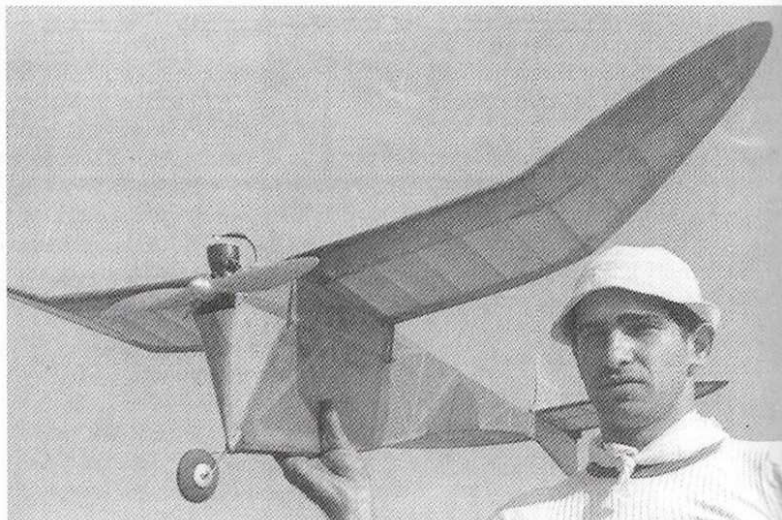


Leon Shulman's Banshee

Alex Imrie discusses the design pedigree and lightning performance of this vintage classic

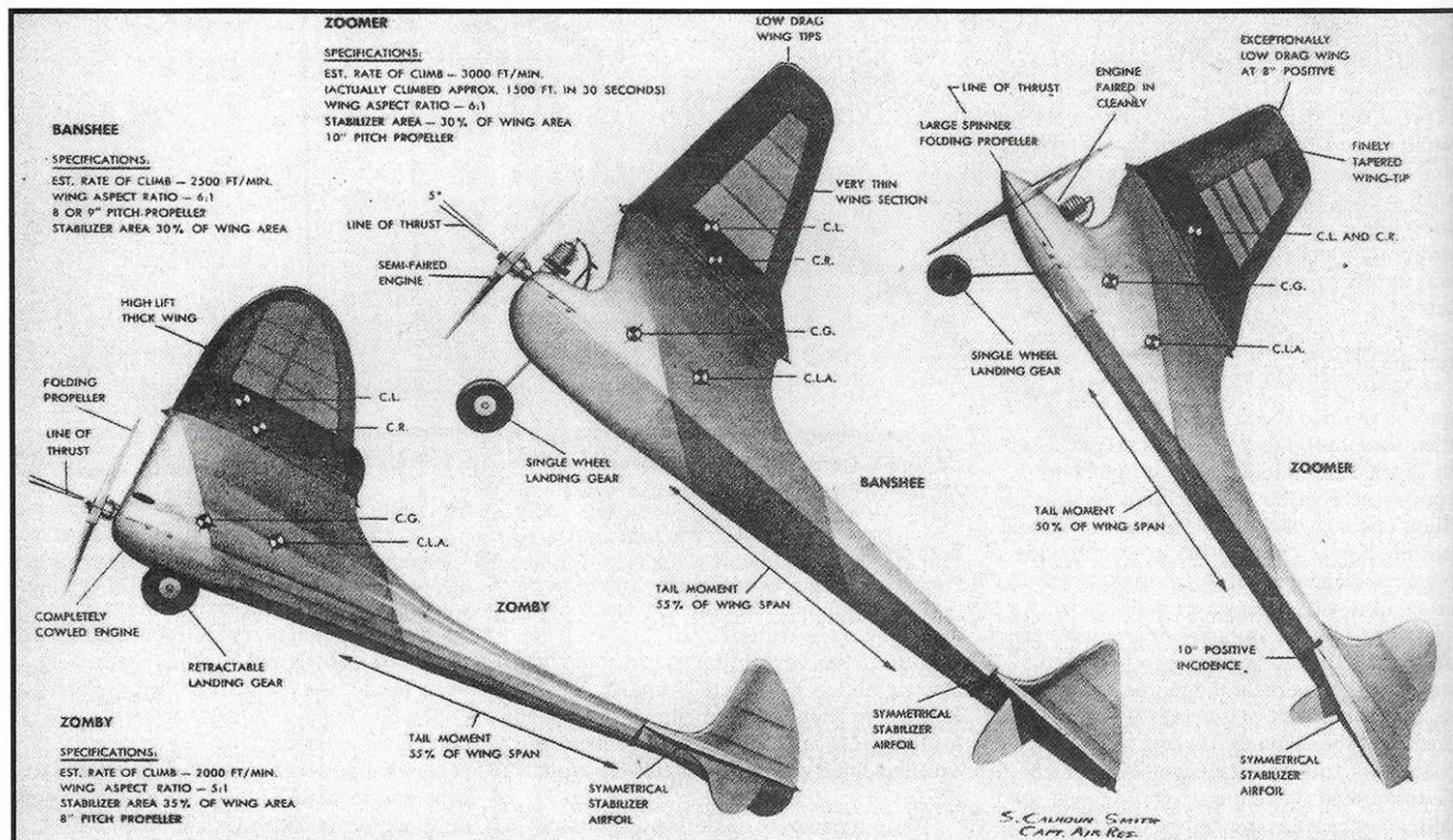
With the upsurge in power model flying in this country after the war it was soon apparent that the following of the semi-scale model was losing its appeal. Despite the writings of staunch supporters for a model that should look like a real aeroplane, the thrill of high performance attracted many and caused them to support the power duration type of competition - the emphasis was on climbing ability coupled with a very flat glide and the model that really made an impact here was Leon Shulman's Banshee. This was not a new design having been developed in 1941 in the midst of Shulman's earlier design successes with his Zomby of which he made 17 models in various sizes that placed highly in the 1941 contests - during this time Banshee was only flown in two competitions and won them both. Leon's heart was obviously with the Zomby and when he went to war he even painted that name on the nose of his B-26

Leon Shulman with his Torpedo-powered 'Flying Cleaver' at the 1940 US Nationals where he placed 3rd in Class B. At the same meeting his smaller version of this design, the 42 inch span Bantam-powered Wedgy took top honours in Class A. These low CLA designs were the immediate predecessors of Zomby that led to Banshee.



Marauder! The Banshee design was not published until after the war when it was described in October 1945 Air Trails magazine, it was still generally considered to be far ahead of all the other contest models

to that time. Bill Winter wrote 'The climb we can safely state, is the fastest we have ever seen. The altitude gained in the climb guaranteed an out-of-sight flight every time the model was flown.' The design was



When asked by Bill Winter the editor of Air Trails magazine to explain how he managed to produce the fastest and highest climbing contest designs in the world, Leon Shulman analysed and described his design techniques in the May 1946 issue. The article included this fine Calhoun Smith illustration showing the relationship of the salient points between Zomby and Banshee and the final product, Zoomer.

subsequently kitted in USA by Megow (which company had also kitted the Zomby in 1942) and by Astral in this country in 1948.

The factors that made the Banshee popular with the rank and file were its simple construction, great stability and terrific performance - not at all touchy to trim, unless overpowered, according to Ron Warring this was 'a remarkable aeroplane' and 'on the score of performance was one of the best power models yet produced' (1949) he added that '...it is certainly one of the few high powered pylon models which is safe.'

Understandably, the design had a strong following in the UK and was especially favoured by some of our top competition modellers, the best known exponent probably being Gussie Gunter. Ron Moulton well remembers the Gunter Banshees (Pam Gunter also competed with this model with success) - powered by the Ohlsson 23 (3.8cc) which was almost too much power for the design, the models resorted to various aerobatic manoeuvres but kept going up! Ron Warring reckoned that even more than 10 degrees of downthrust was needed with a good '23' flat out, and he himself using 10



King of the British Banshees. Gussie Gunter was a member of the Bushy Park MAC, started modelling when 12 years old, and commenced contest flying in 1945 when he won both the Keil Trophy and St Albans Gala. His main interest was power duration and he really took to the Banshee notching up an impressive list of successes which included winning the 1947 Sir John Shelly Cup and placing first in the Irish Nationals amongst others.



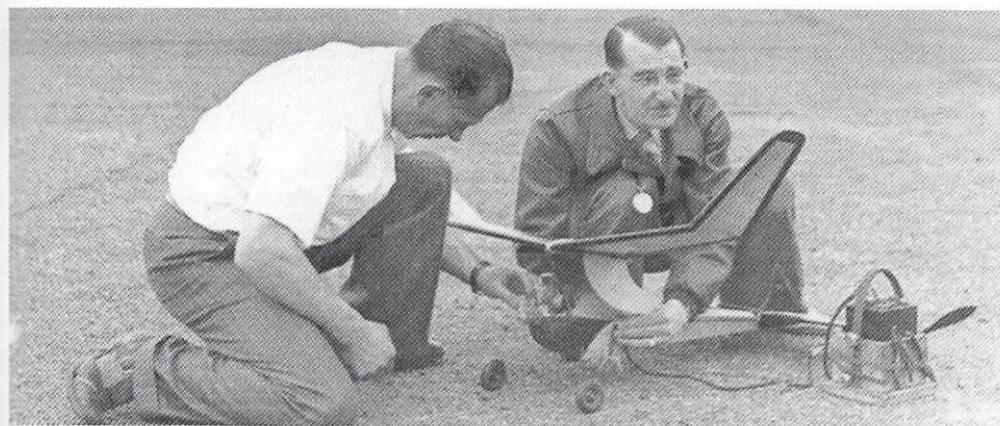
Norman Lees won the petrol competition in the Northern Area Daily Dispatch Rally at Woodford in 1947. Although his model retains the mono-wheel undercarriage and sub-rudders he has fitted an extra spar in the wing and dispensed with the upper leading edge sheeting.

when under full power the nose must remain above the horizontal otherwise a spiral dive can result, which has seen the demise of many pylon models. But Warring maintained that '...the Banshee has never proved guilty of spinning without apparent cause or as a result of very small trim adjustments. For power duration flying the safe way, this is the model.'

The Design

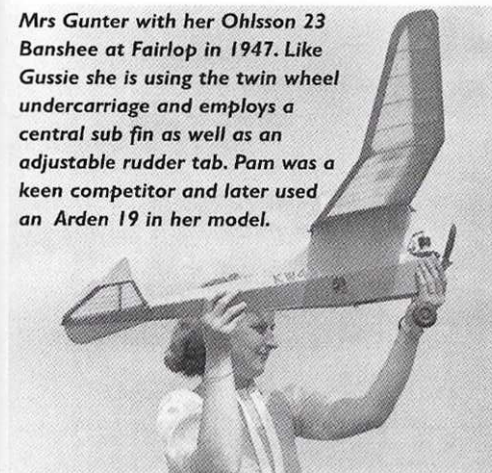
In creating the Banshee Leon Shulman had a wealth of experience to fall back on - earlier he had favoured the low CLA type of competition model and his Skyscraper and 'Flying Cleaver' designs with mono-wheel undercarriages that culminated in his 1940 Nationals winner called Wedgy which was powered by the then new Bantam 19 engine was described in October 1940 Model Airplane News. As mentioned, a great deal of refinement went into Zomby with its single wheel retracting undercarriage, folding propeller and completely cowled engine. Leon Shulman later analysed the features of this design family that explain why the simple Banshee had such an outstanding performance.

The same force arrangement as had proven satisfactory on the 44-inch span Super Zomby was used on the slightly larger (50 inch span) Banshee - the CLA was behind and above the CG and a line drawn through these centres parallel to the thrustline made an angle of 5 degrees to the fuselage datum line, while the centres of lift and resistance were both close together at the top of the pylon. Keeping the weight down was a major consideration and the model ready to fly with spark ignition engine with its weighty coil and battery was around 22 ounces. Engine power was well catered for with the rear disc induction Bantam 19, but this had to be converted into effective thrust to produce the necessary high speed climb and a coarse pitch propeller of small diameter was used - it was considered that

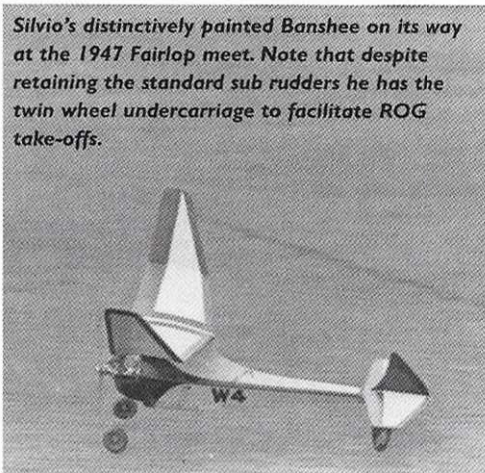


Silvio Lanfranchi of Bradford assisted by A.W. Cripps starting up in the 1947 Power Contest at Fairlop. Note the flight kit with spare propeller and tools - with that booster battery he never had any starting trouble!

Mrs Gunter with her Ohlsson 23 Banshee at Fairlop in 1947. Like Gussie she is using the twin wheel undercarriage and employs a central sub fin as well as an adjustable rudder tab. Pam was a keen competitor and later used an Arden 19 in her model.



Silvio's distinctively painted Banshee on its way at the 1947 Fairlop meet. Note that despite retaining the standard sub rudders he has the twin wheel undercarriage to facilitate ROG take-offs.



degrees of downthrust had never been able to open his Ohlsson powered model up without it looping - on his Bantam 19 (3.25cc) engined Banshee with the laid down 5 degrees of downthrust, engine at peak revs, his model had an almost vertical climb - eventually the model would hang on its prop

then flick into a tight loop and then continue climbing. So this power pattern was apparently a Banshee feature - if the model went onto its back during these evolutions, the large dihedral angle ensured a rapid return to normality - the model still ascending! The pylon layout requires that

the retardation of acceleration on a free flight model caused by such a propeller was negligible but the high pitch was needed to produce the thrust at speed. Drag reduction was seen as the main essential, the total frontal area was kept as small as possible and every airframe component was made aerodynamically clean to allow its passage through the air with the least interference.

The wing section was based on the well-known NACA 6409 but was 20% thinner and this presented a structural problem when the aspect ratio of 6:1 decreed that a deep spar could not be used because of the distortion liable to occur after covering and ageing. A very small cross section spar (1/8" X 1/4") was used on the upper part of the camber, adequate strength being provided by sheeting ahead of the spar on the top surface only. The most efficient flying surface plan form is the elliptical shape with its low tip losses and this was used on the Zomby, however, the tapered plan form used on Banshee was a good approximation easier to build but particular attention had to be paid to tip shape on the tapered wing panels to ensure that the drag producing vortices were dispelled as effectively as possible. The tailplane did use a deep spar and provided the basis for a strong anti-warp structure - the section was symmetrical to keep drag at a minimum. The fuselage was unusual - Leon called it the 'X' Type structure but '+' Type would have been more appropriate since it comprised sheet balsa plan and side elevation profiles (the latter suitably perforated for lightness) at right angles to each other faired by only four formers. It could be built in 1/3rd of the time normally taken to make this component, double covered with Silkspan or silk applied wet, the resulting shape had minimum profile drag.

A mono-wheel undercarriage was used fitted with a streamlined section wheel and ground stability was provided by two underfins on the tailplane. These were larger than usual being of sufficient height to ensure that the model sat on the ground at

Right: Doug Scott with his front rotary Ohlsson 23-powered Banshee at Old Warden Vintage Weekend August 1987. Doug forgot to activate the timer set at 8 seconds and lost the model. For the story of how Maurice Brett air searched for it in his Jackeroo and how it was eventually found by 'Biggles' (Chalkie White) in his microlight see Vintage Extravaganza, Aeromodeller, November 1987.



Also seen in the Power Contests at Fairlop in 1947 was Ron Warring with his model which won the Astral Cup. Note small diameter wheels and complete lack of sub fins or rudders - he wrote a fully detailed report on Banshee in March 1949 Model Aircraft and considered the use of a dethermaliser was 'absolutely essential', personally favouring Carl Goldberg's tip-up tail type.

the correct angle that gave the wing the right incidence for a 'jump-start' on release with minimum take-off run.

Banshee in UK

When the Banshee was flown in this country in competition various modifications were made, usually modellers dispensed with the single-wheel undercarriage, fitting the normal two-wheel type the better to satisfy SMAE ROG requirements. This meant that the underfins, which were quite vulnerable could be eliminated - Ron Warring considered that the design appeared to have sufficient fin area without them - however, often a single central underfin was used as a tailskid. Another Warring modification was to raise the location of the flight battery to the top of the pylon thereby creating the relatively high CG that he favoured in his contest models. He found the Banshee structure to be 'a masterpiece of simplicity', amply strong - 'the wing stood up to tight loops and bad landings with impunity' However, he stressed that the unique fuselage was only strong enough when covered in silk or nylon - 'Paper covering will not do.'

In the late-1940s most power modellers



Reduced-size Banshee (31.25 inches span) made by D Purkiss from the details published in the 1948 Aeromodeller Annual.

in this country tried the Banshee and this popularity almost started a 'Banshee cult'. Oddly enough Bill Dean did not make a Banshee, instead he was an avid Zomby supporter and wanted Keilcraft to produce that design as a kit but they never did. The model has found some support amongst vintage modellers in recent years although this has never been as great as one might have expected due without doubt to the shortage of decent flying areas and the sheer high performance of the Banshee, which if flown as intended with a hot Bantam or Ohlsson 23 was always a serious 'fly-away' risk especially on a 20 second engine run.

Banshee Fan

D Purkiss of Hornchurch remembered the deep impression Banshee made on him in the long ago and last year set about creating another and while searching for full-size plans came upon the scale drawing and description of the model in the 1948 Aeromodeller Annual. His enthusiasm was such that he just couldn't wait. Being a true vintage enthusiast he had to get cracking right away and enlarged the small plan times four and built the model in almost 2/3rd size. Intended for the GM 300BB engine the uncovered model complete with motor, prop and tank weighs 2.6 ozs, so its performance should be 'something like'! We await his flight report with interest and fully expect that in the interim he will have completed a Banshee in its original size. ●