# Smoke Trials 3

**Roger Simmonds**
**8 Orchard Way, Offord Darcy**
**PE19 5RE.**
**rsimmo@globalnet.co.uk**

***Aeromodel Weekend, July 2009***


Only a few weeks after a splendid SAM Gala, we met up again at Old Warden on July 26/27. Here the weather was not so kind: quite windy and thermic on Saturday, almost impossibly windy on the Sunday. I flew only profile and 'semi profile' models and even so I (and Ruth wants to add, friends and wives) had some very long retrieves. My 'proper' scale models stayed in their boxes. Flying on Sunday was really only possible in the lee of the copse - any model which rose above the foliage risked being blown into the next county. After a couple of close calls I 'spectated' for the rest of the day. Other rocketeers were not so pusillanimous and enthusiastically demonstrated Paul Del Gatto's maxim: "if you fly in a high wind you will have some spectacular flights, but be prepared for crashes". Jetex 'scale' models are not noted for their glide and these generally stayed in the field, or were captured by helpful trees.

André Bird again seemed to have a model in the air continuously: his new X-13 Ryan Vertijet drew a round of applause after a particular fine flight with a Rapier L2 HP, and his rather battered Veron Coronette, after making a few lacklustre flights powered by twin L1s, made a wonderful final 'death or glory' flight towards the end of the afternoon with a single L2 LT. This is the perfect motor for the Coronette – how it stayed in the field I do not know. André promises to make another one.

**Left:** Smoke Trails over Old Warden: **Top**: evocative shot of Derek Knight's L2-powered Swift. **Middle**: Profile models suited the conditions well, and none flew better than Jack Pritchard's L1 powered Hunter or André Bird's L2 powered Ryan Vertijet. **Bottom**: André's Rapier powered Coronette on its final, and best, flight.

Chris Strachan, having had little luck with his more stately Rapier powered scale models, and desperate to get something in the air (and yet in the field), launched his Sukhoi 11 into the raging elements propelled by a mighty 230 mN L2 HP. This boldness was rewarded with a wonderful flight – a near vertical climb to great height followed by an equally swift descent. In contrast, Derek Knight was well content with several very stable flights with his venerable Swift. Powered by L2s of uncertain age, it looked marvellous flying at little more than head height … invariably into the trees. As one wag remarked, "well it was a ground attack aircraft after all!" Newcomer Steve More risked a powered flight with nicely built but difficult-to-trim EAP Eurofighter (*Aeromodeller* 1987) modified for L2. It was a pity it was badly damaged by a burn-through that made further test flights impossible. But Steve, like all good rocket pilots, is made of the Right Stuff: he did not seem too upset and is rebuilding the model with fixed canards and moveable elevons to aid trimming.

Russ Lister brought along his new vintage duration model. This was most impressive with an L2 LT and, not unexpectedly, did indeed fly out of the field (see below). I am not allowed to say too much about this model – soon to be a Bluebottle kit – but Dick Twomey must be very pleased indeed! I have already put my name down for one. Russ comments: "I was only there for the Sunday, and enjoyed the 'different' feel of the small group flying in the lee of the trees – it had an atmosphere almost like an indoor meeting with everyone flying within the constraints of the shelter. Thanks to all that helped retrieve my lost 'jetex' model, especially Andy [Blackwell] and his tree climbing (trunk kicking?) skills! Despite the fact that our remaining L2s have almost been 'burnt to extinction', flying was dominated by Rapier models at times, so what are we to expect should a steady supply [of Rapiers] return? I look forward to it!"

**Top left:** Derek Knight has not yet received the recognition he deserves for his Rapier models: here he is with his arborophilic Swift. **Below**: Steve More with his EAP. **Next:** Chris Richards' Jetex 50 powered Fizzel Fazzel. **Bottom**: Russ Lister's new L2 powered duration model.

**Top:** Derek Gardiner came across this Sharky 'look alike', or 'Sharkenstein' complete with a corroded 50C at a Car Boot sale. **Below:** The MiG 29 was 'nearly there' trimming-wise, but I ran out of reliable L3 motors!

Despite the munificence of SAM colleagues, concerned their favourite columnist could go 'cold turkey' without his 'Rapier fix', my cache of L2s is depleting at an alarming rate. In order to eke them out I built a rather nice 'semi profile' MiG 29 for the somewhat motley collection of L3s I have begged, borrowed, or stolen over the previous months. The MiG 29 looks great in the air, but coherent trimming was in the end defeated by inadequacies of design, turbulence, and, unfortunately, the variability in the motors' performance.

This debacle notwithstanding, a number of SAM folk were impressed by the rocketeering going on around them, and, filled with enthusiastic nostalgia, asked how they too could join in the fun. In the light of uncertainties in Rapier supply, there is no easy answer to their question – the best advice seemed to be, 'try 'vintage Jetex'. Fortunately just this was being demonstrated to good effect by Chris Richards' Fizzel Fazzel, Andy Blackwell's Skyray and my Sharky, all of which were going well with Jetex 50's, pellets and fuse and gauzes of various sorts from various sources, showing what is possible in these days of eBay! The Sharky was going particularly well with late Sebel pellets and a 50C that was really 'on song'. It flew wide vertical loops to 200 feet and was, for 20 sec., the fastest model on the field, R/C models not excluding. Wow!

***Reactionary Ruminations***

Reports of flying events, nice as they are, would be of little more than ephemeral interest without some analysis of, and reflection on, the activities. Are there general principles that can be derived from the particulars? Can any trends be inferred? Were there any encouragements or warnings for the new or established jet modeller? And last, but by no means least, what are we going to do without Dr Zigmund's Rapiers? So here are a few thoughts, in no particular order:

**1**. Howard Metcalfe must be well pleased at the popularity of his little Hawk profile model, which inspired Jack's analogous Hunter. Note the L1 mounted in a 'weapons pod', which keeps motor exhaust well away from the balsa or (more to the point) Depron structure. The exhaust deflector allows the cg to be optimised for glide: in consequence they can be trimmed for a turn and cope with blustery conditions well. Jack Pritchard's model was all balsa; whilst it eschewed the more alarming aerobatics I have seen the lighter Depron models perform, it was most convincing in the air. Howard has a Talon, Harrier and a new Mirage fighter that he hopes to bring to Old Warden soon.

**2**. I last wrote about JA Fleming's X-13 Vertijet (*Model Aircraft*, March 1960) in *Smoke Trails 9*, wondering if, free of the burden of carrying a heavy 50C, it would perform splendidly with an L2. And so it proved. André had further lightened the structure by using $^1/_{32}$" balsa sheet in lieu of the recommended $^1/_{16}$", hoping it would fly with an L1. However, it needed at least 120 mN for steady flight and lived up to its name with a 200 mN HP.


Incidentally, *MA* offered a grand prize of £2.00 for the best photo of a Vertijet sent in by a member of their 'Wings Club'. I'm sure my picture would have won. Alas, my membership has long lapsed.

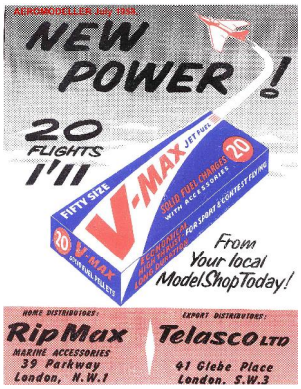
**3**. I was able to assure Derek that the 'Sharky' he found in a car boot sale was no more than a very rough approximation of the Real Thing, an example of which I had to hand. Derek didn't know who had made his 'Sharkenstein', or whether it had been flown, though the Jetex 50C had obviously been fired (and not properly cleaned afterwards). Derek now has a genuine Sharky plan, and promises to make a proper one and refurbish the rather sad looking motor in time for the next meeting. Most Jetex motors, especially the steel cased versions, clean up well and work fine with new washers and gauzes, but one point to watch is the edge of the casing of aluminium alloy motors. This is easily damaged, and for this reason, when buying vintage motors 'unseen', a 50C is to be preferred to a 50/50B, and a PAA Loader to a Jetmaster.

**4**. I have seen several examples of George Milner Smith's MiG 29 (*Aeromodeller*, 1996) at meetings, and they really do look great in the air; but most do no better than an extended glide with your average L2 and I have yet to see one, including my own, make a complete flight. Originally for Sebel/Powermax 50C, the MiG 29 needs, unless built very light according to Howard, at least 240-260 mN for sustained flight, which I hoped my L3s could provide. Which most did, though not reproducibly, and on its last flight of the day with one of Chris's pukka motors it was going well until the nose dropped and it spiralled into the ground. This rather brought home the truth of Howard's observation that this particular design "goes well in a flat calm and in a straight line but doesn't like any turn or turbulence". Hmmm … we have seen this sort of behaviour before – notably in Keil Kraft's DH 110, but I was hoping that the steps I had taken to ameliorate this tendency of the MiG 29 – more dihedral and 'decalage', twin fins of scale area and an exhaust deflector to enable a more rearward CG – would be sufficient to give a more robust flight pattern. Not so! Our own Peter Michel comments: "About lateral stability, or lack of it, don't conclude that the only solution is more dihedral – something that I'm sure scale guys want to avoid at all costs. I was trimming a new (vintage) A2 which was laterally unstable. Although far from spiraling in, it did meander about to no good effect, despite quite a lot of auto-rudder. I put this down to lack of sufficient dihedral and cured it by inducing wash-out on both outer wing panels. I just wonder if this dodge might be of some use in scale jet trimming". Indeed it could, and I will steam in $^{1}/_{8}$" washout into the MiG 29's (essentially flat) wings before I entrust it with a precious example of an L4.

**5**. Some further reflections on the MiG 29 and Sharky: (a) The MiG 29 was designed for (Powermax/Sebel) 50C. (b) It needs at least '270' mN (i.e. an ounce or so in old money) to fly. (c) According to the designer, it flew well with a Jetex 50C even at an all up (loaded) weight of over 60g. (d) This implies a Jetex 50C was a lot more powerful than the original 50 (140-150 mN). This has been questioned by some readers, though Howard maintains a 50C overpowered the Keil Kraft and Skyleada scale series. (e) The Sharky goes well with an L2 LT, appears overpowered by a 'standard' (say 140 mN) L2, and flies steadily with a Jetex 50B or 50C with old pellets. Recently I acquired some late Sebel fuel in plastic boxes. The Sharky was practically pulled out of my hand and flight pattern was transformed (see above). (f) Therefore, given a 'tight' motor and optimum (Sebel) pellets a 50C can deliver a lot more than the 1950 original. QED.

**6.** My advice to 'try Jetex' is not quite as perverse as it may seem: motors and pellets still appear on the market regularly, prices are reasonable and an at least adequate, and sometimes unexpected, performance can be obtained with most pellets, however unprepossessing their apparent condition. For example, my 50B works happily with ICI pellets that had been stored for some years in a plastic butter tub, and smelled not only of guanidine nitrate but also butyric acid! So pellets, Wilmot Mansour or ICI, and steel cased motors can be bought with confidence. And so, apparently, can V-Max fuel.

***RipMax's V-Max Solid Pellet Fuel***




**Above**: Advert, *AM*, July 1958

The *Aeromodeller*, in its 'Trade Notes', July 1958, had this to say about V-Max: "Rarely do we hear of a new British item being exported prior to home consumption, but such was the case with V-Max, the new solid pellet fuel for jet reaction units by Ripmax. Many advantages are claimed for V-Max, not least being more power for less outlay. Each pellet delivers half-ounce plus thrust and two charges give 16-18 secs. run time with excellent changeover. It burns cleanly and without acrid smell. It is non-toxic, ignites readily and utilises a large mesh gauze which does not hamper thrust. Above all, it has established itself in the USA with a tremendous demand which is constantly increasing. Sold in neat tray boxes, it brings the cost per flight down to less than 1d".

Not withstanding this 'puff' (or should it be 'fizz') from the *Aeromodeller* which I would guess lazily repeats Ripmax's publicity hand outs, V-Max had a somewhat dubious reputation. Here is what Bert Judge had to say about it in *Smoky Addiction 6*: "Ripmax had developed a fuel which was cheaper than ICI's and had approached our American agents and persuaded them to retail the fuel in America. As this fuel burned at a higher temperature there was a danger that the standard aluminium motor cases would fracture, and we had lots of complaints relating to the use of V-Max in Jetex motors".

Now neither Andy Blackwell nor I had any experience of V-Max, so could not comment on Ripmax's claims, but Andy recently acquired a pack, enabling a number of tests which are reported below:

"Initial test of a pellet in free air saw it ignite very readily with a short length of fuse. The pellets have a dark brown speckled hue and the instructions suggest scraping the surface to aid ignition. This turns the pellet white, but it's not clear if this is due to removal of a brown coating or a reaction to the abrasion. The pellet took 10 seconds to burn end to end with light blue/white gas emission; there was no disintegration of the pellet, which remained completely solid throughout, leaving an ash 'skeleton' that had changed to a white/pink colour. This was hard but brittle and some force was required to make it crumble. It dissolved readily in water with minimal excitement [I take it Andy means his skin was not attacked and he retained the use of his fingers] leaving a slippery feeling from the dissolving residue.

Using two pellets in a 50C motor, I saw little need for a gauze because, (a) ignition was exceptionally easy, and (b) due to the absence of particle emission from the burning pellet, it was unlikely that nozzle blockage would be a problem. The engine run proved these assumptions correct. A small coil of fuse was butted against the pellet, the motor closed and a small amount of fuse inserted for ignition. This was immediately ejected and the first pellet burned steadily with suitable thrust for approximately 10 seconds. There was a break of perhaps 1-2 seconds before the second pellet started burning (I hadn't burnished the ends of these pellets) and the duration was identical to the first. The motor was very hot after use, but no signs of damage were seen. The smell of the gas produced was not unpleasant with some exciting overtones [!]. Inspection of the motor after cooling revealed a hard skeleton of ash with some black remnants picked up from the 50C casing. A slight push on the face of the skeleton loosened it to the extent that I could pull it out complete; the same trick worked with the second pellet. No remains were left inside the motor, considerably aiding cleaning. Altogether, this fuel is better than Sebel fuel on several counts, indeed, my findings suggests a performance equal to the ICI fuel in all but duration, but exceeding it in ease of use, particularly in ignition. This is a good set of results and I would suggest this much maligned fuel has more promise than we were led to believe.

There is though, one questionable attribute – the high combustion temperature, which exceeds that of the original ICI fuel, and would have a severe effect on the aluminium alloy engines causing, like Sebel fuel, destruction after 2-3 engine runs". Many thanks, Andy. To conclude: V-Max pellets appear viable even after fifty or more years and I hope more examples appear on the market. Their performance is surprising for a formulation whose main constituents are wood flour and ammonium nitrate. But they should be used only with steel cased motors: their use in a 50B is, in Bert Judge's memorable understatement, 'most ill advised'.

***Bill Henderson and the Avro Arrow***.

My little Avro Arrow seems to have sparked some interest in the original: so below is reproduced, with Bill's permission, this (slightly edited) article he wrote for the Toronto Aerospace Museum Newsletter:

"Starting in 1950, a growing stream of ex-RAE, Farnborough, apprentices headed west to Canada and many found their way to A.V. Roe Canada Ltd at Malton Ontario, or to the sister company Orenda Engines Ltd across the highway. The apprentices' expectation was that Canada would provide not only a fresh market, but also a "can do" approach to life and business that would favour innovation; and how right they were

For many of us it was revealing to discover that the first commercial jet airliner to fly in North America – the Avro C102 –was ahead of, and much better looking, than the Avro Ashton designed by Avro Aircraft in the UK. The Jetliner's first flight was in August 1949, but development had to be abandoned due to the necessity of concentrating the company's resources on the CF100 two-seat long-range interceptor for the Canadian Air Force. Again, we were all impressed with this twin engine design since it was specified to meet unique Canadian requirements of long distance patrolling and reliability in extreme weather conditions, and required the home-produced Orenda turbojet engines (after which the Avro engine company was named). Although the CF100 was a success it was soon decided that the Air Force would require a supersonic all-weather interceptor and, after a short period of design studies, A.V Roe was given the go-ahead for the delta wing CF 105 Arrow in July 1953. It may not be any coincidence that the flow of ex-RAE apprentices to Canada peaked around 1953. Avro was recruiting intensively in the UK and the guys who had gone before were sending back the news about the excellent opportunities awaiting young aircraft engineers in a company not hidebound by tradition. Many of us young graduates from Farnborough thought that this was the aeronautical project of the century and we wanted to be part of it.

Six years later the Canadian government cancelled the project to make way for unmanned guided missiles, since the manned interceptor had been decreed obsolete by the Americans. Maybe the Arrow was an impossible dream, but many of the dreamers went South and played a prominent part in the American space programme, including a number of ex-RAE apprentices. Others went to various US aircraft companies or back to the traditional Canadian business of light transports with De Havilland Canada, including development of innovative turboprop engines. Some, like myself, became part of another innovative Canadian project, the FHE 400 Hydrofoil submarine chaser, but, because of government timidity, it suffered the same fate as the Arrow Many others went back to the UK and eventually became part of the Concorde development team.

We now go forward to the year 2000 when a major reunion of ex-RAE apprentices was held at Farnborough. The American/Canadian ex-Avro Canada contingent was present in strength, and met up for a reunion lunch with those who had been through "Black Friday" and had returned to the UK over forty years ago. I brought along various memorabilia, including two Arrow models to be used as the centrepieces at the lunch.

After the reunion I went to stay with an old Farnborough friend, who used to work at Orenda and who now lived in Cambridge near to the Imperial War Museum [IWM] at Duxford. I did not want to take the models or memorabilia back to Canada and offered them to my friend. On a whim he phoned Duxford to ask whether they would like the Arrow stuff for their displays and, having been invited behind the scenes, we were much impressed to find that they knew what the Arrow was! It transpired that they were in the middle of planning the content of IWM North and could just possibly make use of one of the models. Apparently they did, because on a recent visit to the new museum at Salford Quays near Manchester, my friend saw the model we had donated in a case on a wall near a full-size turbo jet engine. There was no label as to what it is and very few visitors will realise that it is the Avro Arrow or its connection to Manchester through the Canadian subsidiary of Manchester based Avro Aircraft. But it is nice to know that IWM thought enough of the Arrow project to put a model of it on display". Many thanks, Bill. Has any reader been to IWM North and taken a picture of Bill's Arrow?

***More US Adverts***




My request for 'Jetex-related' adverts was happily answered by Stephen Herbert, who has a collection of *Flying Models* from the fifties. Not only was Stephen happy to scan the adverts I find so evocative, he also offered to supply whole articles with a Jetex theme. This is a rich seam indeed, and I will share Stephen's generosity as the months go by.

As to this first instalment of adverts from 1958, note the missiles designed by Larry Conover (he of the deltas) and the potent Competitor and Contender. Where are examples of these, and the Swisher, today? Are the Wren and Sharky to be sole reminders of bygone ARTFs? By far the most interesting model is Paul Del Gatto's futuristic Space Explorer. Like the Wilmot Mansour Zyra, the motor is right at the back. I wonder if, unlike the Zyra, it actually was capable of sustained flight. I'd love to get my hands on one!