Behemoth started life as an experiment with circular wing ornithopters. [ out of sheer curiosity ]. This evolved into the present wing planform on the current Behemoth [Behemoth 3 ]

BEHEMOTH DESIGN AND CONSTRUCTION

Wingspan  27 inches  
Length     20 inches  
GW         55 grams  

WING EVOLUTION
Behemoth’s 1 and 2 had ‘almost circular’ wings and fixed trailing edges. [ ie: The wing centre section trailing edge was attached to either the fuselage or a wing mount ]

This combination didn’t appear to produce sufficient thrust so the wing planform on Behemoth 3 was changed to include the outboard wing extensions and the trailing edge is floating free. This will [ I hope ] increase both the thrust and the lift.
CONSTRUCTION

WING
Tapered balsa spar curved aft outboard. EPP foam leading edge 'D' section. Flat carbon strip wing root. Wing membrane is tissue.

FUSELAGE
Pink 1/2 inch wallfoam cut, shaped and hollowed out to minimize weight as much as possible.
Tailboom is composed of 2 carbon rods epoxied into the foam.
FLAPPING MECHANISM

The flapping mechanism consists of a conrod [balsa], vertical slider [carbon tube and wire] and guide [plastic tube] and 2 wing spar sliders [carbon rods]. This arrangement gives symmetrical flapping.
MOTOR AND GEARBOX
The gearbox is homemade, 2 stages with 19.2 to 1 ratio. I used plastic gears, carbon tube shaft, brass tube bearings and balsa and plywood for the case.

The motor is a small electric motor removed from a toy.

RADIO CONTROL EQUIPMENT
The radio receiver, lithium ion battery and combination switch/charging jack were removed from a toy rc aircraft [Atomic Toy's ZPlane]

The radio control was connected to the throttle only for initial tests.
FLIGHT TESTING

Glide tests were performed first. There was no tendency to roll or yaw. There was, however, a tendency to pitch down. Flight testing was at full power and did not last long!! I attempted to adjust the CG aft to reduce the pitch down problem and had noticed some improvement. Unfortunately, Behemoth landed nose first, jammed the flapping mechanism and stripped 2 teeth on the stage 1 gear. So ends Behemoth's flight tests.

A landing gear is now being installed with the intention of conducting some ground testing.

Behemoth 4 is now under construction. There have been many design changes which will be detailed in 'Behemoth 4 Design Notes'

This interesting moth was sitting at our front door today. It has a similar wing planform to Behemoth. Note the scalloped trailing edges.

Patricia Jones-Bowman