The Thermaleer

"Half A Texaco delivers twice the satisfaction at less than half the price"

VOTA: Victorian R/C Old Timers Association (SAM 600) Inc.

Photos courtesy of Trevor Boundy

Are these the men to beat in the popular 1/2 A Texaco event ?

Barry Barton with his highly refined and trimmed Anderson Pylon on the left, and Graham McDonald with his all new, super competitive, Lanzo Bomber. (Stay tuned for further details and competition results.)

SAM 600 Website <http:www.sympac.com.au/jtboundy>
Download this newsletter <http://www.ozonline.com.au/~sam600nl>

President's Report

Hi Folks. First I would like to thank last years committee for a job well done and to welcome those on the new committee. Also to thank the members at the AGM for allowing me to be President for another year.

Some good news, Ian Triffitt has offered to take on the Secretary/ Treasurer role for next year. The SAM 56 postal comp from the USA was flown Sunday August 9th. Results of the Bendigo competition, including postal, are in this newsletter. At the next meeting we will discuss a comp in August 1999 and a venue for it. Hope to see a full house next meeting. Happy landings, Chris Lawson.

NEXT MEETING

Meeting #57 will be held on Thursday, September 24th 1998, 7:30pm sharp at Saturn Hobbies, located at 17 Ardena Court, Bentleigh East (Melway 68 J-12) of East Boundary Road (which is opposite the Moorabbin Memorial Swimming Pool) Saturn Hobbies will be open prior to 7:30pm.

On most Sunday afternoons and Thursdays, Thursday Old Farts Fun Fly (TOFFF's day) there is casual flying at the SWAMPS club on a private property at Lang Lang, (conditions permitting) by courtesy of Fred Chigwidden's son David. Members are welcome, especially those new to flying are welcomed to the SWAMPS field. Model and pilot training sessions are conducted by Peter Donovan and others. Location and local field rules can be obtained from Fred Chigwidden, you can reach him at 03 5997 5675.

Notes from the Editor

The recent discussions about rules changes, models, engines and so on prompted me to publish this letter (pre Nostalgia ?) to VOTA members from the late Monty Tyrell, kindly supplied by former Editor, Max Hayes

Gentlemen of Vota,

Just what is an Old Timer ? Is it a character over 50 years of age flying models, a spark ignition engine, a pre 1942 model or a combination of all three ! No way. When you look around the various Old Time meetings quite a few of the fliers only fit into the pre 1942 model concept because they have a latent interest in something that happened in many instances long before they were born. Most encouraging.

I must question, however, this blindly following the U.S.A. concept of pre 1942 models for the following reasons. Australia until the early post war period was the Antipodes and our model aviation status lagged behind the rest of the world, most particularly the U.S.A. By the early to mid 1950's we were more than holding our own in advanced designs. Likewise Britain and some of the Continental countries.

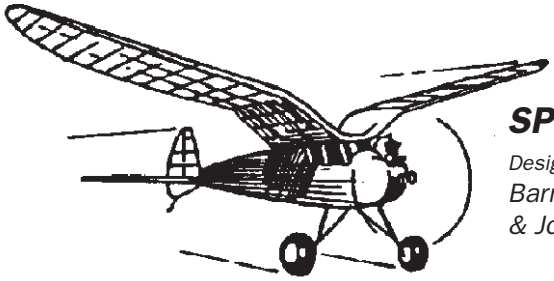
In retrospect, I must recall the Supa Hatchet, The Hyphen, The Flying Pencil as hot contest models, all from Australia. I'd like to see these planes with the power hungry contestants competing against the Playboys and Zippers etc. Possibly you have never heard of them. Then, for the pretty plane followers, how about the Frog 45, Frog Powavan, Black Magic and so on. All planes we are denied building ! Plans on all these are available via old Australian magazines e.g. Australian Model Hobbies the old 'Aircraft' columns conducted by the great Jim Fullarton. Nothing's impossible. Seek and ye shall find.

Our present rules throughout Australia deny the existence of many splendid model planes, particularly Australian designs, more's the pity. Only a combined effort by the Australian SAM chapters can rectify this sad state of affairs.

I therefore think it's about time we got together and went for an All-Australian event to supplement the existing events or adopt the idea in total. In other words, the Australian SAM chapters should seriously consider a forty year rule on any plane originating in Australia. In 1993 it's 1953 or earlier, in 1996 it's 1956 or earlier. Get the idea ? It would also be a very efficient way of getting rid of the Playboy and Lanzo Bomber rut we are in. It would also bring in fresh overseas designs many of which could be older than the operators of them.

Your comments in our newsletter would be much appreciated by the committee and members. Some day, somewhere, somebody will instigate it. Why shouldn't we show the, way ? or-are we going to sit on our backsides and adopt it when some other group proposes it? Sincerely, Monty Tyrell

SAM 375 (USA) (Life member), VH-13 (VMAA) (Life member)



SPOOK

Designed 1940 by Barney Snyder & John Muir

Victorian R/C Old Timers Association SAM 600 Inc.
Statement of Receipts & Payments Y/E June 3 1998.

Balance 1st July, 1997		$2,114.22
INCOME		
O/T Plans	135.70	
SAM Span	72.00	
SAM 600 Transfers	30.00	
Donation	30.00	
Membership Fees	781.95	
Auction & Raffles	55.00	
Swan Hill	691.00	
Interest	2.50	
Advertising	72.00	
Championships & Comps.	87.00	1,1957.15
		4,071.37
EXPENDITURE		
Bank Charges	33.31	
Fees - Inc/MAAA	42.00	
Newsletter	222.00	
O/T Plans	109.70	
Printing & Stationary	24.65	
Postage	361.10	
SAM Span	123.65	
Swan Hill, Trophies, Comps.	1,702.30	2,618.71
BALANCE AT 30TH JUNE, 1998		$1,452.66

Bank reconciliation as at 30th June, 1998	
Balance 30/06/98	2,114.22
Add: Receipts	1,957.15
	4,071.71
Less: Payments	2,618.71
Balance at Bank 30/06/98	$1,452.66

AUDITORS REPORT

The above represents a true extract of the cash books of the Victorian R/C Old Timers Association SAM 600 Incorporated and that the cash balance as at 30th June, 1998 is correctly stated.

Dated at Dandenong this 29th day of July, 1998
CR James FCA, Hunt Frame & Partners, Charted Accountants

The Black Wire Syndrome

Now for the definitive answer to this problem, from Red Scholefield < redscho@gnv.fdt.net > . The Black wire corrosion is covered at the R/C Battery Clinic but to save you time looking it up here is the text:

The black wire syndrome is an occurrence in battery packs (Ni-Cds) where the negative wire becomes corroded (turns from shiny copper to blue-black). This is the result of either a shorted cell in the pack, the normal wearout failure mode of Ni-Cds, or cell reversal when a pack is left under load for an extended period.

The sealing mechanism of a Ni-Cd cell depends to some degree on maintaining a potential across the seal interface. Once this potential goes to zero the cell undergoes what is called creep leakage. With other cells in a pack at some potential above zero the leakage (electrolyte) is "driven" along the negative lead. It can travel for some distance making the wire impossible to solder and at the same time greatly reducing its ability to carry current -- and even worse, makes the wire somewhat brittle.

A switch left on in a plane or transmitter for several months can cause this creepage to go all the way to the switch itself, destroying the battery lead as well as the switch harness. There is no cure. The affected lead, connector, and/or switch harness must be replaced. This leakage creep takes time so periodic inspection of the packs, making sure that there are no shorted cells, insures against the problem. The cells should also be inspected for any evidence of white powder (electrolyte mixed with carbon dioxide in the air to form potassium carbonate). In humid conditions this can revert back to mobile electrolyte free to creep along the negative lead. Some "salting" as this white powder is referred to, does not necessarily mean that the cell has leaked. There may have been some slight amount of residual electrolyte left on the cell during the manufacturing process. This can be removed with simple household vinegar and then washed with water after which it is dried by applying a little warmth from your heat gun.

C. Scholefield, Energizer Power Systems:
Red's R/C Battery Clinic <redscho@gnv.fdt.net>
URL = http://yoda.fdt.net/~redscho

V/P Ted Hall's Contest Calendar 1998

Eastern States Gas Champs:
NSAC Wangaratta, Vic.
Saturday 3rd October - 38 Antique & Duration
Sunday 4th October - 1/2 A Texaco & Texaco
Contests run to 1995 MAAA Rules.

Haddon: BAI (Carngham Road Haddon)
Saturday 14th November - 38 Antique & Duration
Saturday Night Hanger Rat
Sunday 15th November - 1/2 A Texaco & Texaco

Roy Rob will be a 2 day event next year, we will need to determine which events we will hold.

Results: "Model Engine" Bendigo QBW contest (continued by postal comp.)

Texaco

Name	1	2	3	4	5	Score	Fly-0ff	Total	Place
Graham Sinclair	600	600	600	600		2400	2414	4814	1
Chris Lawson	600	600	600	600		2400	940	3340	2
L. Clifford	600	600	600	600		2400	733	3133	3
Peter Bennett	600	600	600	600		2400	722	3122	4
J. Jakab	600	600	600	600		2400	714	3114	5
Trevor Boundy	600	600	600	600		2400	662	3026	6
Jock McKenzie	500	0	600	600	487	2187		2187	7
Barry Barton	443	404	401	295		1543		1543	8

'38 Antique

Name	1	2	3	Score	Fly-0ff	Total	Place
Trevor Boundy	600	600	600	1800	973	2773	1
Peter Bennett	600	600	600	1800	626	2426	2
Don Cameron	232	294				526	3

Duration

Name	1	2	3	4	Score	Fly-0ff	Total	Place
Graham Sinclair	420	420	420	420	1680	851	2531	1
Trevor Boundy	420	420	420	420	1680	842	2522	2
Peter Bennett	420	420	420	420	1680	605	2285	3
Kevin Fryer	420	420	420	420	1680	581	2261	4
B. Taylor	282	420	373	316	1391		1677	5
Jock McKenzie	256	420	280	420	1376		1376	6
Barry Barton	310	317	376	255	1258		1258	7

Notes from Queensland

(John French Letter to Trevor Boundy, 15/06/98)
Just a quick note to accompany the fuel article as requested by Allan Laycock. I have looked out a few photos that you may be interested in, too.

1) is a shot of Bruce Knight's MG2 I took last May at the Veteran's gathering at Muswellbrook.

2) is a construction photo of my 3lbs, 68" span Hayseed for OS32 SX-H. Very quick and beautiful glide, but of course, 17 seconds has shot that in the foot. (Ed. note: Come fly with us).

3) I thought you would like this one, do you remember my biplane rubber powered "Ladybird" at Canowindra one year ? This was a design by the same designer for diesel power. Since covered with Polyspan and red and black Airspan trim. I still haven't flown it under power yet. Glides OK.
I know you like C/L, so here's a shot of my Keil Kraft "Stunt Queen", built from only the plan, and it has Allan Laycock's Frog 500 in it. Clear micafilm all over, then yelow and black Airspan trim, doped and then Hobby-poxied. Unflown yet.

5 & 6) My very first 1/2 A Texaco model, only just built it last month. It's an "Alert", and covered in yellow Airspan, uses Futaba 2 channel Rx, 2 x 9 gram Naro Servos and a 150ma nicad, it weighs 12 1/2 ozs, and the first three flights were all 6 minute maxes, and it came out 2nd in the fly-off at our Queensland State SAM Champs.

7,8 & 9) are of my Saito 65 FS powered 4lb 80" span "Feather Merchant". My Hayseed for Saito 65 was a bit too heavy at 4 3/4 lbs so I made this as light as I could. Do you know, the Saito 65, the 12 x 6 propeller and Tufnol engine mount weighed 26 1/2 ozs. The bare airframe, uncovered, no engine etc, or radio, but including engine bearers u/c & wheels only weighed 26 ozs !! It flies really nicely but I shall have to work on the 65, it's as dull as a 40 four stroke.

Last but not least is a Spad X111 I made for Bob Munn in the USA as a "thank you" for his previous kindness (he did us proud when we stayed with him & Ethyl in 1994). It's only 13" span and I put a load of detail in it as it is a mantlepiece job. It's only one ounce but too heavy to fly as a peanut, not only that, the rubber motor can't go through the seat ! Well. I hope you like these. John French, Yataia, Queensland
Sorry to rub it in, but a word about the weather up here at the moment. Beautiful !!! Best wishes, John.

Letter to the Editor

From Merv Buckmaster, 9 August 1998

Dear Peter, Thanks for the Jul - Aug issue of The Thermaleer. With regard to the article about thermals... Don't believe everything you find on the internet. There is a tendency to do so, but it is only an electronic newspaper, and who would trust a newspaper ?
As far as this article is concerned, I found only one mistake in that thermals drift more slowly than the wind, due to their inertia. Some other points are glossed over. There is a more informative article in the 1990 Aeromodelling Digest. Written by a free flighter and RC glider flyer. And there is a more recent article in the OSW column in Airborne No. 159 on page 48. OT flyers should know these articles by heart - well almost !

I have just recently finished a KG2 Cabin and it flys well with an ASP 65 FS. Weighing about 3.4 kg for its 12 sq feet of wing area. Best wishes with your new job. Yours The Baron (aka Merv Buckmaster).

Editor's Note: Merv Buckmaster has kindly agreed to reproduce the two articles named in his letter. They will appear in subsequent issues of "The Thermaleer".

Engines for Sale

~~*ATWOOD CHAMPION (VGC)*~~	~~*$350*~~ *(sold)*
O/R 23 S/PORT (091102) (G)	*$140*
O/R 19 S/P RARE IN OZ	*$100*
O/R 23 S/P (13055) loose intake	*$120*
O/R 23 FRV (425670) (VG)	*$175*
O/R 23 FRV (low comp)	*$120*
O/R 29 FRV (as new)	*$200*
O/R 60 S/P (E)	*$200*
~~*SUPER CYKE (G)*~~	~~*$200*~~ *(sold)*
FORSTER 29 (14075) (G)	*$175*
FORSTER 29 metal tank	*$125*
(cracked timer housing)	
FORSTER 35 FRV (as new)	*$225*
MADEWELL 49 FRV with tank	*$220*
MADEWELL 49 FRV	*$80*
(some work required or ideal for spares)	

All motors fitted with a spark plug, contact -
DENNIS PARKER** on **(03) 9570 2794

Editor's Note: Dennis Parker was an original member of SAM 3000 which was changed to 1788 by special permission of SAM to mark our Bicentenary. He served on the original committee and was Editor of "Duration Times". Dennis is still active in free flight with the Victorian Free Flight Society (VFFS).

Ramblings - by Don Howie

At the end of June I made a visit to Sydney for a few days. Not wishing to drive in Sydney, I went by air and stayed on the North Shore. Being a Senior, gave me cheap travel on public transport, so I proceeded to visit some of the popular model shops that Sydney has to offer. Taking the ferry from Cremorne Point to Circular Key, I then caught the double level train to Liverpool, after waiting only a couple of minutes.

Only a few minutes walk from the station, I was at Kellet's Hobby Supermarket, which I knew would keep me occupied for an hour or so. I thought back to my childhood days when my parents would take me to Melbourne to stay with my Aunty in Elwood.

The things I remember most was visiting Hearn's Hobbies, my favourite hobby shop in Melbourne. I think the other shop was Riverside Hobbies, also near the bridge onto St Kilda Road. Later, when I became interested in radio control, the Model Dockyard was the place I would visit in Melbourne.

During the last ten years, electric models have been one of my interests, also old timer electric models. Anyone who has visited Merv Buckmaster's home near Benella, will know that he flys from his backyard. When I had a visit from Merv, I took him flying a couple of streets away on the ovals used by the two schools in the area. Only difference was that I flew electric models to avoid noise problems. Electric flying is fairly popular in Sydney, I expect so they can fly on school ovals, so avoiding long travelling time to a flying field for power models. Kellets had a MFA gear reduction unit 2.3 to 1 for speed 400 motors, and priced at less than $23.00, it is good value for electric flight models. The other shop I went to was Wings "N" Things and obtained more electric goodies.

Perhaps the most enjoyable part of the trip was a visit to the home of Alan Wooding in Birchgrove. Again the Sydney ferries go from Circular Key to Birchgrove (Yurulbin Point), a very pleasant scenic trip. Alan is a practical modeller, who uses sparkies and is not a collector. Unlike the writer, he does not go below 60 size engines, as the larger sizes are easier to handle and are more reliable. His Forster 99 was a prewar original that used the large round timer and the same casting for the exhaust and the intake. He calls this a large Mills .75. His original Orwick 64 he obtained from George Aldrich shortly after George's visit to Australia. Alan thinks it best to buy motors that are "as new" in the MECOA grading. I think Alan is right, as I have spent considerable sums buying replica parts and getting new parts machined. The only advantage is that you do not outlay all the money at once, so it seems not to cost as much.

About the only way to afford a good sparky from the USA at present, with the low value of the Australian dollar, is to trade a valuable motor. Some time ago I traded an OS K6 on an Anderson Spitfire 65. The Anderson was as new with spark plug and $300 USD, The allowance for the K6 was $200 USD and we both paid the postage. Remember that anything you trade in the USA is now worth more. Alan considers the Spitfire 65 the Rolls Royce of engines.

The New Rules

SAM 1993 have attempted to run several contests to the new 1998 MAAA Rules. Texaco and Nostalgia was cancelled at Constellation (S.A) in July, due to wind and rain. Texaco is not really new to the South Australians and Victorians who have flown at Swan Hill (Vic) at Easter, over previous years.

An event was run at Willgunga Vintage Modellers field on the 19th July for 1/2 A Texaco and Open Duration. The 1/2 A event was more enjoyable, as we all flew at least one more 6 minute round each. We still had 6 flyers in the fly-off from the eight contestants. Ron Adamson was down to 17 seconds with the Nelson 40 Q500 motor in his 85% Bomber. It would be interesting to see if the Q500 motors are still competitive in the event.

The writer and Bob Watson went the 4 stroke route getting 28 seconds engine run. Recent testing with the light weight wing on the 85% Bomber had shown 9 to 10 minute flights in low thermal air. Bob had the Saito 65 / Kerswap combination that has worked in the past few years. Bill, as usual, was the only flyer with a new model built to the new rules. It must seem boring, reading about Bill all of the time. However Bill seems to turn out a new Old Timer every month; unlike the writer who may take up to a year to produce something new. Anyhow, the new model was a Spectre, built to the 170 square inch rule, powered with a Series 20, McCoy 60, Antique Glow. He had worked out that the 30 second engine run for the McCoy would make it very competitive. Rex Brown had the same idea, as he had fitted a McCoy 49 to his "Folly 2", also running on glow.

The day was fairly windy at altitude with good lift, at times I had full down elevator trim to stop going backwards. I think Bill Britcher got the highest, followed by the four stroke models and then the Q500 models. All this at the end of the engine run. After four rounds only two made the fly-off, Bill Britcher and Ron Adamson. Ron landed after 8 minutes 33 seconds, Bill making 10 minutes 3 seconds to win the event.

In conclusion, Bill's McCoy in a 170 square inch model is very competitive, but not outstanding. Most think that it will become a 4 stroke event. The modified)S 61 with larger intake valve is a very potent motor, but not flown on the day. The new YS 53 is another motor that is said to have great potential for the 4 strokes.

Epoxy Resin and Allergies

This is an edited summary by Franklin Peale of a paper on the safety of epoxies (Occupational Medicine 9:97-112 (1994) R. Jolanki, L. Kanerva, T. Estlander, and K. Tarvainen).
The summary was posted to the RCSE list by Franklin Peale on 28 Jan 1997.

Chemical Link

The component most commonly causing an allergic reaction is the resin. Between 2-4% of people not employed in the epoxy industry will have a positive skin test to the resin component. A higher percentage of workers in the epoxy industry test positive to allergic dermatoses [skin reactions].

Some formulations of epoxy acrylates (aka vinyl esters) used in dental work and printing have lead to contact allergies. Unpolymerized resin, diluent and hardener are the offending agents, but measurable amounts of unpolymerized reagents remained in some "cured" resin after 1 week.

As well as causing allergic skin reactions, the polyamine hardeners, being very alkaline (pH 13-14), may cause chemical burns. Diluents and hardeners, being more volatile than resin, may more readily cause allergic reactions from vaporization (as well as by direct contact).

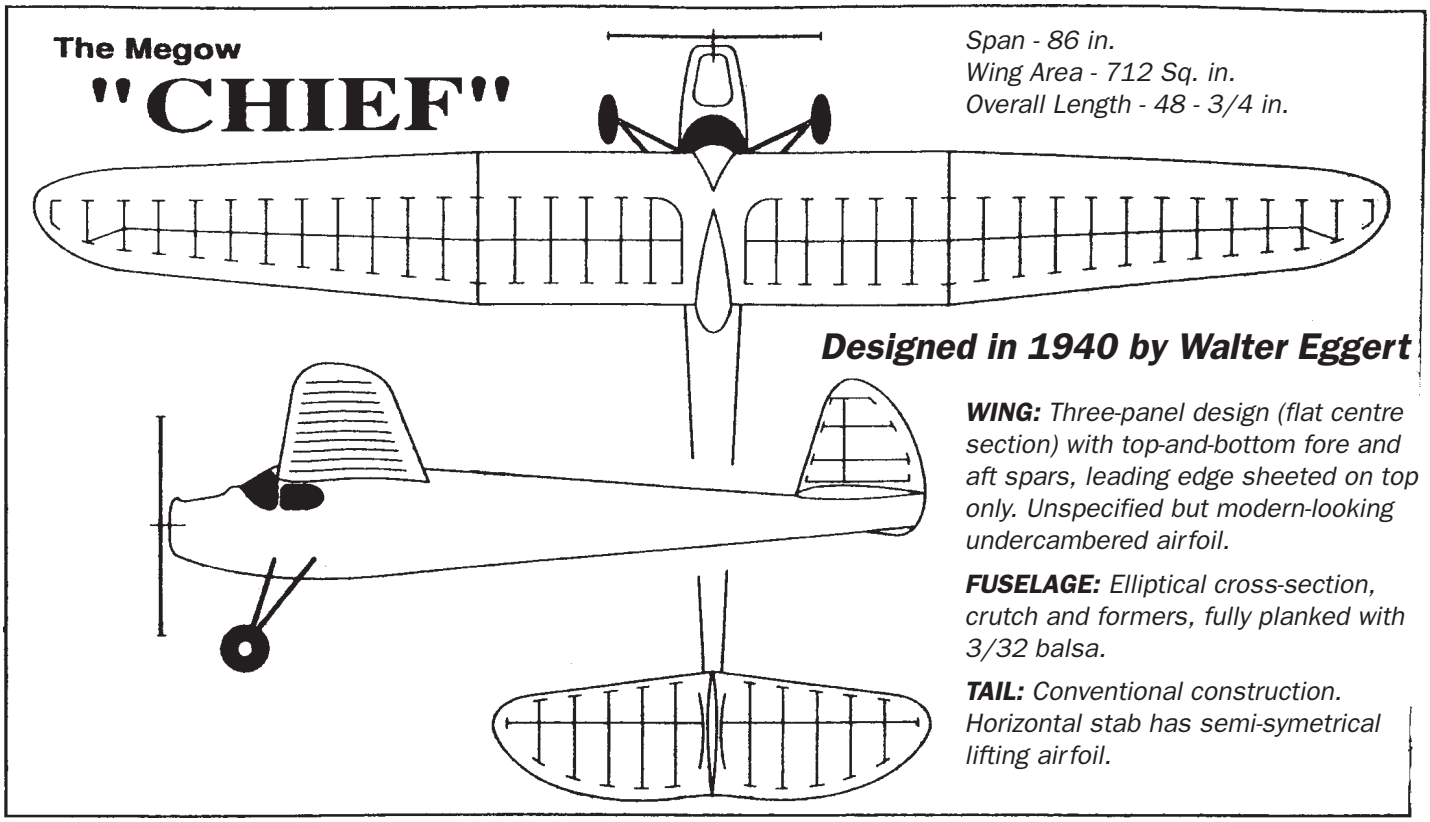
Risks

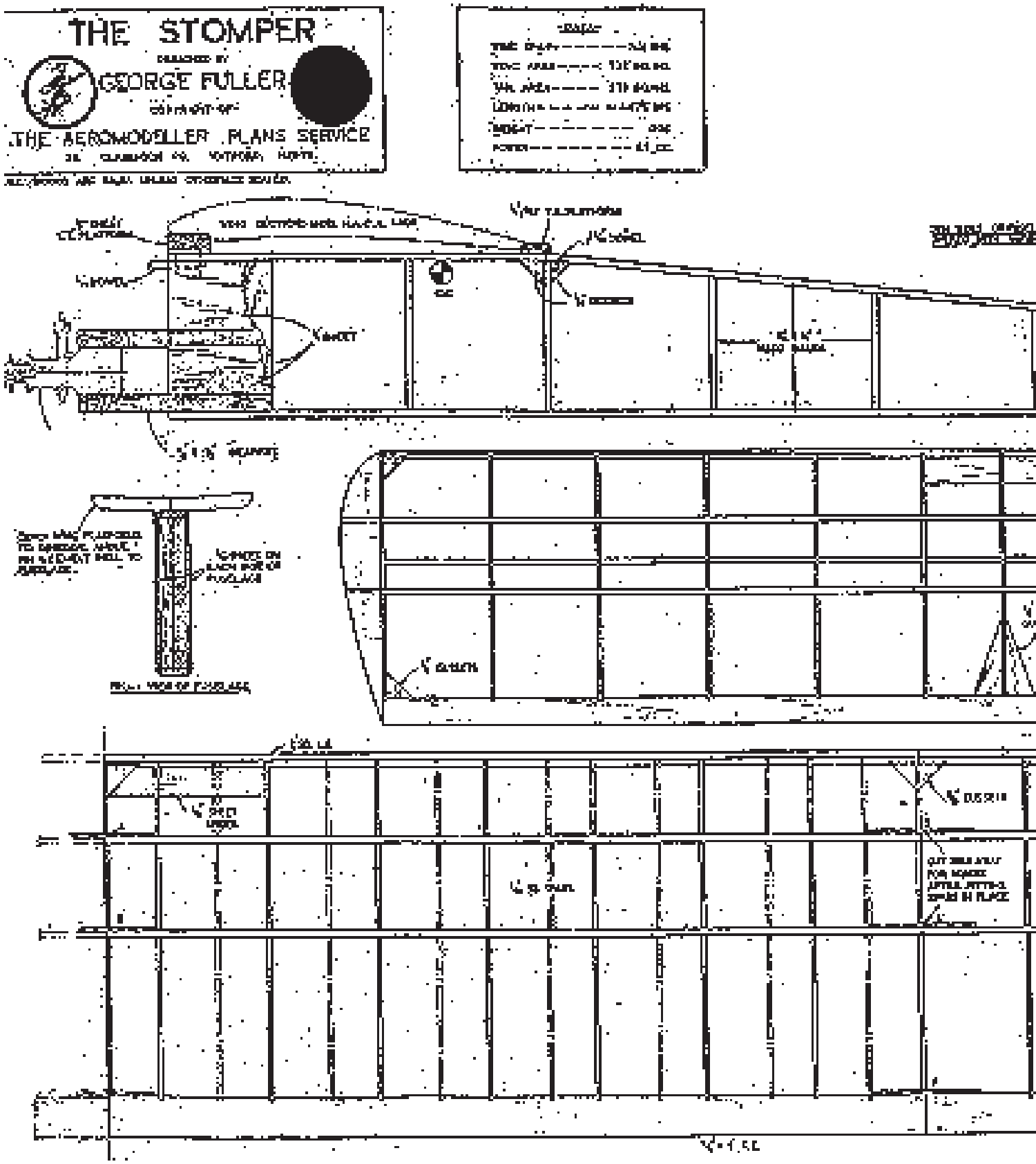
Likelihood of developing an adverse reaction increases with the amount and concentration of epoxy resin used, frequency of skin contact, and area of contaminated skin. Rubber gloves are not completely impermeable to the chemicals involved, but help to minimize contact.

I find no references to fatal allergic reactions, but the usual skin reactions (and respiratory symptoms) are of the "anaphylactic" type. The occasionally fatal allergies to bee stings or seafood are of this type, it is not out of the question that for a rare person, exposure to epoxy resins would be a life-threatening situation.

References

There is a well-illustrated Web site describing the detailed chemistry of many resins and composites (but not vinyl esters) at http://www.psrc.usm.edu/macrog/index.html A Medline literature search on "epoxy" and "allergy"/ "allergic" yields scores of references. There is a concise review article on epoxy dermatitis in "Occupational Medicine" 9:97-112 (1994). For the cost of reproduction and mailing, I will send a copy to folks who want to read it themselves, but I'll summarize most relevant points. (Last updated May 05, 1998)




THE STOMPER
GEORGE FULLER
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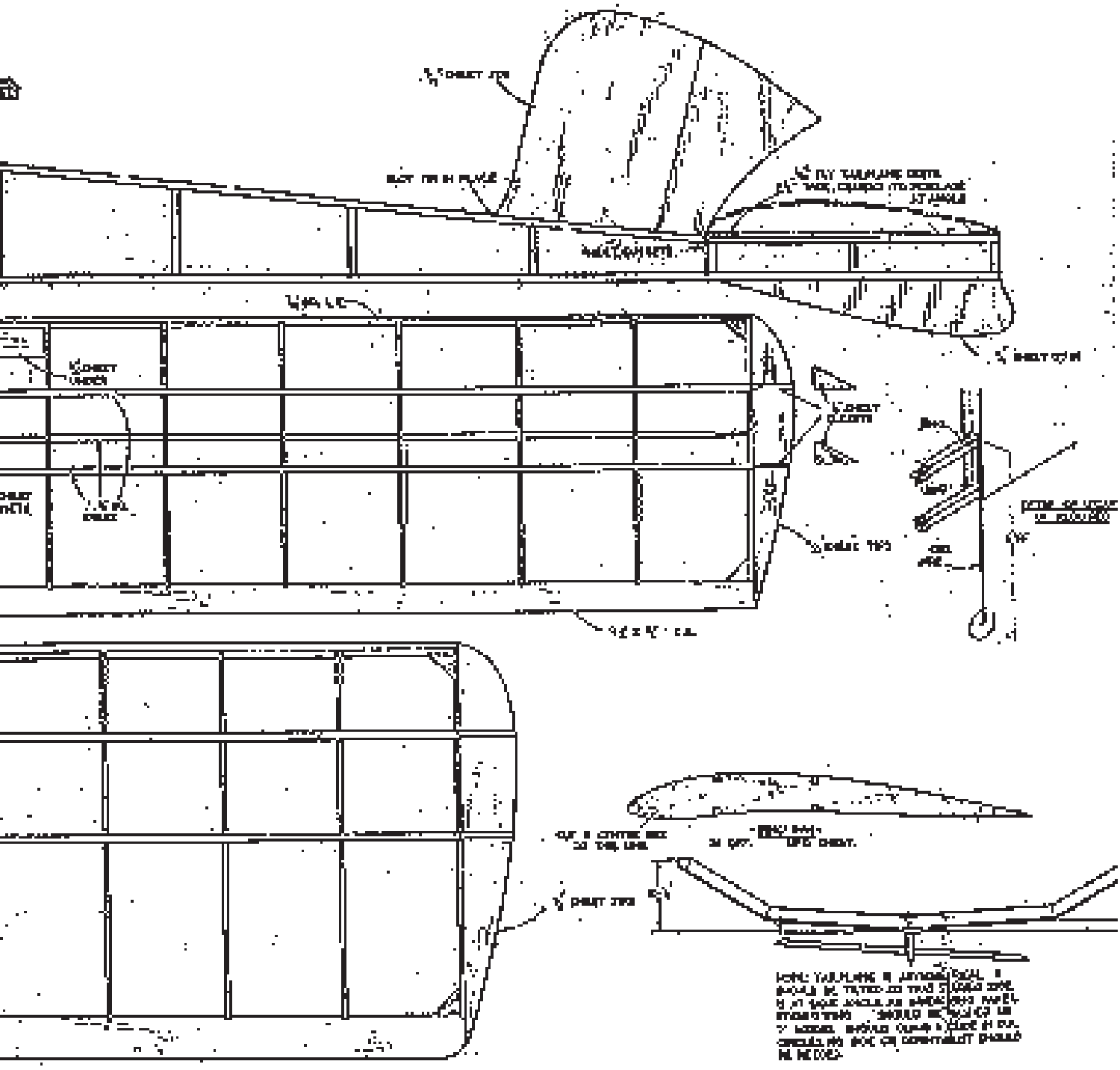


TYPES OF LIQUID FUELS

(Continued from Newsletter #54)

Liquid fuels for internal combustion engines are of two fundamentally different types, namely those to be fired by spark or hot wire ignition and those designed to ignite under the heat of compression alone, without the application of a spark or other local hot spot. The former fuels, of which petrol is the commonest example, should contain a low boiling fraction (the "light ends") of low Flash Point to ensure starting from cold, but must have a high SIT to prevent firing taking place under compression alone before the spark passes. The second type of fuel, for use in Diesel engines, need not possess a low Flash Point but must have a low SIT. It follows that a good petrol fuel will be a bad diesel fuel-and vice versa.

MINIATURE DIESEL FUELS

The Diesel Fuels used in road transport vehicles are fairly high boiling fractions from natural petroleum consisting mainly of certain types of "paraffinic" hydrocarbons. Such a "gas oil" has a Spontaneous Ignition Temperature (SIT) around 250 Deg C' and when forced into the cylinders in finely atomised form will fire satisfactorily under the high temperature, conditions prevailing in these very high compression full-scale engines. But they will not ignite in a model "Diesel" unless it is hot, and to enable miniature compression ignition two stroke engines to be started it is customary to add a proportion of Ethyl Ether, which combines the phenomenally low SIT of 188 Deg C. with very wide Explosive Limits.

Since the miniature "Diesel" is a two-stroke engine, lubricant must also be incorporated in the fuel. Finally, to ensure a smooth even running it is often advantageous to include a small proportion of a further component, the "dope". It is worth while to study in some detail the functions and properties of these four vital components.

(1) THE PARAFFINIC BASE FUEL.

This is the main ingredient of the fuel. Its function is to provide most of the energy of the fuel, and it should therefore possess high Calorific Value and low SIT. Reference to Table III will show that, with the exception of certain ethers, the only readily available substances with relatively low SIT's are the paraffin hydrocarbons; which fortunately also possess very high Calorific Values. Ruling out individual pure hydrocarbons like pentane, hexane, heptane, etc., on the grounds of expense, this virtually narrows down our choice of base fuel to PARAFFIN OIL, COMMERCIAL DIESEL OIL and special HIGH CETANE GAS OIL FRACTIONS, if available. There is little to choose between paraffin and diesel oil, the latter having its higher viscosity and greater "oiliness" to recommend it.

It can be seen, partly by reference to TABLE III, that the addition of petrol, benzene, toluene, naphthalene, turpentine, white spirit, or in fact any of the fantastic materials that have from time to time been recommended, must of necessity make the fuel worse, because of the high SIT's of these substances. Their use to "deaden down" the detonation of the ether is a case of two wrongs failing to make a right. A fuel that needs deadening down has got too much ether in it.

(2). THE LUBRICANT.

The lubricating component of the fuel may be any good quality lubricating oil, either mineral or vegetable. The only limitation imposed by vegetable oils like Castor Oil is that, alone, they will not blend with paraffin base fuels; castor oil can be used only in a fuel ready mixed with ether, which will keep all the components in solution. There is scope for experimenting with different grades and qualities of oil. With regard to the quantity of oil to incorporate in the fuel, this again is a matter for experiment.

Many miniature engine fuels are grossly over lubricated, with the result that they are unnecessarily messy in use, and also require more ether than they otherwise would. In designing a diesel fuel it should be borne in mind that the oil has one function only to provide adequate lubrication and that it should not be expected to burn, to moderate the explosive tendencies of excess ether, or to do anything else. A two-stroke motorcycle engine runs on the road for long periods at a time under much greater (and varying) load than any model engine, and with considerably greater bearing and piston speeds, yet seldom (does the percentage of lubricant in the fuel exceed 7.5%. It is desirable in formulating a model diesel fuel to increase this proportion for the following reasons:-

1. a new engine may have tight spots and require excessive lubrication till it is run-in;
2. in a very old, or badly made engine, the piston may be a poor fit in the bore, so that a fairly thick

viscous fuel is needed in order to seal the compression; and
3. the manufacturer must allow a reasonable safety factor. Point 2 normally affects only the case of starting, once the engine has been started it will usually continue to run perfectly satisfactorily even on a very thin fuel. With old engines starting can usually be facilitated by injecting a drop or two of lubricating oil through the ports. For a normal fuel for use in a run-in engine in good condition, oil percentages in the region 30% to 50% are unnecessarily high. If the aeromodeller experiments with proportions of oil in the range 12%-20% for racing blends and 20%-30% for general purpose and running in fuels, he will not go far wrong. Diesel oil based fuels tend to require rather less than those blended with paraffin.

(3). ETHER.

Apart from its low SIT, which enables it to start easily, and its wide Explosive Limits, which ensure that throttle settings are not critical, ether is a bad diesel fuel. It has a considerably lower Calorific Value than the paraffinic base fuel and it detonates or "knocks" badly. Excess of ether means correspondingly less base-fuel in the formulation, and hence a fuel of lower calorific value than need be, whilst its detonating propensities when present in excess cause diesel knock and impose undue strains on the con-rod.

Ether should therefore, he added to a diesel fuel for one purpose only, namely to make the engine start. Just enough for this purpose should added and no more. 30%-35% is excessive, and modellers are recommended to experiment in the range 20% 30%. It cannot be over stressed that the function of the ether is solely to bring about easy starting; it should not be expected to usurp the function of the base-fuel. There seems to be some confusion regarding the grades of ether suitable for use in fuels. Ether is manufactured from ordinary ethyl alcohol, two molecules of which join together, with the elimination of water, thus:-

C2H5 -O -H +H O - C2H5 ----> C2 H5 - O - C - 2H5 + H2O
2 Ethyl Alcohol 1 Ethyl Ether Water

The process is usually carried out by, heating the alcohol with concentrated sulphuric acid, which absorbs the water formed which is why the product is sometimes called "sulphuric ether". The ether, which distils over is washed free from acid, purified, dried and re distilled. It therefore contains no acid whether is sold as "Anaesthetic Ether", "Ether 720", "Ether BSS 759", "Sulphuric Ether" or "Ether Meth". All these materials are, effectively, the same thing; and if properly manufactured are all harmless to model to model engines.

The 720 refers to the specific gravity of the product and shows the substantial absence of water BSS 579 refers to the appropriate British Standards Specification laying down the standard of purity; "Ether Meth." indicates that the Ether was not manufactured from pure ethyl alcohol but from methylated spirits, which contain a few percent of methanol this will give traces of methyl-ethyl and di-methyl ethers in the product, which are not harmful. Anaesthetic ether is made from pure alcohol and usually contains a proportion of deliberately added alcohol, and sometimes other additives, to prevent peroxide formation on storage. It is more expensive than other grades and, if anything, is slightly less suitable for fuel work.

The di-ether, Methylal, with the chemical formula CH3 - O - CH2 - O - CH3 may be used partly or wholly to replace ethyl ether in certain specialised fuel formulations. 'The higher ethers Amyl Ether and Butyl Ether are too high boiling to valuable alone, but may be used mixed with ethyl ether. Isopropyl Ether, unlike the straight chain ethers above, has a very high SIT and is not suitable for use in diesel fuels. It is a possible ingredient of glo fuels.

(4). DOPES.

There are a number of well recognised "dopes" which may be added to diesel fuels, best known of which are Ethyl and Amyl Nitrites, Lethyl and Amyl Nitrates, b-Chloro-ethyl Nitrate, Paraldehyne. Various organic peroxides like Tertiary Butyl Hydro-Peroxide, Di-Tertiary Butyl Peroxide, etc.
The choice of dope is usually determined by price and availability. The function of dope is to reduce "Ignition Lag" and thereby give smooth powerful running. Very little dope is needed for this purpose, the precise amount depending on the particular fuel formulation, and is a matter for experiment in each case. Seldom is more than 3% required, and modellers would be well advised to start with about 1% of dope and gradually increase by not more than 1% at a time up to a maximum of about 2.5%, until smooth even running is obtained and then to STOP.

An Appreciation of CH Grant - Part 2

by Alex Imrie (Aeromodeller July 1987)

When Dayton-Wright decided to build an entry for the 1920 Gordon Bennett air race, Howard Rinehardt of the design team, appreciating Grant's knowledge of aerofoil behaviour, approached him for advice on wing construction. A very clean monocoque-fuselage, cantilever variable-camber wing monoplane with retracting undercarriage was the result of this association. The wing was made in three sections-, the full-span leading and trailing-edge portions (which were solid balsa wood covered in thin three ply) being coupled to the undercarriage mechanism so that at slow speed with the wheels

Above: Fifteen-year-old C H Grant with his eighth successful model, an A-frame twin pusher that was capable of 1300 feet flights. This photo was taken at Peru, Vermont In 1910 toy his mother who did much to encourage his aeronautical interest.

down the leading and trailing edges drooped to give a high lift aerofoil section; and when the wheels were retracted the associated linkage raised the drooping portions of the wing to present an aerofoil section designed for high-speed flight. The undercarriage/ variable camber operation was via a single manual crank in the cockpit, like that envisaged for the 'Grant Fast Scout' of three years earlier, but the wheels on the Dayton-Wright RB-1 retracted into fuselage wells. The whole machine presented a very advanced approach to the problem of high-speed flight; the main features mentioned above are standard aeronautical practice today. It is hard to understand why Grant, who had numerous patents protecting his model aircraft designs at the time, did not see fit to patent this variable camber wing.

Model mass production

Despite his involvement with full-size aviation C H Grant spent all his spare time experimenting with models. His tractor designs in particular flew with great stability; their excellent performances for the time were without doubt because of the carefully-fashioned sheet balsa flying surfaces.

The end of the war saw Charles Grant possessed of two main objectives: promoting safety in flight, and endowing aeronautical knowledge to young people via the medium of model aircraft. He had already established business contacts in Dayton and on leaving military service in 1919 a number of ready-to-fly models and sets of parts were marketed, manufactured by the Ritchie-Wertz Company:

Known at first as 'Right Fliers' these were by 1920 named 'Riteflyers'; both names, of course, being plays on the aeronautical connotation of the name 'Wright'. When introducing the would-be customer to balsa the company's 1919 catalogue stated that a very rare and light wood was used in the construction of the models to provide strength and flexibility and to overcome the necessity of covering with tissue paper or silk. Balsa wood had first appeared on the model scene as early as 1911 when John Caresi, a leading New York model builder found this material in the Long Island City Docks where it had arrived after having been used as packing for mahogany logs transported as deck cargo. Its use in the Grant-designed models mentioned was probably the first extensive commercial use of this now universally-used model aeroplane material.

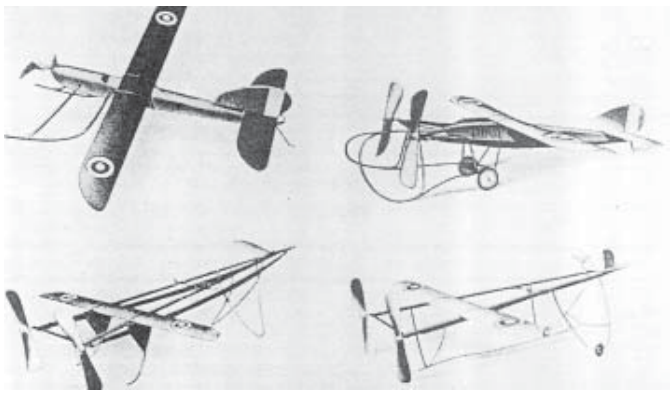
Charles Grant's fertile mind had also produced the woodworking machinery that resulted in correctly cambered aerofoil sections being machine cut into the solid balsa wing blanks. The tractor models, some of biplabe configuration and having two propellers, were well presented, with enclosed fuselage and colourful insignia, but they were not cheap, ranging in price from $3.75 to $20.70. The business was a great, if short-lived success. At one time 1000 models per day were being produced, but the financiers' neglect to pay the agreed patent royalties heralded the end of this venture in 1921.

Youth Training

Following the termination of the full-size and model work in Dayton C H Grant and his wife Lillian returned to Vermont where they organised and ran summer camps from 1922 until 1933. For a short period every year, some thirty teenage boys were given basic training in health fitness, character building and instruction in aerodynamics. This popular course, which was termed "The Boy's Camp of Model Airplane Building and Designing" was at a Peru location named Camp Duncan Grant in memory of his brother. A number of the students were to make names for themselves in model aeronautics, among these being Howard McEntee, Joseph Kovel and Dr Walter Good; and some fifty years later Grant was still receiving grateful letters from many who had been lucky enough to be participants at these summer camps.

The Grant Aircraft Company

Following the increased interest in aviation that resulted from Lindbergh's epic solo flight from New York to Paris in 1927, Charles Grant again ventured into the commercial side of model aircraft when in 1928 he formed the Grant Aircraft Company to produce all-metal ready-to-fly tractor fuselage models. Precision stamped from medium-hard aluminium sheet six thousandths of an inch thick, components were ribbed to provide stiffening and were correctly proportioned with built-in incidence and dihedral; the idea being to present a complete model aircraft that would perform satisfactorily for enthusiasts who possessed no modelling knowledge. There were initial financial difficulties but the products were so good that they were taken over by the well-known toy makers Kingsbury Manufacturing Company of Keene, New Hampshire, in 1929. The future of the Silver Arrow models appeared to be assured but the beginning of the Depression following the Wall Street crash of October 1929 forced the company to close down.



Above: Four Grant designs that were manufactured by the Ritchie - Wertz Company In 1919. These are thought to be the first commercial models to make extensive use of balsa. The twin-propeller tractor at top right was also available as a biplane; It sold at $20.10.

Editor of Model Airplane News

MAN first appeared in January 1929. After a hesitant start it slowly gained momentum although tending initially to concentrate on the state of the art as generally practised in the New York area, seemingly being unaware of the many new and advanced models that were being described in other magazines such as 'The American Boy and Boy's Life'. It was not until Charles Grant became editor in 1932 that new thought and improved model designs appeared.

Under his leadership the club movement flourished and the magazine went from strength to strength, providing readers with informative articles on model aircraft design and constructional techniques. The explanations encompassed in Grant's own articles on model aerodynamics provided practical solutions to the problem of tractor stability, thus sounding the death knell of the twin-pusher as a standard contest model.

Petrol-engined models began to appear; Maxwell Bassett swept the board at early events although his models obviously lacked spiral stability, but this was compensated for by the fund of knowledge and very careful trimming techniques that Bassett had developed. Grant was able with his famous KG design to solve the gas model stability problems that beset early power modellers.

In 1936 he formed the International Gas Model Airplane Association which was sponsored by MAN; news of members and their models appeared in a presentation called 'Gas Lines'. This organisation was probably responsible more than any other factor for increasing the popularity of gas models up to the end of 1937, by which time it numbered some 4500 members. C H Grant worked for the official recognition of the IGMAA and when this was obtained as the National Aeronautic Association Gas Model Division it gave added impetus to the standing of the then-young Academy of Model Aeronautics.

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"The Thermaleer" is the official newsletter of the **Victorian R/C Old Timers Association (SAM 600) Inc.**

The Thermaleer

SAM 600 of Australia Newsletter

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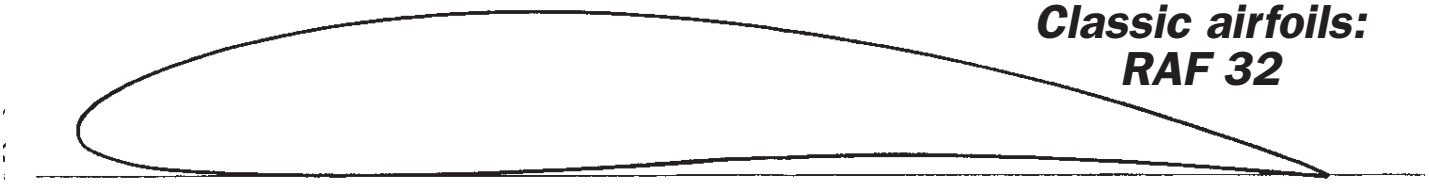

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Lower...	3.42	1.50	0.88	0.30	0.00	0.30	0.70	1.10	1.46	1.60	1.46	0.92	0.12