DURATION TIMES

Newsletter No. 191 November-December 2014

Seasons' Greetings to all SAM 1788 Members and Friends.

From Terry Bond, President, NSW Free Flight Society.

Hi, You and your family are invited to see the New Year in at West Wyalong.

The Event: New Year celebrations and Open Days. **Location:** The AB Field at West Wyalong

Dates: 29 Dec 2014 to 1 Jan 2015 **Address:** 1390 Clear Ridge Road, West Wyalong

The Plan: To have fun and fly. All modellers are invited but if you are interested please get in touch with Roy Summersby (02 4341 0072) and tell him you are coming.

Accommodation is available on the field and in the house at $10 per day. Matt and Donna will be staying in the house and have their own bed organised. Bring a tent, a caravan or stay in the house. Book early!

The inaugural information booklet is available in the house compiled by Donna Gray.

We hope to have local visitors come by between 7.00am and 1.00pm, to fly all types of flying models.

NEW year's eve Party and Get together.

A.B. Field West Wyalong 29 Dec 2014 to 2 Jan 2015

Hunter Valley Championships

7th and 8th March, 2015.

MUSWELLBROOK

R/C Oldtimer Competition Events

Saturday: * 10am Start - Oldtimer Glider then Nostalgia.

Sunday: * 9am Start - Tomboy 30 Minute Scramble, ½A Texaco then Texaco.

BBQ both days for breakfast and lunch - Drinks, Tea & Coffee available all day.

Check the web site for entry fees, rules and other information regarding this great weekend

www.mdmas.org.au

For further information contact:

Grant Manwaring 02 6241-1320 Email: grantandmary7@gmail.com

ORANGE MODEL AIRCRAFT CLUB Inc.

INVITES YOU TO ATTEND AND COMPETE FOR THE

ALAN BROWN

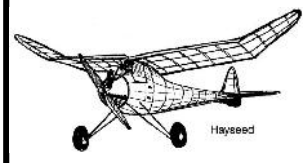
Perpetual Memorial Texaco Shield

On the Weekend

31st January and 1st FEBRUARY, 2015.

At the

ORANGE MAC FLYING FIELD at BORENORE



Saturday 31st - Commencing at 10am - Gordon Burford Event

Commencing at 1.30pm - Oldtimer Duration

Sunday 1st - Commencing at 9.30am - ½A Texaco then Texaco

(All events will be flown to 2013 MAAA Rules)

For Information contact: Dave Brown - Telephone 02 6355-7298

Duration Times is the official Newsletter of SAM 1788
SOCIETY OF ANTIQUE MODELLERS OF AUSTRALIA 1788 Inc.

President:	**Peter Scott**	**44 Ravel Street, Seven Hills. NSW. 2147.**	**02 9624-1262.**
Vice President:	**Jim Rae**	**40 Garden Circle, Merimbula. NSW. 2348.**	**02 6495-3530.**
Secretary:	**Grant Manwaring**	**7 Arthaldo Court, Nicholls. ACT. 2913.**	**02 6241-1320.**
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Newsletter:	**Ian Avery**	**17 Kalang Road, Kiama. NSW. 2533.**	**02 4232-1093.**

Committee Members: Basil Healy, Ian Connell.

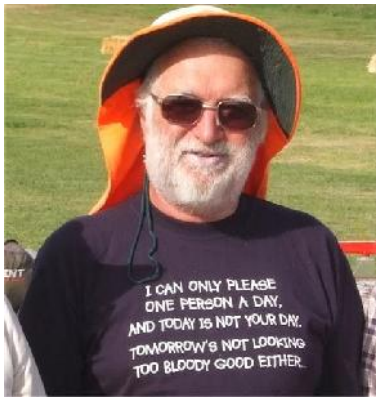
Email for Duration Times - iwa@iinet.net.au

Oldtimer Events for 2015

January 31 - Feb 1		Alan Brown Memorial Shield	Orange	Dave Brown	02 6355 7298.
March	7 - 8	Hunter Valley Championships	Muswellbrook	Grant Manwaring	02 6241 1320.
April	2 – 6	SAM 1788 Championships	Canowindra	Grant Manwaring	02 6241 1320.
May	2 – 3	Veterans Gathering	Muswellbrook		
May	16 - 17	Wyong Old Timer Weekend	Wyong	Bob Marshall	02 4363 2818.
June	6 – 7	Vintagents Old Timer Meeting	Gratton Field	Dave Paton	07 3245 5991.
June	13 – 14	New England Gas Champs	Tamworth	Basil Healy	02 4341 7292.
July	18 - 19	Golden West Old Timer	Parkes	Peter Smith	0423 452 879.
August	29 - 30	Oily Hand Weekend	Cowra	Andy Luckett	
Sept	5 - 6	Coota Cup	Cootamundra	Grant Manwaring	02 6241 1320.
October	3 –4	Eastern States Gas Champs	West Wyalong	Grant Manwaring	02 6241 1320.
Nov	14 – 15	Belconnen / NAAS Old Timer	NAAS, Canberra	Grant Manwaring	02 6241 1320.

Notes: There are a couple of date changes from the draft calendar published in Duration Time. If you have entered the dates into an electric diary please check.

Wyong and Belconnen / NAAS meetings will also include electric events.



From the President:

Wishing you all Season's Greetings and a healthy and happy New Year.

We went to Yass and had a good time in spite of weather forecasts not being good. Two enjoyable social evenings made up for a no fly day on Sunday. Saturday, however was a good flying day. I won Duration without getting one max!! I also got into the Burford fly-off but had a terrible flight in that.

The committee held a meeting and mulled over issues and events both past and in the future. On getting home we mulled some more, on flier numbers, and getting more people interested in the old timer movement. It seems to me that apart from Canowindra, which has always been good, the only other events that do really well for fliers are the Veterans Gathering and the Oily Hand Day. Both, depending on the weather do really well. So, how about this:

Options – We run a fun fly weekend, possibly at Cootamundra or West Wyalong. Fly what you like (suggestions please) Control Line, Free Flight (better at West Wyalong) with a social, open-air BBQ on Saturday night. NO COMPETITION. Older model types preferred but not essential.

Either, or and – Pick two competitions in the year that have suitable facilities for control line – Tamworth? Hunter Valley Champs? – on the Saturday we have a fun-fly (include Scramble in this – R.C. and F.F. combined) control line and any design 50years or older. On Sunday fly two or three comps – easy to fly comps that encourage newcomers – say ½ A, Texaco, Burford. Run two out of three rounds.

At any of these events, on the non-competition days a simple to fly Texaco model will be supplied. I will donate an 80% Bomber and a 70% Bomber and the radio with a large board saying:-

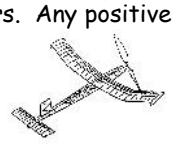
~ Come on ya mug – see how long you can keep it up!!
~ Same fuel allotment, or time . Land on the field to get a score.
~ Highest score at the end of the day gets a prize.

The board will give the scores and what you have to beat. Fairground stuff but good fun. Maybe a small fee to have a go.

I have done my best in the past to bring back the fun element into the Old Timer scene – Phantoms, Tomboy, Scramble, free flight – but with our aging membership and low turn-out at competitions we have to enthuse others. Any positive comments welcome.

Jim Rae has had a new hip and should be with us at Orange.

See you there,
Peter Scott.



SAM USA changes cut-off date to the end of 1950 and limit wingspan to 120 inches for scaled Antique and Oldtimer Models.

Those who subscribe to the USA SAMSpeaks magazine will be aware of the fact that 6 Proposals to change the USA SAM rules were recently voted on this year and will come into effect on 1st January, 2015.

Newly elected SAM USA President Allen Heinrich has advised in SAMSpeaks No.240 that all six proposals have passed by a high margin.

Proposal 1 and 3 directly affect RC Antique and Oldtimer models and could or should be considered for adoption by the Australian Oldtimer movement.

Proposal 1 dealt with the cut-off date for oldtimer models in USA. The motion to change this rule read:

"Proposal 1, if approved, would extend the date of Old Timer model designs through 1950 and include all Post '42 designs with ignition-on-the plans as Old Timers. Rule Book paragraphs affected would be: FF Section I, par. D, page 1, FF Section II, par. 2, page 2, FF Section III, par. 4, page 6, and RC Section I, par. A. I, page 15.

Proposal 3 dealt with limiting wingspan of scaled Antique and Old Timer models. The motion to change this rule read:

"Proposal 3, if approved, would limit the wingspan of all scaled Old Timer and Antique models to a maximum of 120 inches"

Since the proposals were made various comments were printed in SAMSpeaks including, in favour, that moving the cut-off date to the end of 1950 would bring SAM USA in line with other SAM Chapters in UK, Europe and other countries.

Other comments, also in favour, stated that 1942 was originally chosen to allow the reproduction and selling of model airplane plans without infringing on the 25 year conpyright protection laws in effect in 1967.

Another comment, in favour, pointed out that folks born in 1942 probably didn't start building models until 1950 and they are now 72 years old and didn't cut their teeth on oldtimer models. Also it will bring the dates for defining engines and models within a year of each other.

There was little, if any, comment against rule Proposal 1.

Comments on rule Proposal 3 to limit scaled Antique and Old Timer models wingsopans to 120 inches included, in support, old timer models should comply with FAI and AMA rules Against, large models are easier to see at height and improve our image with prospective members as RC modelling generally is moving towards large models.

However, as mentioned above, all proposals to change the SAM USA rules have been approved and therefore the cut-off date for all oldtimer models is now 31st December, 1950, and the wingspan of all scaled Antique and Oldtimer models is limited to 120 inches.

Previous SAM USA President Ed Hamler apologised in SAM-Speak magazine No.239 for any confusion by the wording in Proposal 1. "The purpose of the proposal was to extend the eligibility date of Old Timer designs from the end of 1942 to the end of 1950. The reference to include post 1942 model designs with ignition-on-the-plans may be ignored since all known models with spark ignition components shown on the plans were designed prior to 1951. The reference is redundant and will be deleted from the rulebook definition of Old Timer designs should the proposal pass."

What should happen to the Australian Oldtimer Rules?

1. The fact that the Australian Rules were originally based on the SAM USA rules and adopted cut-off dates in line with those rules then Australian Rules should be updated to reflect the new cut-off dates for old timer models.
2. If for no other reason than to introduce a new aspect and local interest to oldtimer model activity the new cut-off dates should be adopted.
3. Make no change to the Australian Old Timer model cut-off dates and risk the possibility of further stagnation presently being experienced in this aspect of RC aeromodelling activities.
4. The limitation of scaled Antique and Old Timer models to 120 inches wingspan is probably a good idea when considering models complying to FAI and in our case MAAA general rules. However the problem of non-complying models has not really arisen in Australia to date.

From SAM 600 Newsletter, The Thermaleer.

In the Contest Director's Report in # 130 of The Thermaleer, Brian Laughton reported the following:

"It was decided by a vote on the morning of the AGM that we would trial shorter engine runs and fuel allocations with shorter maxes to try to bring down the height of models competing as most of us are getting older and our eyesight and reflexes are not as good as they used to be. So i have listed below all of the new times that will be flown at Cohuna in early November this year as a trial to see how it goes."

"We agreed at the AGM that we would reduce both the engine run & the flight time by 30% except Burford as we felt that the maximum flight time was too short so we left that as is. Also it was felt too difficult to try to bring the 1/2A motor run down so we have left it as is also."

Then in The Thermaleer #131 the Contest Director's report included the following:

"In the last two comps of the year we trialled shorter motor runs/fuel allocation/maximum flight times and after the last competition the opinion of the flyers is that it is OK and does keep the models within the limits of our failing eyesight, so we will keep trialling it through 2015 except for the Roy Robinson Trophy and the State Champs which have to be run to the MAAA rules. If we are happy to keep continuing the shorter runs, which are also being trialled in both S.A and NSW, when the next rule change comes around if we are happy with it, the MAAA rules may be changed to accommodate the shorter runs."

Comment has already been received from Peter (Condo) Smith on this matter and it is set out below. SAM 1788 members should consider these possible rule changes so that when and if these changes come to pass you will be ready to express your point of view.

From Peter (Condo) Smith:
On 17/11/2014 10:48 AM, peter smith wrote:

Well, straight to the point.

Ever since I've been a SAM member there have been rule changes designed to increase membership and participation in the Champs.

NOT one single change has EVER resulted in increased participation!!!

So STOP changing the rules, as you're just driving the die-hard members AWAY.

Condo

SAM 1788's representative on the MAAA Oldtimer Rules Sub-Committee is Basil Healy.

Basil can be contacted on telephone 02 4341-7292 or by email basnpat@tac.com.au.

Belconnen Model Aero Club – Yass Old Timer Meeting From Grant Manwaring

This year's event was held over the weekend of 15 – 16 November 2014 at the Yass Model Aero Club site at Yerrawa. We were hoping the change to November would see the weekend enjoy better weather conditions, Friday was a Total Fire Ban day, then rain all night Saturday night and Sunday put an end to activities on Sunday.

We were able to fly Saturday and completed both Burford and Duration events. There were eight entries in Burford with four flyers making it to the flyoff. Peter (Condo) Smith took this out with his new small size Commando, Grant Manwaring in second place with Basil Healy in third, both flyers flying Dixielander's. First and second place were using the new T2 Burford engine.

Duration event after lunch with eight flyers. No flyoff in this one as conditions were not ideal. Not one maximum score recorded in this event, only two flights recording better than six minutes. First place Peter Scott, Saito 62 Playboy, second place Peter (Condo) Smith Profi 40, Grant Manwaring third, Saito 62 Lanzo Bomber.

Results Yass Old Timer Meeting 15-16 November, 2014.

Gordon Burford Event					
Peter J.	SMITH	Commando	Plain (T)	900	772
Grant	MANWARING	Dixielander	Plain (T)	900	626
Basil	HEALY	Dixielander	Plain	900	265
Peter	SCOTT	Zoot Suit	Plain	900	228
Wayne	HARRIS	Eliminator	Plain	832	
Peter	Van Waterbeemd	Stomper	BB	764	
Bob	MARSHALL	Lil Diamond	Plain	504	
Geoff	POTTER	Spacer	Plain	114	
Duration					
Peter	SCOTT	Playboy	Saito 62 4/		954
Peter J.	SMITH	Playboy 106%	Profi 40 2/		934
Grant	MANWARING	85% Bomber	Saito 62 4/		930
Peter	Van de Waterbeemd	Bomber	McCoy 60		739
John	MANWARING	Playboy	Saito 40 4/		538
Bob	MARSHALL	Bomber 75%	Enya 53 4/		245

Good to see newcomers along. Wayne Harris flew an Eliminator in Burford recording three maximum scores but landed out, so not in the flyoff. Also John Manwaring (must be a good bloke) from Cootamundra flying a Playboy in Duration. Welcome to them both. Don and Beryl Southwell also called in to have a look.

Saturday night we had dinner at the Yass Motel, and it rained all night and most of Sunday. Trophies presented for Burford and Duration on Sunday morning in our motel room.

Thanks to Max Rixon, Wayne Harris and Mike Master for helping with the weekend, also the ACTAA Inc for their support of the event.

This event next year will be held at the NAAS flying field the ACT. This field is south of Tharwa but is an excellent venue with well set up facilities on site. More details to come.

Above Left: *Bob Marshall assists Geoff Potter with his Spacer in Burford.*

Above: *Burford flight line pits with Basil Healy and Geoff Potter.*

Above Right: *Peter Scott has just launched the winning model in Burford - Peter (Condo) Smith's scaled down Commando.*

Right: *Two cousins - John Manwaring from Cootamundra assisting Grant Manwaring with Grant's 2nd Place Dixielander.*

Above Left: *Geoff Potter starting his Spacer in the Burford Event assisted by Bob Marshall.*

Above: *Peter (Condo) Smith concentrating in the Burford Event and assisted by his wife May.*

Left: *Basil Healy and Gail Scott catches up with Don and Beryl Southwell. The windsock tells the wind which tended to make flying a little difficult. In the Duration event nobody achieved a max flight in the rounds which resulted in a rare instance of no flyoff being required.*

SAMS vs Free Flight Society - 14 November, 2014 - NSWFF Field Richmond.

Report from Peter Scott.

The Annual challenge and Free Flight Christmas party, Richmond NSW, was most enjoyable. A pleasant turn-out of fliers.

SAMs had two gun fliers, Peter Scott and Basil Healy, and a novice, Bob Marshal.

I flew the Eureka with a Webra Mach 1. I got an over run and three flights that either dt'd early or simply didn't max. The model shows great promise with a really fast climb, but as most free flighters know – the faster it flies the more critical the trim!

Basil did well with his Elfin powered Creep but only managed one max. Bob's model was destroyed on the first trim flight due to a poor launch and so he ended up flying my BB Elfin 1.49 powered Stomper – and did better than either Basil or me.

Roy Summersby, flying a Swiss Miss powered by an Oliver Tiger and Jim Christie, flying a rubber powered model, were the only two free flight contenders. Roy managed three maxes but our three scores combined beat their two.

I also flew in the free flight scramble at the start of the day. I only had half a contest as my tomboy gradually fell apart – when the engine fell out, complete with front end, I knew the jig was up! I still ended up in fourth place.

Weather for the day was perfect, very little wind, good barbeque etc. Good turn up of fliers for competition and fun-fly.

Basil and Bob will be joining us for New Year's festivities and flying at the West Wyalong. Geoff Potter and Helen are also coming along. If any of you feel like joining the fun, I'm sure you will have a great time. Feel free to fly any sort of model.

All the very best for 2015.

Peter Scott.

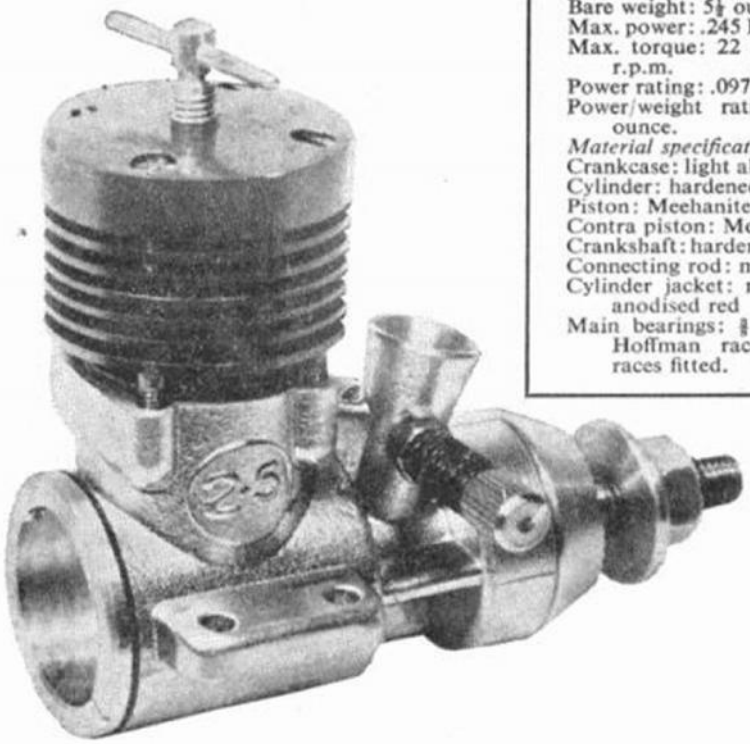
AERO MODELLER 230

Displacement: 2.506 c.c. (.1529 cu. in.)
Bore: .576 in.
Stroke: .5865 in.
Bore/stroke ratio:
Bare weight: 5½ ounces.
Max. power: .245 B.H.P. at 14,000 r.p.m.
Max. torque: 22 ounce-inches at 9,000 r.p.m.
Power rating: .0975 B.H.P. per c.c.
Power/weight ratio: .045 B.H.P. per ounce.
Material specification:
Crankcase: light alloy gravity die casting
Cylinder: hardened steel
Piston: Meehanite
Contra piston: Meehanite
Crankshaft: hardened nickel-chrome steel
Connecting rod: machined from dural
Cylinder jacket: machined from dural, anodised red
Main bearings: ⅜ in. twin/ball races—Hoffman races specified, Fischer races fitted.

Specification and Propeller—R.P.M. Figures

Propeller		*r.p.m.*
Frog nylon	9 x 6	10,300
	8 x 4	12,600
	7 x 4	15,200
KeilKraft nylon	9 x 4	11,400
	8 x 6	10,900
	7 x 6	12,600
	8 x 4	12,800
	7 x 4	15,500
Top Flite nylon	9 x 4	10,800
	8 x 6	10,900
	8 x 4	13,400
	7 x 6	13,400

Fuel: equal parts ether, castor and paraffin, 3 per cent. amyl nitrate.



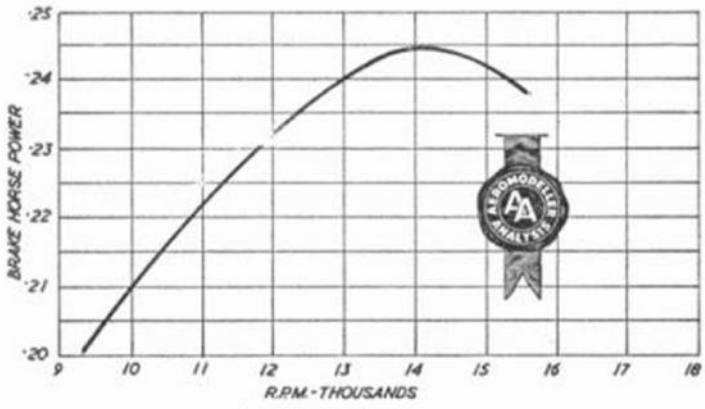
Engine Analysis No. 95

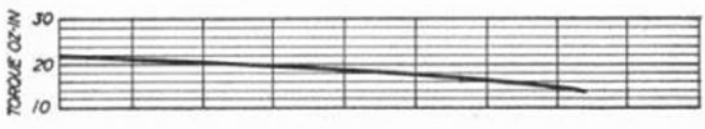
TAIPAN 2·5 BR

reviewed by R. H. Warring

ENGLISH ANCESTRY IS obvious in this Australian 2.5 c.c. diesel, the layout, proportions and details being very similar to the Frog 2.49 BB, with ETA and E.D. mixed in. We found it to be a sound, well made engine, and a good performance in the sports motor class. Starting and handling characteristics were straightforward with controls non-critical, although the higher the load-speed the greater care needed to establish optimum settings for smoothest running.

As received, the "Taipan" had little running. The piston was, however, quite a slack fit so very little running-in was required. The relatively poor compression did not make starting difficult—and probably improved the high speed running anyway. When hot there was an almost complete absence of compression, but starting was still relatively straightforward. The only awkward characteristic about handling. was that the contra piston was on the tight side and the compression adjusting screw too loose. As a result, the compression screw would work free leaving the contra piston in a set position with the chance of it suddenly snapping back.





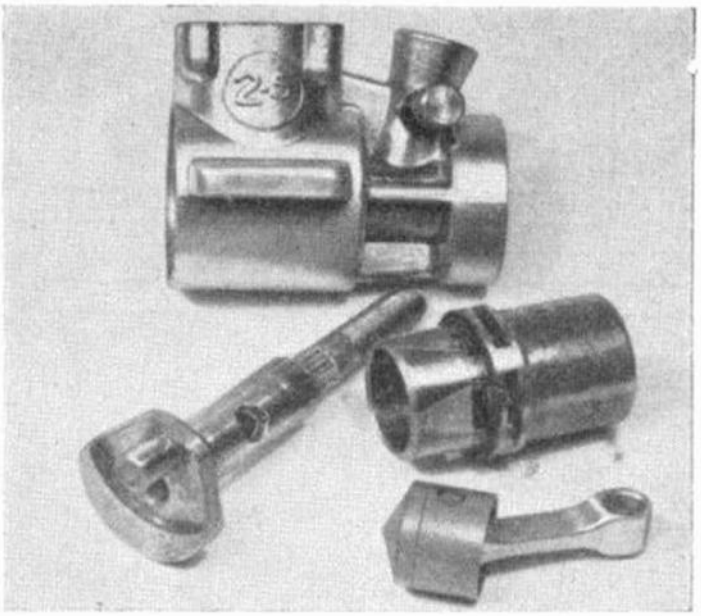
To slacken off compression when the engine was hot, it was usually necessary to increase compression first to move the contra piston and build up extra pressure to move it back when the screw was unscrewed. A locking tommy bar is provided as standard with this engine, which will overcome the looseness of the screw thread and would appear a necessary fitment. Contra piston fit is largely individual and could well be easier with other examples. If on the slack side, however, the tommy bar lock would appear essential to hold a compression setting.

Crankcase unit is a gravity die casting in light alloy, subsequently machined for the bore, crankcase interior and the ball race housings. Plain bearing length between the races is also finished as a "running fit" for the shaft to act as an oil seal. There is, nevertheless, a considerable oil leakage from the front end so that the engine tends to be a "dirty" runner. Ball races carrying the crankshaft are ⅜ in. diameter front and rear, made by Fischer (British). These are press fitted into their respective housings.

Machined from bar stock steel the cylinder had an exhaust flange milled through to give four circumferential ports. The lower section is ground down and then ground at an angle to produce four "flats" of wedge shape forming expanding passages opening into the four transfer ports cut through the walls immediately below the exhaust flange. These transfer ports come immediately below the exhaust ports and are of the same size. There is thus no possibility of overlap, the transfer opening being the thickness of the bottom flange below the exhaust (approximately 40 thou.). There is, however, a substantial "pillar" section supporting the upper part of the liner and the whole liner is extremely rugged. Upper liner overall diameter is .75 in. for a bore size of .576 in. (*i.e.*, .087 in. wall thickness). The liner is hardened, ground internally and honed to finish with a considerable taper relief at the bottom. It seats very loosely in the crankcase unit, so loosely in fact that there is no definite location for position other than that given by the four hold-down screws. A gasket is used under the liner flange to maintain a gas seal.

The Meehanite piston is conical topped, and machined with a small circumferential groove just above the gudgeon pin. Such a groove used with a loose fitting piston can prove effective as a compression seal, by retaining oil; and a piston on the loose side is usually better than a tight one for maximum performance anyway—provided piston and cylinder are truly circular.

Neat crankcase casting, flats on ower cylinder for transfer ports, small induction port and oil groove in piston are salient features of this tough Australian diesel.



Gudgeon pin is $\frac{5}{32}$ in. diameter, fully floating. The connecting rod is machined from solid dural and emery papers and polished to finish. After approximately one hour's running time, there was appreciable wear on the little end bearing and "rattle" on the big end—the latter not helped by the fact that the crankpin was not truly circular. Obviously the grinding wheel was vibrating when the pin was ground, giving a 10 thou. ovality to the finished diameter of the pin.

The crankshaft is of hardened steel, $\frac{3}{8}$ in. diameter stepping down to $\frac{1}{4}$ in. diameter in front of the journal. Shaft hole is 13/64 in. diameter, with a circular port of the same diameter. The stepped down section of the shaft is splined to take a Frog 2.49 type dural driver. Crankshaft is finished by grinding all over the journal length and the crankpin. The crank web is cut away for counterbalance. Shaft fit is very "easy" in the race inner rings.

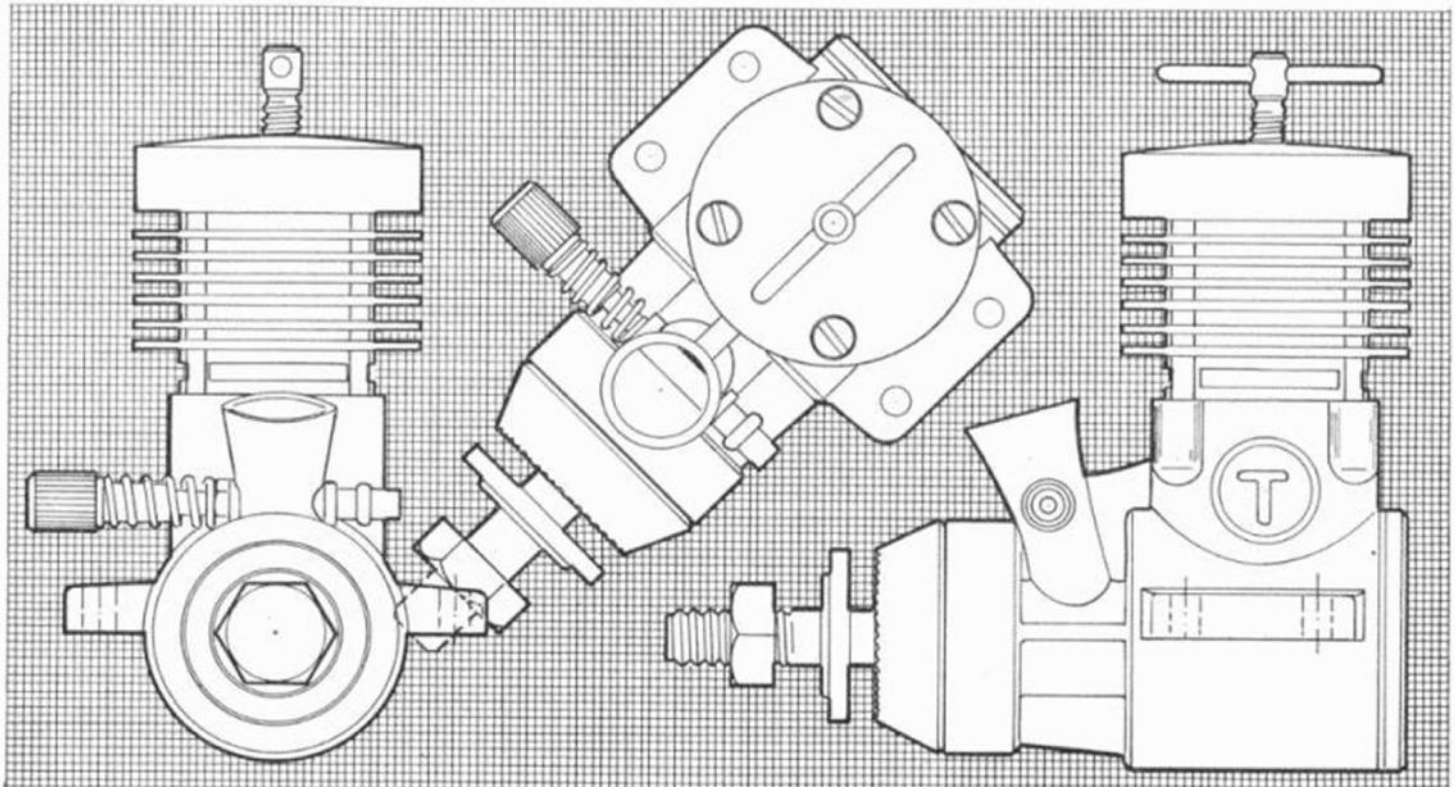
The cylinder jacket is machined from dural, anodised red. It secures with four long screws passing down into the crankcase unit lugs. Crankcase back cover is of the conventional screw-in pattern, also machined from dural and fitted with a fibre gasket for gas seal. The spraybar is of brass, with a steel needle valve fitted with a brass thimble locking by means of a coil spring. The needle valve control is a little near the propeller disc for comfort, but of a sensible size for gripping. Its coil spring provides adequate locking action without making the thimble difficult to manipulate for fine adjustment.

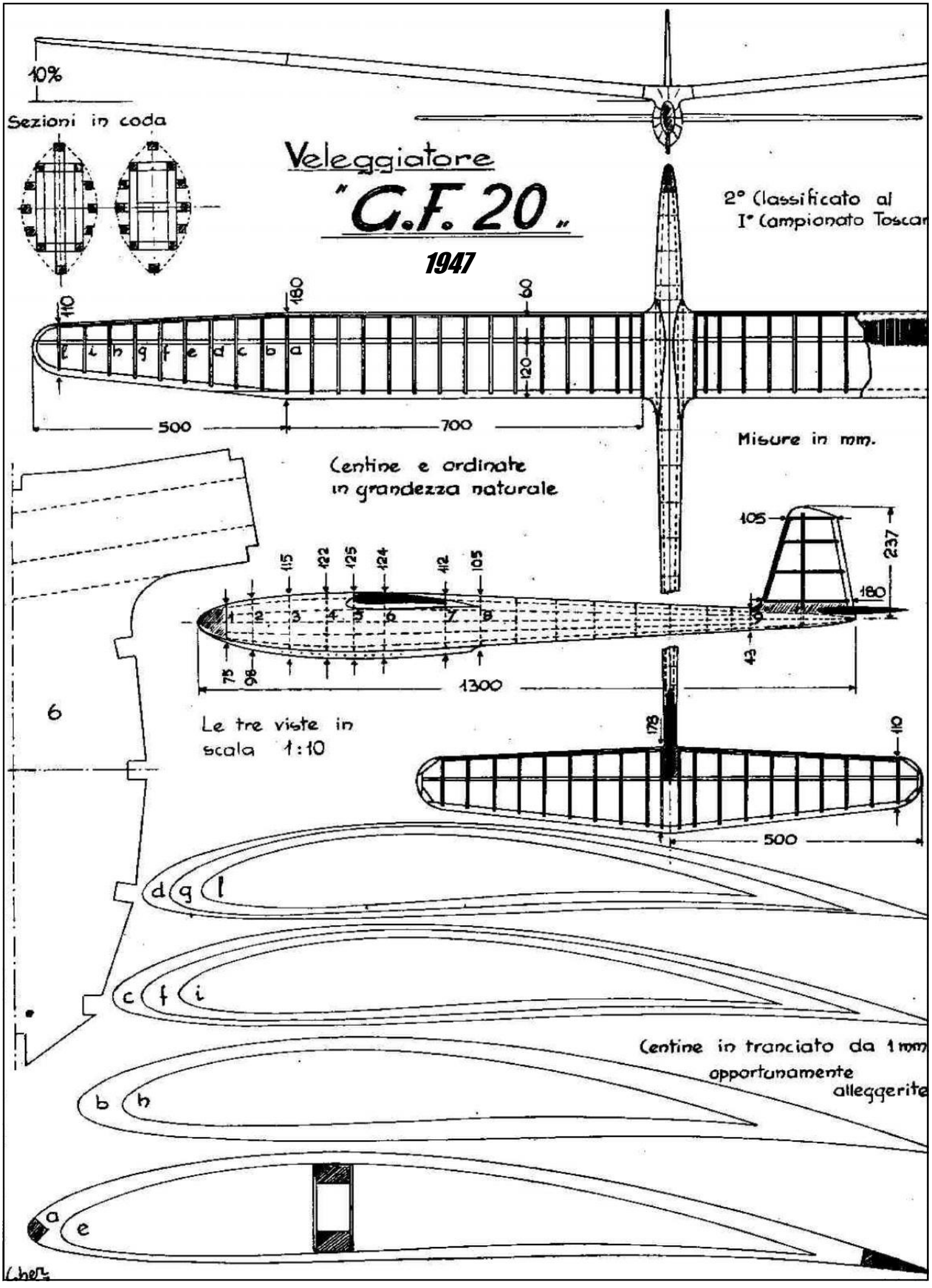
General impressions on handling the "Taipan" were favourable. It is easy starting, runs strongly and develops good torque for driving large diameter or high pitch propellers. Peak power is developed at 14,000 r.p.m., which would indicate an 8 x 4 or trimmed 9 x 4 propeller as about the optimum size for free flight and a 7 x 6 or 8 x 6 for control line, although the manufacturers recommend larger sizes, *e.g.:*

Stunt—8 x 8
Team Race—7 x 9
Free Flight— 9 x 4 or 10 x 4

The faults mentioned on the test engine are probably specific to this particular engine and not general. A tighter fitting compression screw or inset friction lock, together with a slightly freer contra piston fit, would have made it an engine which we would have called pleasant to handle. The wear on the little end was probably brought about by the ovality of the crankpin giving an eccentric bearing loading—and again a production fault rather than a design fault.

The "Taipan" 2.5 BR will run well on most standard diesel fuels, although inclined to "miss" at high speeds on non-nitrated mixtures. A minimum of 3 per cent. amyl nitrite (or equivalent) is recommended. Fuel consumption is moderate, a characteristic being, that as engine speed is increased (*i.e.*, the load decreased) the needle valve has to be opened up. Maximum fuel economy will, therefore, be realised with the larger propeller sizes and running the engine below peak r.p.m.




10%
Sezioni in coda
Veleggiatore
"G.F. 20"
1947
2° Classificato al
I° Campionato Toscan
110
180
60
120
500
700
Misure in mm.
Centine e ordinate
in grandezza naturale
105
237
180
115
122
125
124
112
105
75
98
43
1300
6
Le tre viste in
scala 1:10
178
110
500
d g l
c f i
Centine in tranciato da 1 mm
opportunamente
alleggerite
b h
a e

THERMAL SOARING AS APPLIED TO OLD TIMERS

An article by Don Bekins from SAM Speaks #27, Sept – Oct, 1977.
Gleaned by Don Bekins from Mark Smith (former National Soaring Champion)

The only difference between an old timer and a glider is the method of getting the model in the air. Deriving the benefit of thermal activity is a matter of recognizing the updraft when your model passes through it, and then getting in it and staying there. Once that is done, then you must get the plane down on time and hit the proper spot if you are flying the limited engine run events.

Here is a summary of Mark Smith's comments, with some of mine added. When you arrive at a field, look for the "hot" spots; a building, dark roads or fields or other landmarks that can produce enough radiant heat to start thermal activity. Don't forget that line of contestants' cars from which those shimmering heat waves rise at mid-day! This is a part of getting to "know the field". It is most helpful to have an "assistant" who can help in spotting thermals and educating the timer in reading the watch and calling countdowns.

Before take-off, the assistant should hold the plane and confirm with the pilot that he has the transmitter and receiver ON, with all controls operating properly. When the model is off and climbing, the timer should call the time every five seconds of engine run to fifteen seconds, then call each second as it is tacked off. At eighteen seconds, the pilot should give some down elevator and cut the throttle. The reaction time for the movement of the stick and the mechanical cut-off will give a perfect twenty second run.

Now the model is gliding and properly trimmed for straight and level flight. In Mark's words, "Don't stand there and watch it fly - stare at it, concentrate, bear down and look hard". "Watch for the faintest wiggle, bump or deflection from its flight path". "Don't let anyone distract you by talking; thermal soaring is work! Keep upwind, set up a search pattern and stay alert". Hunt, trading altitude for distance. If the airplane is in 'down' air, get the nose down and get out of there. Usually strong down currents are an indication that a thermal is in the vicinity. Other indications are circling birds, a sudden change in temperature or a sudden wind shift. Be alert.

As you practice R/C soaring you will find yourself being able to sense the location of a thermal. If the airplane will cover enough ground, the chances are good that you will find rising air. When in the immediate vicinity of a thermal, the flight path will be deflected depending on the location and strength of the thermal. If the airplane passes along the edge, it will raise one wing. Turn into the wing that raises, for the model is just outside the thermal. If the tail rises, the airplane is flying through the thermal so press on until the plane regains a normal flight altitude. Then turn and plunge into the centre of the thermal. Start a large easy circle. If the plane ascends on one portion of the circle and descends on the other, move the pattern over toward the ascending portion. Keep working until the model is going up at a high rate. Security is a thermal!

Mark Smith's advice continues, but I would like to add a short note. How do you tell when the airplane is going up? When the model is nearly overhead, this is nearly impossible to perceive. Therefore, I make it a practice to move the model upwind to approximately a 45 angle. At that position it is easy to detect the altitude changes immediately. Once you are circling in a thermal, you can set down your transmitter and let your airplane do what it does best - soar. If it passes overhead or through the sun, don't worry. Your model is stable and will continue flying as a freeflight in the trim that you have set. Only when the model stops going up, or is too high, or too far away for visual contact, do you disturb the trim and bring the plane back. Thermals move with the wind direction - downwind. Mark continues: "As the plane moves out of visual range, get the nose down and head back. Return to the area where you found the last thermal and set up another search pattern ..."

Finally, the plane has been up as long as required. It is time to establish your landing strategy. At the John Pond Commemorative, the requirement is to hit a fifty foot circle at exactly five minutes of duration. Time over or under is deducted from your time in the air. If you are way up, then you had better start down with one and one/half minutes to go. (*we no longer have this rule, Ed.*) In any event, start your descent at the latest one minute before touch down. Have the timer call off the elapsed time every minute during the flight so you are fully time-oriented. At one and one/half minutes to go, have the time called every fifteen seconds. Stay upwind during the descent.

At one minute to go, you should be about one hundred feet off the ground. Turn down wind and pass to one side of the spot in a shallow dive. At thirty seconds you should be on your final approach aimed at the fifty foot circle. Keep up your speed. Your distance downwind is determined by your airspeed and the velocity of the wind. The timer should now be calling the time every five seconds. At fifteen seconds he should count down every second, and your plane should be ten to fifteen feet off the ground. If your plane has sufficient speed you can make it touch the ground just as the timer calls one second to go. By the time he reacts and pushes the button, you should have five minutes to the second and a spot landing. Remember, it is better to pick up the extra points by hitting the spot than to miss it and touch down at the exact moment.

Now a word or two about flight attempts; If you have a foreshortened engine run or poor engine performance, it is far better to take an attempt by letting the engine run over twenty seconds, or in the case of a short run, getting the plane down under forty seconds. Remember, you have six attempts for three official flights. (*we no longer have attempts, every flight counts, Ed.*) Don't tempt fate by trying for that elusive thermal if you don't have maximum altitude!

So there is a proven formula for contest wins. In the words of Mark Smith, "Prepare the airplane and yourself. Mental attitude has a lot to do with *RIC* thermal soaring. A positive thinker expects to find a thermal and when one is found he is ready to work it. A negative thinker does not expect to find a thermal, so he does not really look for one ...." Think positive! With all that down air there has to be a thermal there somewhere." Remember, practice will help win contests.

Don Bekins.

From Jim Hainen - JIMSAM40@aol.com

It was at the Nationals around 73 or 74. I was flying a Starduster 900, one of the Starduster series which was Sal's most famous model and certainly the best as far as the commercial end of the model business was concerned.

As I was launching the Starduster 900 with a K&B Series 64 rear rotor, Sal came rushing over and scolded me because I had it covered with MonoKote. He proceeded to tell me that the model would never fly right with this plastic covering because the wing would flex too much.

Needless to say he was wrong for once, as plastic covering became a way of life for modellers for years to come.

In 1998 I was CD of the Sam Champs at Muncie for RC. I, along with Don Bekins, decided that the theme plane would be Sal's Pacer.

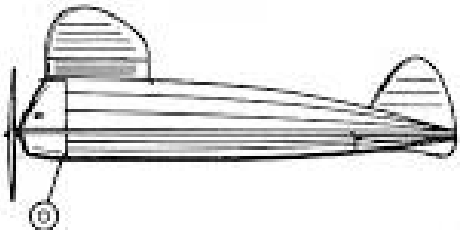
I have a picture of the group holding their Pacers on a shelf in our family room. He was my favourite modeller of all time. My very first power model back in the forties was a Pacer with an OK 60.

So I built a Pacer for the special event with an OK 60 that I purchased just for the event from Woody Bartelt. I flew the model one time and that was at the Champs. I placed that model in my shop hanging from the ceiling in 1998. It is still hanging there to remind me of a thirteen year old boy and his model a long time ago.

Sal and memories like this are what life is all about.

Cheers,

Jim Hainen



WHO GAVE THEM THE IDEA?

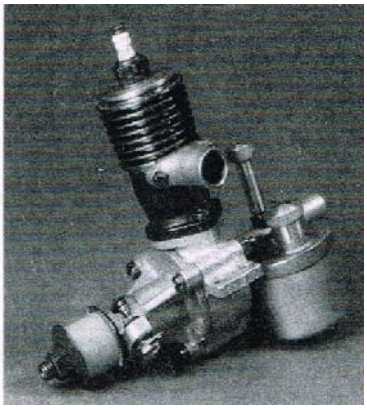
By Don Howie.

In the early part of the Twentieth Century the "Model Engineer" magazine, first introduced by Percival Marshall in January 1898, featured many model internal combustion engines.

People like Gerald Smith produced a working 5 cylinder radial, this featured in a February, 1924 issue. The first working Model Aero engine by Edgar T. Westbury was a single cylinder two-stroke sideport of 52cc capacity, this featured in 16th September, 1926 issue of this British magazine. The engine was to power a design by F/Lt. Nick Comper before he built a full size version (Comper Swift).

In 1932, Comper built a 14.2cc version for Captain C.E. BOWDEN and the engine was name the Atom Minor. Also in 1932, an engine by J. Andrews of 15cc was featured, this using rear rotary valve induction. This engine was to influence Westburg and many of his engines were to feature rear rotary valve induction.

Two readers of "Model Engineer" in the nineteen thirties were Mel Anderson and Bill Atwood who lived in the same street in Glendale, Los Angeles, California. Mel and Bill came up with the idea of front rotary induction, to make a two-stroke engine simpler and cheaper to build. Bill Atwood asked Major Moseley at Aircraft Industries, Glendale Airport, to make his engine and the Bab Cyclone .36 cubic inch F.R.V. was produced from December, 1935. The name came from Major Moseley as his company overhauled Wright Cyclone aircraft engines.



WILLARD .19 *Designed and produced in small numbers in 1939 by Willard Hungerford, Los Angeles, California. First rear disc valve model engine.*

Next development in model engines was rear disc induction and we must thank Willard Hungerford from Los Angeles, California, for the Willard 19 in 1939. Made in small numbers it was used by Carl Goldberg in his prototype Comet "Mercury" in 1939, the engine having more power than the popular Ohlsson 23 sideport. People tend to thank Sheraw with his Bantam 19 and the Forster Brothers with their 29 in 1940.

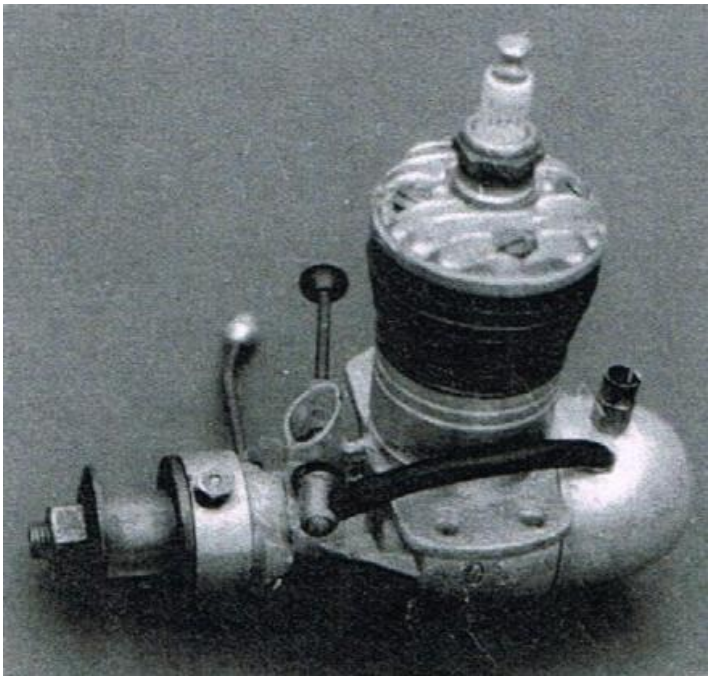
M&M "PISTON VALVE ENGINE" 1939 - .292in³ .

Permold case with initials. Flutter valve (reed valves) induction. Fuel bypass through centre of piston via sub piston. Full depth fins below exhaust.
Thanks to Tim Dannel's "American Model Engine Encyclopedia" (A fantastic book)

Next, one of the biggest CONS regarding 360 degree porting. In 1939, the M&M Wheel Co. (Merry and Merz) Seattle, Washington State, came up with the M&M Piston Valve motor at .292 c.inch size (5cc). It also featured reed valve induction and by 1940, the large company of Megows were now the agents to sell this engine.

The other big company in the USA was Polks of New York (Nathan & Irwin) and they had funded Ray Arden to produce the Atom .099 piston valve engine in 1939. They placed a Patent on the design, even though piston valves were used in rotary engines of the first World War. They took M&M to court and the company ceased production of the engine.

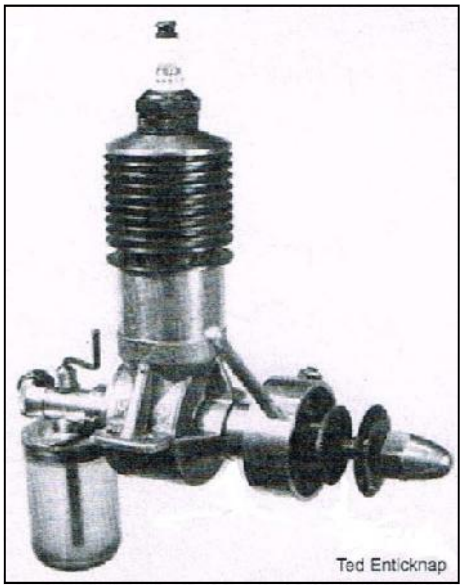
They came back in 1940 with the M&M "High Speed" 29 which had modern 360 degree porting with a conventional piston. The O.S. company must have read about M&M as Shigeo Ogawa designed a 360 degree ported engine in 1943, making parts for a large number of engines at this time.



O.S. TYPE 9 - 360° PORTING - Made in 1943.
Engine sold to Servicemen in Japan, USA, Australia etc. in 1946.

Mid 1943, Ogawa Shigeo (O.S.) was conscripted into the Japanese Army and served in Burma during the war, not returning to Osaka until September, 1946. He found the family home destroyed but his factory remained undamaged. To survive at this time he quickly assembled the parts for his O.S. Type 9 and sold the engines to servicemen at quite low cost.

This is the most popular early O.S. engine world wide and many have been found in the USA, Australia and Britain. He certainly did not copy Ray Arden, who produced his Arden engines after the was and who many regard as the first with 360 degree porting.



M&M "HIGH SPEED" ENGINE. 1940 - .292in³

Similar to above, but aluminium sleeve below exhaust contains bypass. 360° porting. Conventional piston.
Thanks to Tim Dannel's "American Model Engine Encyclopedia" (A fantastic book)

Canberra Electric Oldtimer Day.

From Mike Colston mncolston@hotmail.com

An EOT day was held at the NAAS field in Canberra on the weekend of 1st and 2nd November. Unfortunately I could not attend as I was overseas. However, Phil Stevenson has kindly provided the following report:-

"The scheduled flying on the Saturday was blown out. Some of us sat around all day in hope, some went to town and came back in the afternoon, but no luck. We decided to try to fly the events as best we could early Sunday and during the lunch break of the F5J Glider event. Not ideal but better than nothing. A few people who said they were coming were no shows, because of the forecast, but we had enough people interested as most were also going to fly the glider event.

So 7.30 am Sunday we started with a few 1/2A rounds and Nostalgia flown in groups, managing to get a result from two rounds each before the 9.30 glider flying started. This left HL, Duration and Texaco to be flown when ready. Some flew during the glider event, some at lunchtime and some later in the day, so air was variable, but very good for most of the day.

By the end of the day Dur and HL were decided, but with a bunch of maxes in Texaco we decided a flyoff was worth waiting for. Late in the day with more wind than there had been since Saturday the brave souls launched and decided the Texaco event. We forgot to start the watch but I think 20minutes might have been achieved.

The NAAS field is excellent, plenty of room on the side for a few EOT flights while the F5J continued on the main runway. This will make for a great Easter NEFR venue."

The results for the events were as follows:-

EOT Texaco	EOT Duration	EOT Height Limited	EOT 1/2A Texaco	EOT Nostalgia
1st - Mel Gillott.	1st - Gary Andrews.	1st - Phil Stevenson	1st - Bob Wilson.	1st - Ray Murray.
2nd - Phil Stevenson.	2nd - Phil Stevenson.	2nd - Gary Andrews.	2nd - Phil Stevenson.	2nd - Phil Stevenson.
3rd - Bob Wilson.	3rd - Bob Wilson.	3rd - Peter Henderson.	3rd - Peter Henderson.	3rd - Jim Holt.

The number of contestants varied from seven to three in each event, not a bad turnout given the weather.

A daunting challenge - starting one's first diesel!

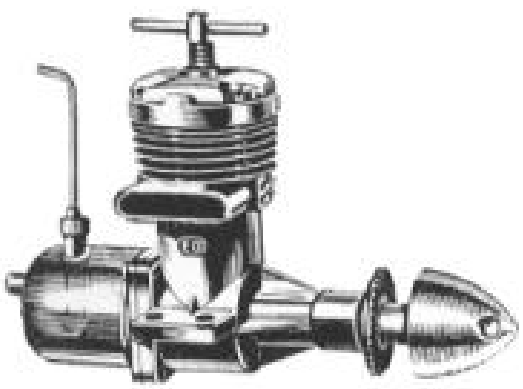
Adrian Duncan, September 2009

I started building and flying model aircraft in Britain in 1956 when I was nine years old, cutting my teeth on simple gliders and rubber-powered models. But the lure of the then-popular control line format was ever-present, and it was my ambition to become involved in that facet of the hobby as soon as circumstances permitted. The main barrier was financial – I simply couldn't afford an engine at this stage of my life.

At the time in question, the diesel was predominant in Britain for all but a few specialized applications such as control line stunt, speed and Class B team racing. So it was more or less inevitable that my first model engine would be a diesel, probably made by a British manufacturer. Accordingly, I read all I could about the care and feeding of model diesels so that when the time came I would be ready.

In 1959 I was among the oldest of my contemporaries to take the infamous 11-plus examination through which the course of one's future education (and indeed, one's future overall to some extent) was then decided. If I had been one month older I would have taken that exam a year previously! Anyway, I passed the exam and immediately turned 12 years old. My parents were so pleased (or perhaps relieved!) at my 11-plus result (which got me into grammar school) that they decided to really splurge for my 12th birthday and get me something that they knew I was lusting after – a new model diesel engine! The fact that my new school had a thriving aeromodelling society added impetus to my desires, about which I had made no secret!.

One of the standard beginner's engines at the time was the 1 cc ED Bee diesel, then in its Series 2 form with loop scavenging and glow-motor style side stack exhaust. It was far from being the most powerful 1 cc diesel of its time, and was in fact a bit of a standing joke among serious modellers. This was quite undeserved, since the Bee was an easy-starting and very durable engine which could be relied upon to give long and faithful service as long as one set it up right and didn't expect contest levels of performance out of the box.



Anyway, my Dad went to the local hobby shop and bought a brand new ED Bee on the advice of the shop owner after Dad had told him that the recipient would be a complete beginner with an interest in control line. I received this wonderful gift on my birthday with an immeasurable degree of gratitude – I can still remember the feeling!

But having the engine was one thing – starting it was quite another! At the outset, I anticipated little trouble – as mentioned earlier, I had read everything that was available on the subject of starting model diesels and considered myself to be very well informed. Alas for over-confidence .....

I made a test mounting block for it and followed the instructions implicitly, even to the extent of using ED Economic fuel (which came in a glass bottle at the time!). Not a crack could I get from the dratted little engine! In retrospect, it's obvious that I didn't have the required knack of really "snapping" the prop over by using a combination of arm, wrist and finger. But that's a knack that comes with practice – I lacked any experience whatsoever at this time. Basically, I had yet to acquire the necessary "feel" for a model diesel engine.

What does a 12 year old boy do when he runs into a problem like this? That's right – he brings in an expert, in this case my Dad, who was a professional mechanical engineer and should therefore know all about engines! So the next evening, down came Dad into the cellar where I had the engine set up. "No problem" said he as he rolled up his sleeve.....

Three hours later, he was still flicking without response apart from the odd pop and a lot of flooding, and I was quite alarmed at the language that was coming out! I learned a lot of new words that evening!

Dad finally gave up and went off to bed with a scowl on his face, a sore right index finger and a headache. But he was not the man to allow anything mechanical to beat him! The next night he was back down again for another three-hour period, with no better result. By now, his bad temper was making itself felt to one and all, even my long-suffering Mum. There was tension in the air .....

A third similar night followed. By now, I was making myself scarce, feeling that I was somehow the cause of Dad's increasing frustration and anger. It was however no longer me pushing him – I'd have been very happy if he'd have given up! But the idea of this pesky little mechanical device beating the great mechanical engineer was a concept with which my rather obsessive Dad simply couldn't cope. So on he went .....

At the end of this third evening of torment, Mum had had enough! She told both Dad and myself very firmly that the dratted little monstrosity that had assumed such a dominant position in defining the mood of our family had to go and not return until it had ceased to be a source of aggravation and ill-feeling. At this point, Dad belatedly remembered that there was a fellow at work who was an active aeromodeller and might be able to help. He hated the idea of having to admit defeat himself, but the imperative by now had become simply to get the thing running, by whatever means presented itself. So he packed up the engine and its test block and took them off to work with him the next morning.

What a change that evening!! Dad came rushing in through the door, yelling for the benefit of everyone within hearing "I can do it! I can do it!!" Before anything else was done, Dad insisted upon all of us heading down to the cellar where the test stand was once again set up. He filled the tank, choked it, clobbered the prop and away it went! "See?!?" he exclaimed triumphantly, "I can do it every time!" He proved this by repeatedly stopping and re-starting the engine. "It's all in the flick!!' he proclaimed from the lofty standpoint of his new-found expertise, finally standing aside to let me have another go. Armed with his advice, I quickly had it going myself, and have never had any problem starting a diesel from that day to this.

It turned out that Dad had taken the engine and stand into the machine shop at his workplace, where his aeromodelling colleague was employed as a machinist. The thing was set up on the bench, the chap set it by "feel" and it started on the second flick, much to Dad's initial chagrin. A lengthy instruction period followed, aimed at arming Dad with the necessary rapid flick required to start any model diesel engine. This is one of those knacks which can take a little while to acquire but once learned is so easy that you wonder why you ever had any trouble! Dad soon had it down, with the results reported above .....

However, I think that the incident may have scarred Dad for life! Certainly, he never laid another finger on the prop of a model engine and showed very little subsequent interest in my own consuming passion for the hobby, which has lasted lifelong. Too bad – it would have been nice to do some modelling and flying with him .....

I reckon that the "flick" issue was one reason why the glow-plug motor eventually achieved the prominence that it enjoys today. With glow ignition, there's far less "art" involved in flicking it over to start, and indeed one can safely use an electric starter, something which should never be applied to a diesel in view of the possibility of a hydraulic lock and consequent damage to the engine. It can't be denied that starting a diesel is more of a "black art" than starting a glow, although my subsequent 50 years of diesel operation have demonstrated that, once acquired, the knack never leaves you and diesel operation is just as easy as glow operation. Indeed, in many ways it's simpler – no plug to mess about with and no batteries required! Plus the infinitely variable ignition timing provides a level of operational flexibility that no glow engine can match.

That ED Bee served me very well indeed. It went into a KK Champ trainer on which I leaned to fly control line, and subsequently powered a whole series of other models over the years. I subsequently tuned it up to the point where it easily outran the average AM 10 (then the standard by which other 1 cc diesels were judged). I still have it today, 50 years later, albeit on its second rebore and third conrod. It's still mounted in a replica Champ which I made many years after the first one, and I sometimes give it a flight just to remember how it was when I started out.....

One thing about the ED Bee (and indeed its close relative, the 1.46 cc ED Hornet) – the aluminium rotor is somewhat susceptible to premature wear unless the engine is properly set up. The major issue is the end float on the crankshaft. The prop drivers on most of these engines were set up so that they never contacted the front of the main bearing – all that limited rearward float was the disc itself into which the end of the crankpin was located for drive purposes. It's essential to reduce the end float to the point where the front of the main bearing stops the rearward movement of the prop driver and shaft, rather than the crankpin bearing on the rotor disc. I do this by carefully reaming out the 7 degree taper inside the steel prop driver to a progressively greater depth until most of the end float is eliminated, thus keeping the rotor itself free from any axial loadings. This approach has the added benefit of increasing the threaded length of the shaft for prop mounting purposes, always a weak point on the Bee. But you can also achieve the same end by inserting a washer of suitable thickness between the rear of the driver and the front of the main bearing.

If you do this, you'll find that the aluminium rotor will last far longer than it will otherwise. In particular, a Bee or Hornet that has not been modified in this manner should never be used with a pusher prop, since the rotor becomes the thrust bearing and wears out very rapidly.

With this modification, the Bee remains to this day a delightful little sports diesel – still one of my favourites. Give one a try, but remember my Dad and practice that flick first!!

The Demise of the Rocket .46 Engine

From Roy Bourke <roybourke@yahoo.com>

I imagine most of you have heard the story about why the Rocket engine went out of production. But in case there are some of you that don't know the story, below is an excerpt from an article I wrote in the February 2003 issue of Model Aviation Canada, when I was SAM Chairman for MAAC.

The Rocket .46 Engine

Remember the Rocket 46? A "pretty good " ignition engine from the 1940's that went out of production after 1947. In 1952, remaining stocks of new Rocket motors were sold off at a very good price (I can remember buying one at the time!) But I always assumed that the reason the Rocket went out of production was the same as for many engines of the day, competition from more powerful or popular engines, the introduction of the glow plug, etc. But apparently that was not the case. I just recently learned of the real reason for the demise of the Rocket engine.

It seems that when General Motors was getting ready to produce their new Rocket 88 Oldsmobile production car, their marketing people found out that there was a toy motor named Rocket. Because of General Motors marketing concerns, they sent one of their agents out and he bought the little Rocket motor company, Corporate Products, Inc. General Motors then terminated the production of the Rocket model airplane engine by having all of the dies and tooling crushed. That was the end of the Rocket model motor.

From Tandy Walker's Web Page.

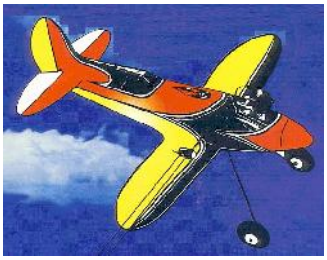
http://tandysmodelplanes.com/

"I bought my first engine, which was a 1945 Rocket .46 ignition engine and I have two Rocket's in my collection. - Tandy Walker"

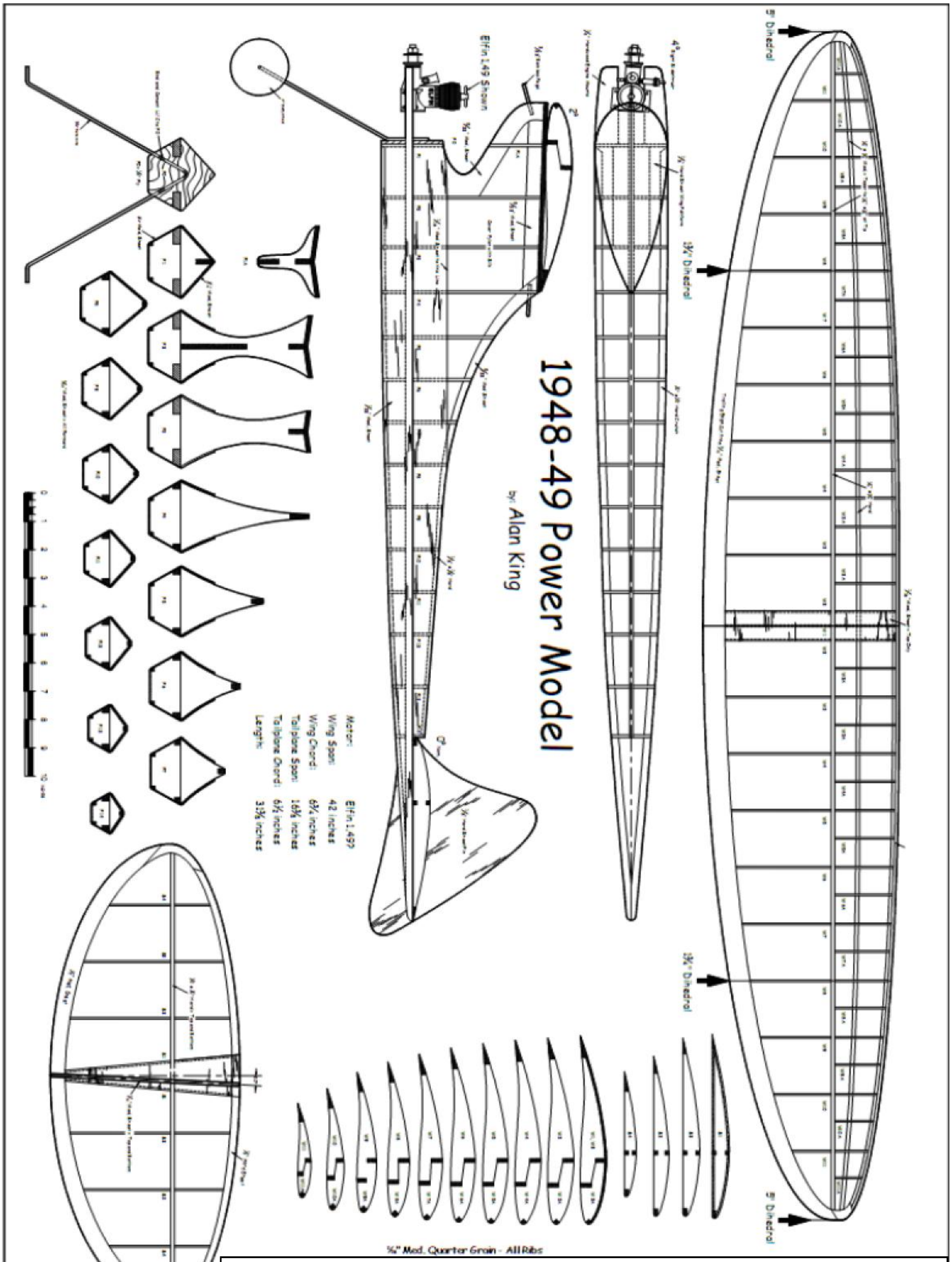
Later on, dad bought me my first gas motor while we were living in Capitol Hill in south Oklahoma City, Oklahoma. It was a Rocket 46 shown at left.

We bought a U-Control kit manufactured by Johnny Casburn in Fort Worth, Texas. It was called the "Baby Miss Behave", which is shown at right.

We put the Rocket 46 in the model, but of course it was way too large for the this model.



Drawing of Miss Behave



This plan of Alan King's 1948 Power Model has been redrawn in AutoCAD by Mike Glaister, Editor of the VFFS Newsletter. Contact Mike by email: michael.glaister@gmail.com if you are interested in building this model. Thanks Mike for taking the trouble to redraw this plan, it is much appreciated.

From Trevor Carey. tjc240z@gmail.com

In moments of boredom and what some might call "madness" one has flashes of "brilliance". This is usually coupled with trolling the internet looking for "stuff" or the next best weapon for what ever project one is embarking on.

I am currently stalled on a number of projects due to failing eyesight. Not a problem as the cataract is due to be removed this coming Friday. So what has this to do with everything?

Well being the "stirrer" that I am (past glories being the introduction of YS engines to duration plus numerous rule changes / modifcations over the years) I am now going to ask the following.

A Cox 1/2A engines. Specified in the rules:

a. Reed valve engines

b. Un-modified engines i.e. diesel conversions the operative word being conversion.

Now what we have is a 1/2A diesel Cox engine now available from the Cox engine makers. This thus is NOT a modified engine in as much as it is a factory produced engine. I believe it meets the legal requirement for 1/2A Texaco.

Your thoughts please and as I don't have Basil's email address could you forward it to him and any other parties that could / might be interested. I would welcome their comments / opinions.

Another topic that has been avoided to date is the 4 Stroke diesel. Is it entitled to be given a diesel allocation instead of glo and I guess how would it be classified. But that is one for another day.

Jim also awaits the outcome of this on

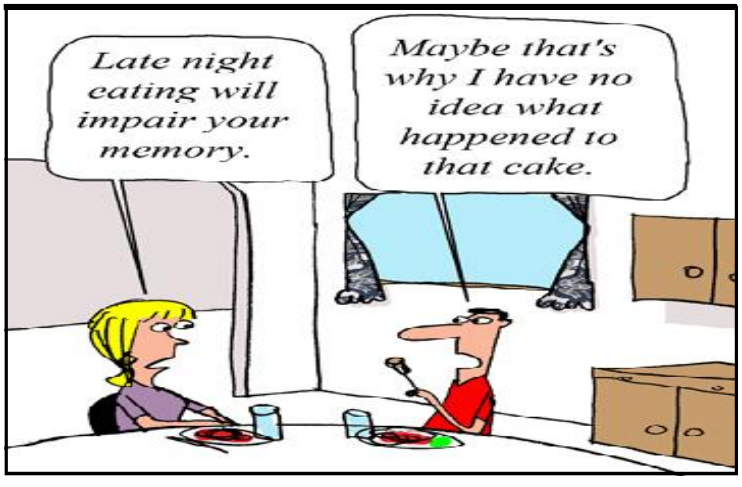
From your QLD mushroom (we know nothing about anything these days).

Trevor Carey. tjc240z@gmail.com

COX INTERNATIONAL CANADA.

Cox .049 Engine "Diesel Bee"

SKU: DIESBEE
Price: US$ 59.95
Cox 049 Custom Model Airplane Engine "Diesel Bee"
Features:
Performance Diesel head conversion
5cc Aluminium fuel tank
Includes instructions
Includes starter spring and cam
Includes 2 replacement Teflon discs
Heavy Duty Diesel crank
Custom engine assembled from original **Cox** and current production parts
It is recommended to break in this engine with a regular glow head and Nitro fuel
Application: Models requiring .049 engines
Performance: 11,000 - 13,000 RPM with 6x3 prop



Aussie ALLEN LAYCOCK presents his new Shulman WEDGY built for this years featured model at the 2008 SAM CHAMPS in Muncie. Powered by a S400 electric motor, Allen reports: The Wedgy is a delight to fly: hands off and ROGs are easy but it sure looks pugly!

From SAM 26 newsletter Bob Angel editor

LITHIUM BATTERY FIRE!

Mike Keville, former OT Columnist for Model Aviation sent this picture of the fire that can happen when you charge Lithium batteries and the charging procedure goes awry.

Sometimes thereís an explosion along with the fire. There ís not much of anything useable left which is why they recommend charging these batteries outside the aircraft. Let's hope the ship wasn't in the car trunk at the start.

THE BACK PAGE

COVERING YOUR MODEL.

Covering your model is one of the last things you do. It's also one that requires a lot of consideration if you want a result that's going to handle the loads imposed by the model as well as looking good. Which covering material you select will be based on numerous factors, including the following;

* Fuel proofing * Weight * Strength * Colour availability * Pricing

Note that even with the same covering there can be a reasonable deviation in the weight (per metre square) due to the mass of the pigments in the material, different colours have different weights.

Covering	Weight	Application method	Details
Japanese tissue	7gsm	Dope	One of the lightest coverings you can obtain. Note that this will require adhesive to apply to the airframe and doping or similar sealing.
Laminating film	???	Iron-on	Typically available in 1.5, 3, 5 and 10mil thicknesses, laminating film is an excellent low cost source of plastic type covering film. Even in the 1.5mil thickness laminating film exhibits exceptional strength to weight ratio.
Nelson Lite Film So-lite, Solite	21gsm	Iron-on	Considered to be one of the better iron on ultra-light films.
Litespan	30gsm	Iron-on	Litespan is a very light synthetic tissue used in place of normal tissue/dope. It is much stronger and tougher and doesn't need dope. Fuel proof as ironed-on.
Coloured Micafilm	40gsm (25gsm for transparent)	Framework is painted with heat-activated glue like Balsarite.	
Fibafilm	42gsm	Iron-on	Fibre-reinforced polyester film. Fibafilm is ideal for 'old timer' models, sailplanes, 'electrics' and any model that needs a light-weight covering that will stiffen the framework
Solarfilm	55~60gsm	Iron-on	Solarfilm is a plastic film covering (polypropylene), and is available in a wide range of solid, metallic, transparent and fluorescent colours and in a variety of sizes. It is easy to use with good shrinkage. Iron on and shrink tight with extra heat.
Solarspan	60~65gsm	Iron-on	Self-adhesive plastic film. Solarspan is a thicker, stronger version of Solarfilm. It gives a smoother finish and is easy to work round wingtips etc.
Monokote	65~75gsm	Iron-on	Considered to be a rather heavy covering for most park planes, Monokote is however rather tough and easy to use.
Econokote	gsm	Iron-on	Low temperature version of Monokote
Ultracote	70~90gsm	Iron-on	
Glosstex	115~125gsm	Iron-on	Glosstex has a high-gloss two pack paint finish, is fuel-proof.