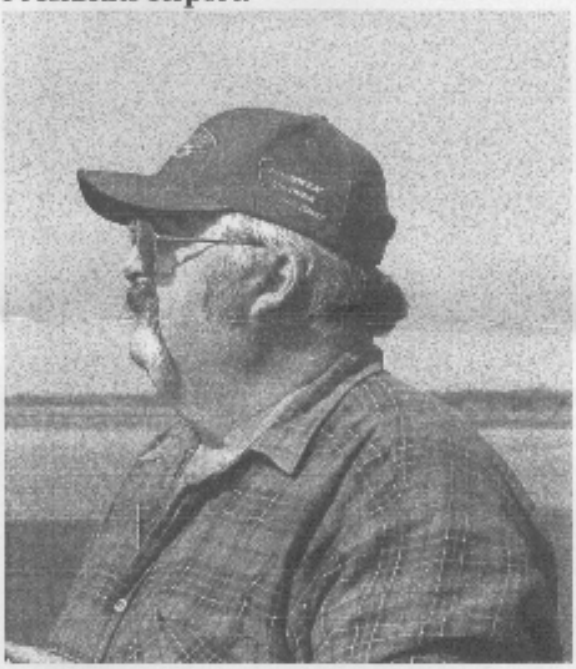
The Thermaleer

MARK COLLINS WITH ONE OF HIS WINNING MODELS FROM THE 58TH AUSTRALIAN NATIONAL CHAMPIONSHIPS.

Presidents Report.



Hi folks,
A little to report ,a group of us went to Sale for an old timerdemo and talk ,but bad weather put a dampner on the day.
Don Cameron and I also went to a club meeting at MARCS for another talk on old timers. Please don't forget the Eastern State Champs at Wangarratta on the 1 & 2 Oct. followed by the Frank Ehling 1/2 A Texaco Comp.to be flown any day from 1 to 20 Oct.
That's all for now regards Chris.
PS. See you at the next meeting.

BEG, BUY BORROW OR STEAL.

Wanted Plan of Keil Kraft Chief A2 Glider & copy of Aeromodeller plan of Smithy's Southern Cross. See Fred,

Wanted Plan and details of Grumman ASW Tracker. See Chris.

Editors Report.

Apart from the elections in July it's been a fairly quiet 2 months since the last edition of the newsletter but a couple of things are worth mentioning.

First is to remind you all that the next edition of the Thermaleer is the 100th. This is a big milestone in the clubs history and personally I think we should produce a special edition for the occasion.

Don Howie who has no commitments to Airborne at present has agreed to contribute a special article for the occasion. [Don's first work for us is in this edition on pages 4 & 5]

Trevor Boundy has agreed to write a few lines for us and I've also asked Peter Bennett and will ask Max Hayes as these three guys were all previous editors. Peter Hosking is in the West and will ask Paul Baatz to contribe some words. It could add up to several extra pages and cost more to print and mail out so let me know at the meeting if you think we should do it. I've spoken to some advertisers and they are interested in taking out a special advert and paying extra for it so that should cover the cost. Still it's your newsletter so you decide at the meeting. It will also be our 100th meeting so please ring anyone you know who is a member and get them to come.

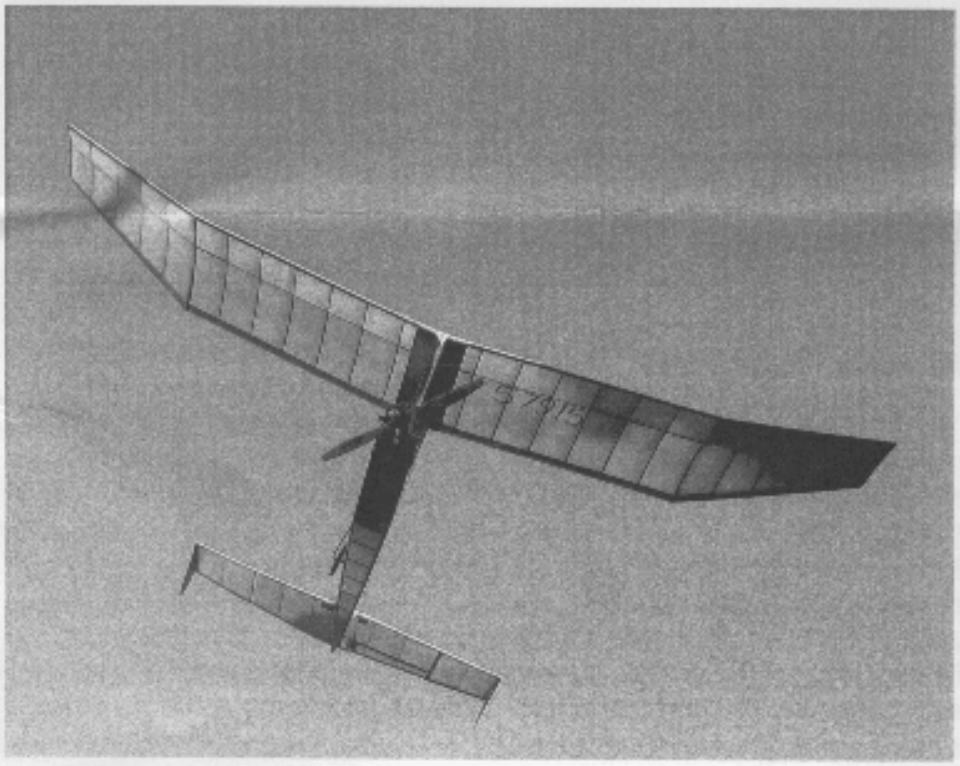
Another ex member has contacted me and said they have not renewed their membership because we are so heavily geared to out and out competition with no organized social flying. If we keep loosing members we'll end up a piece of aeromodelling history just like the planes we fly and I'm sure none of us want that.

The trips that some members have made to Gippsland and Marcs are a step in the right direction and can only do good. I received a flyer in the mail the other day about a model aircraft fly in which has been going on for several years and could be of value and interest to us. It read:

WANTED : Flyers to Participate at "Warracknabeal's Model Aircraft Club" 14th Annual ***"MALLE RALLY"*** 15-16TH October Starting at 9am. Aircraft don't have to be of a competition standard, just come and have a good time. Silvertone keyboard with 2" keys. Free camping at field with full toilet facilities and gold coin donation for hot showers. Food stand also in operation.

The field is 3km out of town on the Henty Hwy next door to the Agricultural Museum.

Warracknabeal also has 3 motels, 5 Hotels and 1 Caravan Park. The man to contact is Peter on 03-53982249. This could be a real chance to show case the old timer movement and what we are about.



The Editors Latest Toy.

The Jimp by C. Allen. The original won the Nothern Heights Gala in 1949 plus numerous other contests. The original was powered by an E.D. 2cc Competition Special. This one has it's engine on an alloy plate so that engine changes are a simple job. It will use a PAW 1.49cc for 2cc, a Taipan 2.5cc for Burford and an O.S. 15 Max 111 for Nostalia. Model is covered in SAM span and tips the scales at 16oz with any of the above motors.

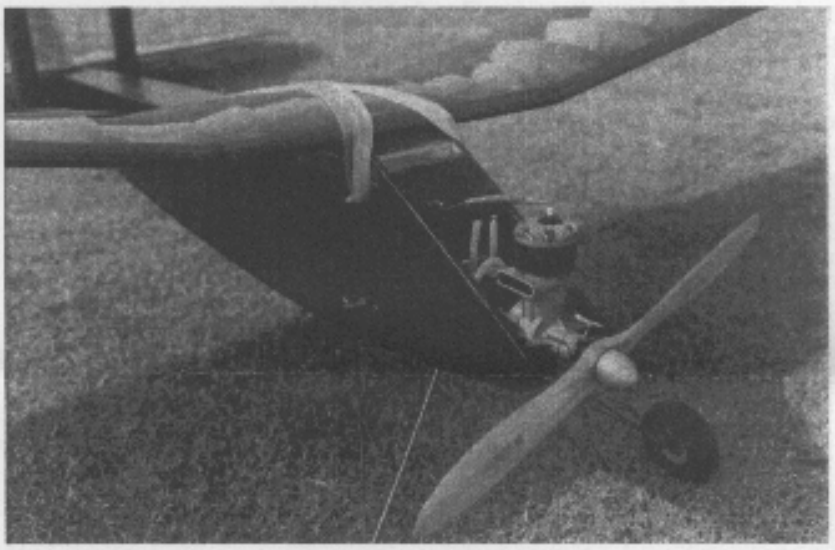
Old Timers Today. By Don Howie.

Looking back over about 20 years of flying Old Timers, it was the late Leo O'Reilly that got it going in our state of South Australia. Les had an interest in models flown in the late forties in South Australia and one of these was the "Super Hatchet" designed by Bill Evans.

Bill Evans, Jack Black and Gordon Burford got model flying going again after the war, with these three modellers producing model engines in the period of the late forties and early fifties.

Gordon started with his 5cc diesel in 1947 as nothing was then available here, whilst Jack Black produced his JB 60 spark engine, based on the American "Super Cyclone 60".

Bill Evans designed models and his "Super Hatchet" won the 2nd Nationals in 1948, in Camden, N.S.W. This large F/F design used an Arden 199 glo; the latest class A "hot" engine from the U.S.A. Normal young modellers were unable to get the American spark and glo engines from 1948, as imports only allowed British products. The top large engine used in C/L stunt flying was the Atwood Super Champion .624cu.in. spark engine that used 2 rotary valves to get maximum performance.



When in 1948 it was run as a glo, rather than spark and using nitro-methane with methanol fuel, it produced about 1 B.H.P. Most of the pre-war 10cc spark engines were rated at 1/5th or at best ¼ H.P. usually at about 6,500 revs.

By the early fifties Gordon Burford had a number of Sabre engines in production, such as the SABRE 250 diesel,that was as good as the ELFIN 2.49 diesel. He had the SABRE 49 glo, based on the Atwood Triumph 49 glo, and this SABRE engine became the top C/L stunt engine in Australia. The SABRE 19 glo from about 1953 was another great Australian engine for F/F, radio or C/L use.

Bill Evans had his "Aristocrat" kits with C/L stunters, team racers etc. and in late 1952 introduced his DELTA 490 glo for team speed use.

Monty Tyrell came over from Victoria to work with Bill in his shop and factory.

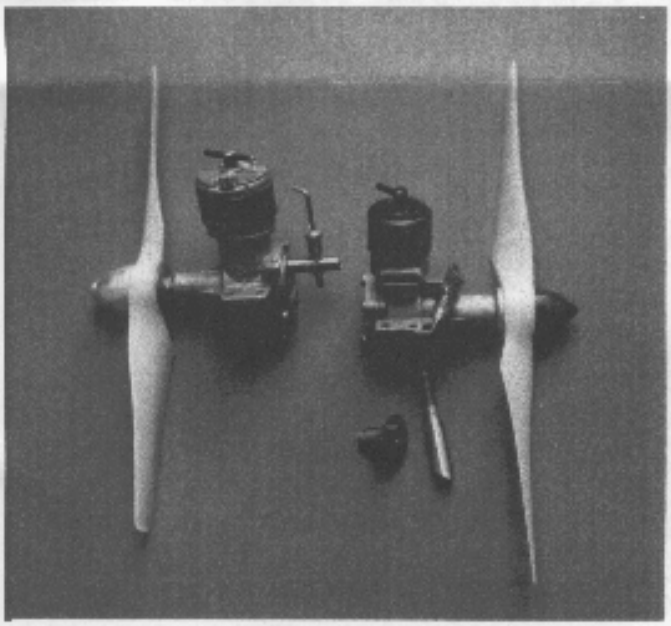
The Delta 490 could never match the quality and performance of the Gordon Burford SABRE engines and in 1953 the SABRE 29 glo was produced in limited numbers to more than match the DELTA engine. In 1954 the front rotary DELTA 490was produced and the ones assembled by Monty were quite good running engines. The person that test ran the Delta engines at this time was Rob Thompson who learnt much about aeromodelling from Bill Evans and Monty. In 1956 Rob and Rex Myers started "Aeroflyte" with a couple of C/L kits in production, plus other model products.

Small British Diesels.

The British in the nineteen fifties were the experts in making small diesels of 1cc and under. The Mills .75 began in 1948 and engines are still being made today, based on this engine with sizes from .25cc to .75cc capacity.

The longest running engine would be the Allbon /DC Dart .55cc that started in 1951 as a design by Allan Allbon, taken over by Davies Charlton, later made in the Isle of Man and ended in the late eighties as Quickstart engines. About 1991 P.A.W. produced a design based on the engine, this being the P.A.W. 55, now using a single ballrace for longer engine life and better running.

I have included a photo of a couple of 1cc diesels, the first [left engine] being the E.D. BEE 1cc Mk 2 diesel. This engine, including the Mk 1 model that began in 1948 was the largest selling engine for "Electronic Developments" that also produced early radio equipment for model aircraft.



The E.D. BEE engines were low cost and sold 300,00 units over about 15 years of production. I was recently running my Mk 2 Bee and it was easy starting and very flexible as it would run at a tick over. If you want some Nostalgia build a 36 inch span "Tomboy" fit a Bee or Mills .75 replica [Indian] and have some fun flying F/F, when the weather is calm. I find that the models of about 3 feet span are great at normal radio flying fields when you have calm weather and the radio flyers have gone home. These two engines can be throttled back so that the model climbs very slowly, with little risk of getting caught in a thermal.

The other engine shown is the M.E.Heron introduced in 1960 and made in the Isle of Man by Megown Engineering. This engine has lots of power, so use a small clear fuel tank with limited fuel and a short engine run.

The small replica diesels of about .5cc use very little fuel and are very quiet and will fly a light model up to about 36 inch span.

Missionary Work in East Gippsland By B2

There exists in far East Gippsland a near complete vacuum of Old Time Flying, there are many older flier-builders but until a small intrepid group actually took up the challenge to show & tell of the joys of OT flying nothing was going to happen.

It was near mid winter; far from ideal, but the word had gone before in the region and early on Sunday 7th August a great crowd of around 40-50 locals were on hand to receive the word of the four missionary types, one of whom had travelled over four hours to spread the good word.

First on the scene at nine was B2 rather off-put by the large crowd waiting for action, despite wind gushing mightily; so after finding a sheltered spot the Anderson Pylon was assembled and firmly tied down, that was as far as any Texaco model was going in the conditions. An attempt was made to put a Stardust up but it was blown about something fierce, a rapid change of wing plus lead ballast had it nearly flying.

A great deal of interest was shown about ½ A Texaco when the benefits of low cost and large entries where given.

Fred Stebbings, Chris Lawson and Kevin Fryer arrived to lighten the burden, though in the conditions not much flying was able to be shown. Kevins Atomiser 1/2A had the crowd astounded at the height it got in the wind, whilst the Burfords of Chris and Kevin managed to put up watchable flights.
Fred bought out an OK Super 60 and a Super Cyclone for show and tell, this did spark up a couple of elderly modellers.
With the benefit of hindsight it was felt the harsh conditions on the day didn't allow much by way of flying, the McCoys were left at home so as not to frighten the natives, but some felt that, had they flown, the spectacle may have livened things up somewhat. The prospect of an actual O/T event at this great Sale facility was mooted and it could be a better way of spreading the Olde Timer Gospel.

B2.

CONTEST CALENDAR

Contest flying begins at 10am unless otherwise stated.

2005

Oct. 1-2nd Eastern States Gas Championships Wangaratta [WAM]
Sat. GB & Duration.
Sun. 1/2a Texaco & Texaco.

Oct. 1-20th 1/2a Texaco...Frank Ebling Memorial Postal Competition.
3 attempts to make 2 official flights [not the best 2 out of 3 flights]
Results to Peter Hosking by 30th Oct. 2005. peterh@webaxs.net or 52485461.

Nov. 5-6th 6th Annual Fly In at Echuca [EMMAC]
Sat. 1/2a Texaco & Duration.
Sun. Texaco & GB, Nostalgia Combo.

2006

Jan. 14th Sat at Swamps, 1/2a Texaco, Fly & Glide & 38 Antique.
15th Sun at P&DARCS 21st Annual Roy Robertson Memorial Trophy.
duration & Texaco.

Feb. 6 Sun. 3rd Annual Wesburn Fly In at [MRCAC]
1/2a Texaco, GB. & Texaco. 3 rounds each.

Mar. 4th & 5th Victorian State Championships at Cohuna [CMFC]
Sat. 1/2a Texaco & Duration.
Sun. Texaco & GB, Nostalgia Combo.

Apr. 14-17th 14th Easter Annual Fly In at Swan Hill [SHMAC]
T.B.A.

Apr. 22-29th Australian National Championships. At Loxton, South Australia.

???5th Annual Leopold sometime.
Meeting # 99 22 September 2005 @ 7-30pm @ Saturn Hobbies.
Meeting #100 24 November 2005 @ 7-30pm " "

Making your own ENGINE

Dave Sugden continues his series with materials and casting

Pattern (rear) and casting (front) are for Dave's next engine, to be described at the conclusion of this series.

Materials

The efficiency with respect to size, power and weight of an engine depends to a large extent upon the choice of materials. All engines depend upon bearing surfaces of one sort or another and the better the bearings the greater the performance. Good plain bearings consist of one very hard surface bearing against another which is tough and malleable. The softer surface then runs in and work hardens to mate perfectly with the opposing part, usually the shaft. This principle, together with other requirements of the parts determines the choice of metal.

Cylinders when run in must have a glass-like surface, so that if they cannot be hard chrome plated or case hardened, a work hardening steel, *i.e.* one containing chromium or nickel, or molybdenum iron must be used. A high tensile steel S82, S96, or such as that used for car half-shafts is very good. With surface or heat treatment a mild steel is the best choice, *i.e.*, S.1, E.15.

Pistons are best made from cast iron because its porosity results in it being very difficult to seize and having long-wearing properties, due to the oil and graphite which its surface retains. Mechanite, having a fine grain structure and globular graphite inclusion, is best. Centrifugally cast iron rod is next best since it has a fine uniform crystal structure but plain cast iron is quite good enough.

Crankshafts must withstand high stresses due to the piston and crank loading and require to be strong and tough. They must be capable of being bent without cracking and must work harden. A high tensile steel is called for, *i.e.* S96 or a piece of car half-shaft. Case hardening is not recommended because of the uncertainty of the depth of the brittle surface. Hard chrome plating would be advantageous but remember to allow for the thickness of the plate, about ·0003 in.

Connecting Rods have to be very strong and light and must possess good bearings. Super dural of about 38 tons/in², is ideal, *i.e.* DTD 363 or DTD 683. Pure aluminium is useless but ordinary alloy good enough.

Crankcases are usually cast from DTD 424, a general purpose casting alloy containing silicon used in foundries. It is rather soft and superior metals are Y alloy or RR 56, *i.e.* car or aero pistons.

General parts such as the cylinder head, carburettor and driving disc are catered for by ordinary alum. alloy rod but of course the stronger this is the better. The spray bar can be turned from alum. or brass but since the needle cap is soldered to the needle, brass is used.

Phosphor bronze is a good bearing metal for crankshaft journals and con-rod big ends, but cast iron is just as good for the former. Ground silver steel is the gudgeon pin material. It is also useful for making special tools when hardened and tempered for work on the softer metals. Magnesium is beautiful to machine but is structurally weak. It requires chromate treatment to render its surface inert to the various corrosive chemicals in fuel. Tufnol is light and strong and is highly resistant to wear, especially where no lubrication can be permitted. It may be used for disc valves.

Pattern Making

This should be relatively straightforward for aero-modellers though there are a few points to note. Any part of the pattern which has to be drawn out of the sand in the moulding operation should possess a slight taper to facilitate this, although on castings of our size this is hardly necessary. It would be appreciated at a foundry where the casting was being made and would indicate which way you wished the pattern to be set in the mould.

Balsa is suitable for patterns but because of its absorbent nature must be given several coats of pigmented dope to harden the surface. Patterns must be capable of withstanding rough treatment as they are liable to be hit during the ramming process of moulding. All lugs and projections should therefore be notched in. Machining is often simplified by the addition of an extra boss which can be gripped in the chuck whilst machining proceeds and which is parted off on completion of the part, see *Fig.* 1.

Coring Out

A pattern made for a cored out casting has bosses attached to the faces into which the cores will enter, see *Fig.* 1. The mould is made in the usual way with the cores arranged to lie on the dividing or parting lines. The cores are made from a special sand mixed with a binding agent such as linseed oil and are baked hard before being placed into the mould in the core prints left by the special bosses. This is a rather tricky process best done at a foundry.

Fig 1

LEVEL TO WHICH PATTERN IS BURIED IN THE HALVES OF THE MOULD

One difficulty which occurs with using cores is that there is no metal on which to scribe the centre through which the boring and other machining takes place. It may be possible to set the casting up on the outside surface but this will most probably not be true enough for the accuracy of 1 or 2 thou., which is required. Cores are most useful, however, for cutting down [illegible] time and for [illegible] a cylinder casting, when setting up for machining can be accomplished without difficulty.

Chucking

The [illegible]

[illegible]

Causes of defective castings. By understanding some of the causes of blow holes and other defects of castings, certain points of moulding and melting will be made readily understood. Uneven cooling of the metal, caused by non-uniform volumes distribution of the casting, results in one portion solidifying before the rest. When this happens the large contraction of aluminium alloy causes cracks or draw-holes at the junction of the regions of unequal volume. Putting cores in a casting brings it to more uniform proportions eliminating the trouble, which is most likely to occur at the junction of the crankshaft housing with the main body of the crankcase.

Blowholes are caused by the inclusion of air that cannot escape due to poor ventilation. The positioning of risers and air vents, made with a knitting needle, is of utmost importance in the production of sound castings and only comes with experience. However, with a bit of imagination the requirements of a small crankcase can easily be catered for.

Porosity may be found in castings made at a foundry due to a cleansing pellet, added to the molten metal for purification purposes, not being allowed to complete its action before pouring.

Arrangement of the mould. The pattern may be arranged in the mould either with the parting line in the plane of the lugs, as shown in *Figs.* 2 and 3, or along the line of the shaft and up the cylinder, or on an ETA type crankcase across the cylinder. Whichever way is chosen the pattern must be capable of withdrawal from both sides of the mould. Porosity usually occurs in the uppermost regions of aluminium castings which should be arranged to be the part which will be machined away, i.e. where the cylinder fits. The method shown has been found to give the best results.

Moulds may be made from black sand (sand and coal dust moistened with sufficient water to make it bind and feel cool), plaster of paris and steel. Steel dies are only used for mass production of accurate castings and will not be dealt with.

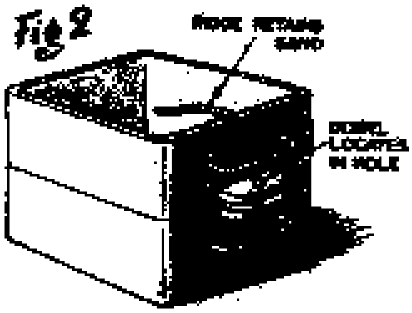
Sand Moulds. One half of the moulding box, *Fig.* 2, is packed level with sand and the pattern is pressed in to the level of the parting line. The sand at the edge of the pattern is levelled off and a fine sprinkling of dry parting sand is given to prevent the halves of the mould from sticking. This is the odd side which is not used for casting.

The other part of the box is fitted and twisted clockwise to take up any play. Fine red sand containing a little more moisture than the black sand is riddled into the box to cover the pattern and the remaining space is filled with black sand. This is rammed down fairly firmly with a tool of the type shown in *Fig.* 4, a process requiring skill to accomplish correctly. More sand is added and rammed down until the box is levelled off. [illegible]

[illegible]

metal to flow into all corners, driving out all occluded air.

A bush into which the metal is poured is made by packing sand into a metal ring which is placed on the entrance of the runner.



MOULDING BOX

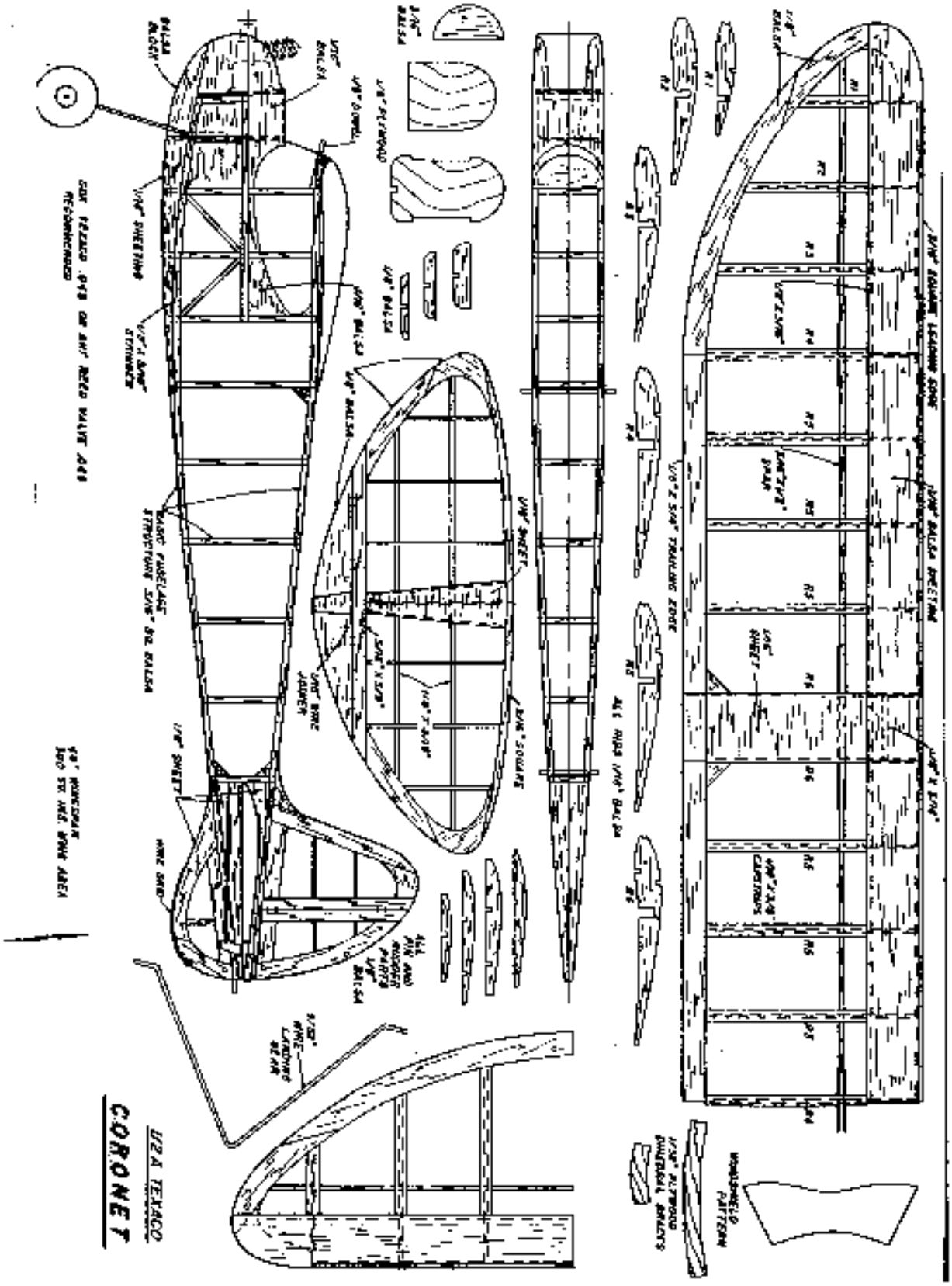
Before the box is finally assembled, not forgetting the clockwise twist, the mould is dusted with graphite to impart a good surface finish to the casting, and all loose particles of sand are blown out. With large castings a heavy weight is rested across the top of the box to prevent the internal gas pressure from separating the mould.

Plaster of Paris Moulds. A similar procedure to that used with sand is carried out with the exception that an odd side is not required. Runners and venting are similar. The important point is that the mould must be allowed to dry for 2 or 3 days and it is best to leave it in the oven to drive out all moisture, otherwise when the metal is poured in, steam is formed which cracks the mould and ruins the casting. [illegible] can be used several times [illegible]

Moulding.

The melting point of aluminium alloy is about [illegible]

[illegible]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