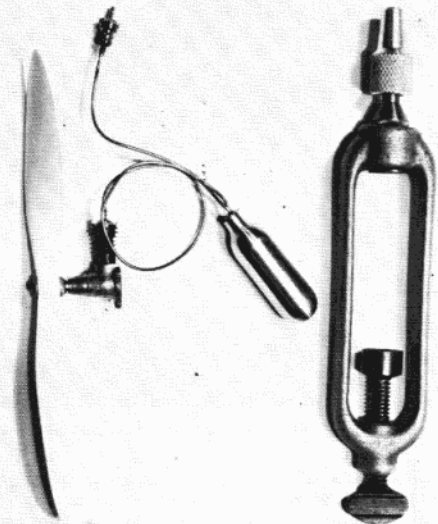
Electric flying, both round the pole in our *Model Engineer* exhibition and outdoors (see feature in this *Annual*), has come within the reach of everyman, and the following for thermal soaring has also gone ahead by leaps and bounds.

This year our theme might well be titled "*The Silent Revolution*" as a summary of our contents. Why not strike out for more silence—more hush will crush the aggressive anti-model-flying militants. We have Doug McHard's masterly treatment of the Brown Junior CO₂ motor as our main feature. These little units, made by Bill Brown in his "retirement" to the Pennsylvania hills, are hard to come by, but we feel they need to be known if only to inspire others to venture into manufacture. Doug evades the cost per flight. We suspect he does so because CO₂ is almost embarrassingly cheap to operate! Then we have a Winkler thesis on F1E, or in other words the International class for magnet steering gliders. In Europe this kind of model has a huge following. British hills cry out for magnetees. 1972 also seemed to be "airfoil" year. Our offices had more enquiries for airfoil data than is customary. This edition should have enough to satisfy the most demanding of airfoil collectors.

Finally, the hard world of commerce has snared us with yet another price increase. Over the past three years, the *Annual* has seen a progressive cover price increase to the extent that this edition has to be sold at almost twice the price of all those *Annuals* from 1948 to 1969. This inescapable increase is a reflection on an aspect that affects all walks of life, and one which we endeavour to temper in this *Annual* with an increase in the number of pages to 144. We hope you'll enjoy every single one of them.

EXPERIMENTS WITH CO₂

by J. D. McHard



The complete Brown CO₂ unit, as produced by Bill Brown of Brown Junior Motors Inc. (P.O. Box 77, Pine Grove Mills, Pa. 16868, U.S.A.) in limited numbers. Older readers will know that Bill Brown was the pioneer of internal combustion engines used in quantity for aeromodelling. Photograph is approximately half size. Cost of the unit is in the region of £10 (depends on international exchange fluctuations).

THE CO₂ to drive the engine is stored in a little aluminium flight capsule, which may be recharged several times from a steel Sparklet soda syphon bulb, which is bought from your chemist in boxes of 10.

The process of charging is very similar to that adopted for refilling a gas cigarette lighter (although of course the gas itself is quite different!). It is interesting to study the behaviour of a liquefied gas in certain clear plastic lighter refill cartridges, since it will make the reasons for many of the following phenomena more easily understood.

With this understanding, a good measure of control can be exercised over the number of recharges obtained from each Sparklet bulb and over the duration of the resulting engine runs.

If the flight capsule is charged from a Sparklet bulb held nozzle **down**, liquid CO₂ flows into the small flight capsule; this we will call a *liquid charge*. If, on the other hand, the Sparklet bulb is held nozzle **up** during charging, the flight capsule will receive little or no liquid—only gas, and a much shorter engine run subsequently results. In the following pages we will refer to this as a *gas charge*.

Gas connections between flight capsule and engine should be arranged so that no liquid CO₂ reaches the engine. The flight capsule connection must therefore be arranged from the highest point, although the engine may be mounted in any position relative to the capsule.