

## ***Smoke Trials***

***Roger Simmonds***

***8 Orchard Way, Offord Darcy***

***PE19 5RE.***

***rsimmo@globalnet.co.uk***

As promised, herewith my report on the 'Jetex/Rapier scene' at the 2009 SAM Gala. It was a little hot, perhaps, but otherwise conditions were all that could be wished for, and it was a real pity we had to pack up at six o'clock on Saturday and five o'clock on Sunday, just when things were cooling down and perfect for old timers. Saturday morning was still, perfect for trimming; the afternoon was hot and sunny with a little cloud cover and just enough breeze to make it interesting. Sunday's early mist soon burned off and we were treated to a "strornery" hot day with some powerful thermals. Fortunately the wind was very light and my Flying Wing and Sharky stayed just (a foot or so!) on the right side of the hedge even when caught in very buoyant air. Other fliers were not so lucky, and saw their pride and joy disappearing. Upwards.

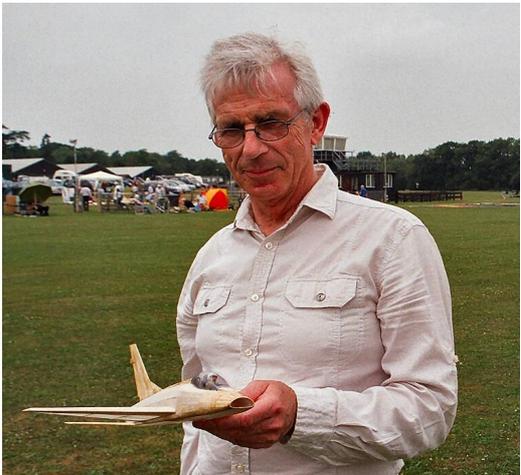
Sunday was the busier day and there were a goodly number of rocketeers leaving smoke trails, including John and Mark Digby (Miles M. 52, F 22), Gordon Hannah (Hunter and Swift); Jack Pritchard (profile Hunters and Hawks) and Chris Richards (Rocket Boy and a new profile Yak 15 for L3). André Bird brought a built up model - a Veron Coronette - as well as his usual fine selection of all-sheet models. A new face was Glynn MacArthur, who brought a Keil Kraft Hunter and DH 110, and a Skyleada Sabre and Super Sabre. The latter, uniquely, had an internal Rapier firing into a homemade augments tube. Another distinguished visitor was Denny Saxcoburg, (no stranger to those who fly with strings attached) who had a very nice Machbox. Meredith Evans demonstrated his XB-70 to good effect (this was fortunately captured on video by Mike Stuart) and Andy Blackwell had some great flights with his large and Small Jetex (50C or PAA Loader) powered Skyrays. I was also flying genuine Jetex, (having sorted out the problems with my 50C) and the Sharkies were going very well indeed. I also brought along my flock of Wrens for L1/Atom 35 and an unflown scratchbuilt CF-105 Avro Arrow for L2.



Given we were mostly using up old stocks, some from the dreaded mid-2008 batches, we had surprisingly few problems: Denny was unfortunate to suffer a ruptured case in his Mach Box just when it was flying very nicely indeed and I badly damaged a Sharky. By the end of a long day we were all fresh out of L2s, so can only hope the estimable George of SAMS Models will have a delivery in time for the next meeting.

**Top left:** Chris Richards' L3 powered Yak 15. Enlarged from the Dave Deadman plan, it went blisteringly well on its maiden flight. Note the downthrust tab.

**Left:** 1959 or 2009? ... an Avro Arrow turning into its final approach ....



**SAM Gala 2009. Clockwise from top left:** André Bird with his 'Floater'; the Floater in flight; Andy Blackwell's larger Skyray; Glynn MacArthur's DH 110, Sabre and Hawker Hunter; André's Coronette; Glynn with Super Sabre, Denny Saxcoburg with Machbox for L2.





**Above:** two nice action shots, courtesy of James Parry, whose collection of photos taken at Old Warden can be seen in his latest issue of 'Stick 'n Tissue'. The one on the left has caught the Arrow on its second or third sortie; on the right is the oh-so-reliable MiG 15 – pity about the empty office! Below are some comments on the other photos.

The 'Floater' was originally designed for Jetex 50, but André, who loves L3s, has practically doubled it in size. It flies (away) very well: I believe this is his third one! Andy Blackwell's Jetex100-sized Skyleada Skyray is a very consistent performer, and with the lighter winds of this meeting it stayed in both the field and out of the trees. Nor did it burst into flames. Both Mike Stuart and I have pleaded with him to paint his Skyrays, but Andy obviously prefers them in their 'bare bones'. Glynn's Hunter flew well in that typical 'KK P 1067 nose up' attitude; the Skyleada Sabre is, he says, a fine flier. In contrast, the DH 110, built according to the KK plan, is prone to a spiral dive (see *Smoke Trails 12*), and Glynn was loathe to waste precious motors on it. Mike Stuart's Super Sabre was a very tricky beast to trim: Glynn's has the added complication of an internal Rapier firing into a homemade augments tube. It glides fast from a vigorous hand launch, but, At 44g will need at least 200 mN to keep it in the air. Having built a Coronette as a lad, André's brought back happy memories. Phil Smith's plan shows the option of a Jetex 50, which Andy has fitted on his (as yet unflown) version. However, André says a standard L2 overpowers the light structure (note the extra wing braces), and the downthrust from the top mounted motor drives it into the ground. A 60 mN L1 proved inadequate, so an L2 LT

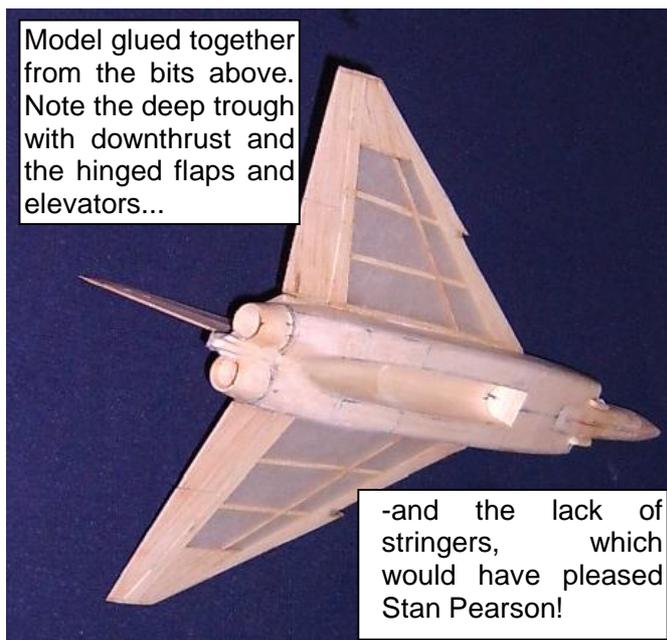
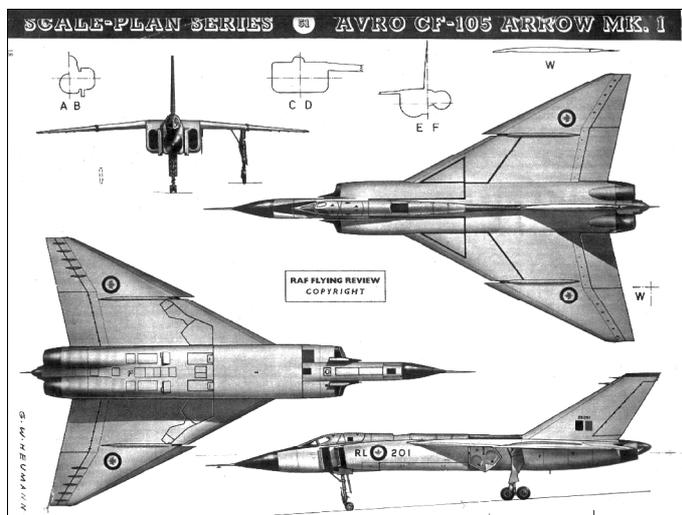


would probably be about right. But André wisely turned down my offer of a loan, having seen what one of my dodgy L2 LTs did to a Sharky and Denny Saxcoburg's lovely Machbox just when it was going well. The photo left shows that all-sheet models are not quite so invulnerable to casing failures as I thought!



If this was disappointing, it was more than made up for by the pleasing performance of my Avro Arrow. I have loved this Mach 2+ delta ever since it was featured in a 1958 *RAF Flying Review*, and it had long been my ambition to get one in the air to commemorate (if that's the right word) the fiftieth anniversary of its demise.

**Left:** A very happy columnist poses with legendary Harrier test Pilot John Farley after a successful maiden flight.



Model glued together from the bits above. Note the deep trough with downthrust and the hinged flaps and elevators...

-and the lack of stringers, which would have pleased Stan Pearson!

The CF 105 Arrow was designed to intercept Russian bombers coming in high and fast over the North Pole, and was similar to, but more elegant than, the F-108 Rapier designed to do the same job. It was cancelled in 1959 in circumstances which are still controversial.

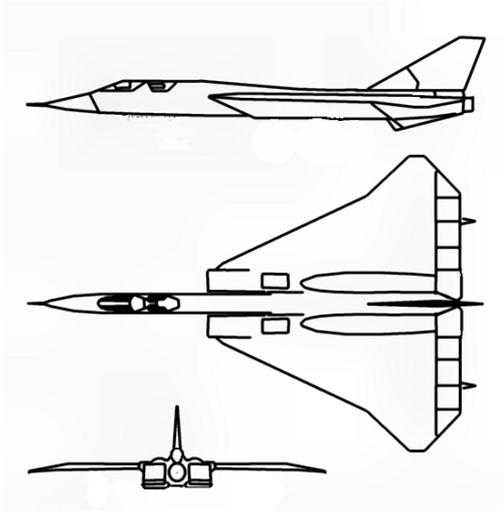
Though it has the lovely lines of a real 'goer', there was no contemporaneous Jetex design, so, as the next best 'vintage' option, I enlarged the 3-view from the *RAF Flying Review* (top left). 'Technical Drawing' as it was known at my school, is a skill that eludes me still, and apart from a few pathetic sketches on a scrap of paper, I built the model over the 3-view, shaping the bits of balsa as I went along. This is a method, long hallowed by Pete Smart, is a process perhaps more akin to sculpture than aeromodelling! The wings are built up, the fuselage, being square sectioned, is 'all sheet' with some block. As usual, 80% of the model went together in 20% of the time. I then started the fiddly bits like the jet cones/parachute housing and the air intakes, which are quite complex shapes. The finished bits all went together quite nicely. It was meant to be 'semi scale', but, as is the nature of things, I got rather carried away in the creative process.

Andy Blackwell had been mildly sceptical of the whole project, pointing out some of the potential pitfalls, viz: the 'grass-collecting' saw-tooth leading edge and the weight distribution of that long fuselage. He is also no lover of the complication of split/hinged flaps/elevons, reminding me that my earlier FD 2, which had a similar arrangement, was prone to changes of

trim on storage. All true. Nevertheless, he was on hand during the initial flight tests, offering good advice and warning me of large litter bin that some thoughtless council worker had recently erected in the middle of our village green without telling me. It's nice to have moral support in these times of trial. Launching with a catapult *à la* Howard Metcalfe (see *Smoke Trails 12*) showed a fast flat glide with  $-1.5^\circ$  flap and  $-3^\circ$  elevon (thus giving a bit of washout, always useful). Pleasingly, no noseweight was required. Andy, his scepticism allayed, entrusted his rare plastic kit to me so I could copy the decals. This helped with the final decoration no end.

The colour scheme was quite complicated for me, but the Arrow ended up a shade over 30g, quite reasonable for its 9" span and 13.75" length. The wing area is 28 sq in, equating to a very acceptable wing loading of 5oz/sq ft

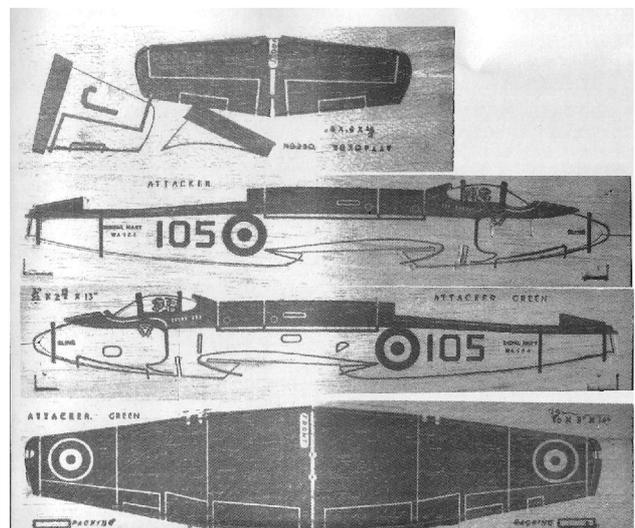
And so to the SAM Gala. the first powered flight of any model is always an exciting event, especially so for a scale jet, but an L2 of 140 mN had the Arrow climbing away at a realistic angle, the highly swept wing keeping it stable and it turned in a wide circle with no tendency for the nose to drop and a dreaded spiral develop ... safe burn-out at height, straight glide, good landing. Phew ... thank goodness the heart pills seem to be working! The Arrow, will, I think, prove a very reliable performer and worthy of that ultimate accolade for a 'jet' model, especially today, 'no waster of motors'. It's not a floater of course and seems pretty fast, if not quite the Mach 2 of the original. I cemented the movable control surfaces in place after the first flights. It needs at least 140-170 mN – I could give it a little more up as the trough will prevent any tendency to zoom – but I'm happy with it as it is: the cg, trough, motor position and rigging angles all seem fine and I'm loathe to fiddle with it.



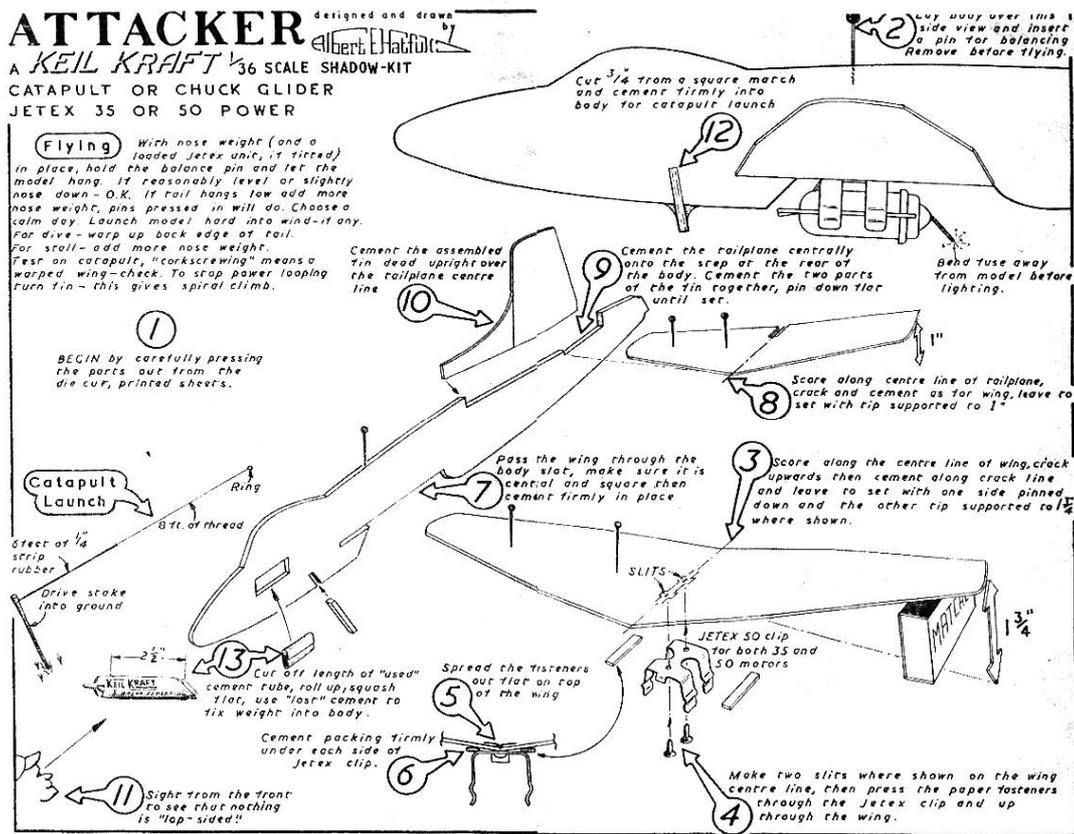
**Above:** The NA F-108 Rapier. The square fuselage section lends itself to all-sheet construction and its similarity to the CF-105 – just look at all that wing area – should make for as nicely performing a model.

I'm really very chuffed with this design, and it's great to see the Avro Arrow back in the air after 50 years. There's only one problem: having seen it fly, several folk have had the temerity to ask for the plan. Plan, what plan?! I shared my problem with a 'Friend' who was admiring my model. He turned both the model and problem over. After some cogitation, and noting that the model was mostly put together mainly with good old-fashioned balsa cement, he came up with a solution: "soak it in a large tub of ethyl acetate", he said, "after two days you can disassemble the model and draw round the bits." A plan will eventually appear, but in the meantime you could always design and build a your own F 108: a Rapier for a Rapier, so to speak! It's a real pity that, as with the Arrow, no gifted designer of the time, Paul Del Gatto or Lloyd Hunt for example, was inspired to make one.

I had an encouraging email from Walter Snowdon. Walter is, like me, keen to recreate the old Jetex-powered profile designs, especially those from the Keil Kraft, Veron and Skyleada stable. He is particularly interested in the Shooting Star, Sea Hawk and Attacker. The problem is, Walter observes, 'It is doubtful if anyone traced them before building and this was long before the days of easy access to Xerox machine, let alone a colour photocopier. Fortunately, a kind reader (whose letter I have alas lost) had a rare KK Attacker in mint condition (right).



Having these sorts of quality scans is necessary to any authentic recreation and they can easily be printed on to tissue or decal paper for transfer to balsa. Subtle improvements can be made in the digital domain: small inaccuracies corrected, any flaws in the printing can be filled in and, in this case, a right side of the fin (not present in the original) fabricated. Also, the Attacker can be reduced somewhat to make it (a) more convenient for an A4 printer (b) more suitable for an L1 rather than an unobtainable L2.



The instructions are a most interesting document in their own right, as we learn that the Attacker was designed by our old friend Albert Hatfull to a scale of 1/36. Details of catapult launcher are given – useful if we have no Rapiers – which consisted of 6 foot of 1/4" rubber and 8' of thread. Strangely there are no guidelines as to the amount of stretch required. I suppose it depends on the quality of the rubber and the strength of the (the then ubiquitous carpet?) thread. Can one still get carpet thread? If any reader can help with any of the other profile models on Walter's list I (we) would be very grateful.

Finally, following the discussion of John Cobb's Crusader in *Smoke Trails* 23, Dave Goodman, via Andy, allowed me access to this rare example. Though distributed by 'East Anglian Models', it was produced by 'Bounty Ship Kits', not Skycraft, as I had thought. Perhaps sensitively, given the circumstances of Cobb's death, nowhere does the word 'Crusader' appear on the box or the plan.

