They belonged to an era of engineering concepts, used classic structures, were large, difficult to manage, and wholly influenced by the coincidence of a place to fly, people to assist, and perfect calm. The frequency of these three Ps was something like 7 in 365, and the situation was not helped when Dr Paul MacCready created the filmy flyweight Gossamer Condor for Californian desert conditions. Even so, MacCready was to discover the hard way that the RAeS rules for the figure of eight course around two markers half a mile apart were more demanding than ultra-low wing loading and three Ps would guarantee. It was not until recruitment of powerful cyclist Bryan Allen, and the solution of control in turns with a float-ing foreplane and warp drag, that the Condor could be persuaded to remain airborne around the course on August 23, 1977. The flight took 6min 22-5sec and was unrepeatable—by Condor that is. But the £50,000 Kremer prize was won, and a new target was set through the generosity of this patron of man powered flight.

The largest ever cash prize in the history of aviation was deposited with the RAeS by Henry Kremer for the first to fly from England to France. Again MacCready succeeded, largely through his natural will to win through bold experi-ment, but also by his extraordinary ability to coalesce likeminded free-thinking enthusiasts. Bryan Allen's 2hr 49min crossing from Folkestone to Cap Gris Nez on June 12, 1979, won the £100,000 sur-prisingly within two years of announce-ment. Of the many Kremer prizes, there now remained three: £1,000 for the first British entrant to make a flight greater than 3min duration, £5,000 for flight around a slalom course within the British Commonwealth, and the second prize for completion of a figure of eight, restricted to non-US citizens, of a further £10,000. Activity dropped to a low ebb following the euphoria of MacCready's successes. He turned to Solar Powered flight, while the Gossamers rested on their laurels in museums. In the RAeS commit-tee thoughts turned to termination of the duration and slalom awards, and to a deadline for the figure of eight event.

Speed was to be the new challenge and, with it, a move to smaller, more practical and transportable aircraft, less sensitive to gusts and capable of 20 m.p.h. Rules were set for a 1,500m triangular course. Henry Kremer responded magnificently with another £100,000, of which £20,000 would go to the first to cover the circuit in less than 3min and £5,000 to each subsequent entrant improving the speed by at least 5 per cent. As a further chal-lenge to ingenuity, the pilot(s) would be permitted to store energy in the lOmin immediately before crossing the start line. Catch 22 lay in the rule which required that the system be "uncharged" before the storage period. Elastic, compressed air, or flywheel devices were easy to observe. Electrical storage using NiCad batteries posed unforeseen problems both for the first claimant, MacCready, and for the RAeS. Expert consultancy within the industry and Farnborough resolved these

Rochelt's Muscutair makes its prize-winning figure eight flight in the sunset at Neubiberg on June 19

difficulties, but not without frustration for
the team which produced Gossamer Swift,
the first to beat the 3min target.

Bionic Bat

Response to the Speed Competition
came quickly from Japan, Australia, Germany, Switzerland, and the UK. It also revived old trans-USA rivalries between the Massachussets Institute of Technology (MIT) on the East coast and MacCready in California, not unlike the healthy challenge between Hatfield and Southampton 20 years earlier.
Gossamer Penguin, a scaled-down version of the Albatross first intended as a smaller, faster cross-channel project, had flown on solar power with electric drive. From it, with vital experience, emerged the 42ft Swift.

Initially equipped with three Astro Challenger 40 cobalt motors—two for propulsion and one as a generator—and a

24-cell l,200mAh Sanyo pack, the Swift was test flown at Shatter under a full moon, and was consequently rechristened the Bionic Bat. It grew to 50ft span with styrene extensions, and after two months of training and consecutive camping-out weekends, Parker MacCready completed the course in 2min 38-69sec on September 25,1983. When a dossier was submitted, it included observation that the team had chosen as a "Zero" the condition of 30V for the 24 cells in series, as measured when drawing 1 • 0A. This was not acceptable as "uncharged", and to clarify the issue, the RAeS issued a special instruction for a discharge and shorting procedure to reduce NiCads to a zero threshold.

MacCready removed the storage system
pending attempts on human power alone,
but competition from MIT was keen, and
a new auxiliary drive with one Astro 40
and 16 cells was devised, while the outer
wing panels were rebuilt to increase span

MIT's Monarch has an aluminium-tube fuselage frame and main spar and nearly 300ft of external bracing wire

FLIGHT International, 16 March 1985