The Thermaleer

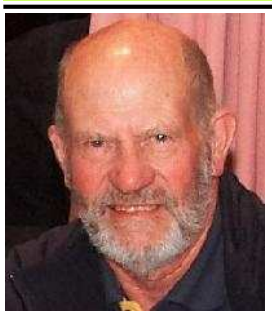
SAM 600 of Australia Newsletter Issue No.149 May - June, 2019

Winners of the first VARMS ½A Electric Texaco event 19th May 2019, at VARMS Field.
L to R: Kevin Fryer 3rd, Bob Wilson 1st and Bruce Clapperton 2nd.

NEXT COMPETITONS

September 21st-22nd	**ECHUCA** **Saturday:** 1/2A Texaco, Duration, Burford **Sunday:** 8.30 am AGM meeting, Texaco, '38 Antique, (Climb & Glide)
November 9th & 10th	**COHUNA** **Saturday:** 1/2A Texaco, Duration, Burford **Sunday:** Texaco, 38 Antique { Climb & Glide }
November 24th	**BALLARAT** 1/2A Texaco, Climb & Glide, Texaco

SAM 600 Australia - Victorian Old Timers Association Inc. Committee



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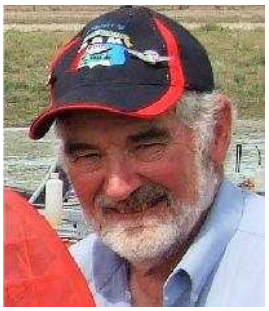

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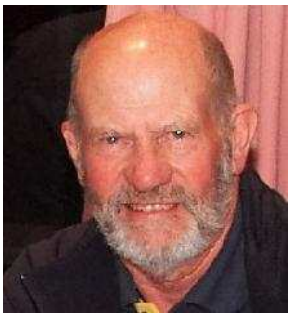
"The Thermaleer" is the official newsletter of SAM 600 of Australia, Victorian R/C Old Timers Association (SAM600) Inc.

FROM THE PRESIDENT Kevin Fryer.



Good news for a change. The VMAA and the MAAA have done a good job working with CASA to get us increased heights to fly our comps the details and locations are still to be finalised. So you can now dust off your models and build some new ones.

VARMS members organised and held the first oldtimer comp for this year at the VARMS field during May. This was a 1/2A Electric Texaco comp with 19 flyers taking part and a fly off was needed to decide the winner. See the report, results and great photos by Zdenek Busek in this Thermaleer. Steven Gullock saw the quality of the contestants and elected to hide in his car while the fly off was on. It was a very good day and apparently there will be more 1/2A Electric Texaco comps in the future. Thanks VARMS.

Also at VARMS, on Wednesday afternoons at 4.30pm, they have been running 1/2A Electric Texaco fly off practice comps. So far Sepp Kirschenhuber has the best time of 27min flying Gary Ryan's Airborne. Not bad for a first timer.

Bad news. There have been recent reports of significant 2.4Ghz radio interference at Mt. Hollowback / Bald Hills slope soaring sites near Ballarat. Interference has caused loss of control crashes and write offs for several flyers. The cause is under investigation at this time and we have a good crew working on this problem. I will let you know the results.

Now get back in the shed and finish those Old Timers.
Yours,
Kevin Fryer.

Despite WW II restrictions, Europeans continued to build and fly gliders. Today, they still have the best turnouts in Glider events at Old-Timer contests.

VARMS 1/2A ELECTRIC TEXACO EVENT
19th May, 2019

From Alan Mayhew and Brian Laughton. Photos by Zdenek Busek, VARMS.

On Sunday the 19th May at the VARMS field in Wantirna we had 19 competitors ready to compete with their electric ½A Electric Texaco models. There were mainly Varms members but also some visitors including SAM600 members Steve Gullock, Kevin Fryer, Col Colyer and myself. Others were Trevor Boundy from SWAMPS, Bob Wilson from Altona and Cliff McIver from Doncaster.

The weather was fine and sunny, the wind was light to moderate.

For these small light models this meant having the motor on much of the time to prevent the model from slipping down wind. This made the task quite challenging.

We decided to open up the cut-off dates from 1942 to 1956 therefore enabling anyone with this vintage model to have a go, and it did bring out 2 models, a Tomboy and a Skyrocket 44. Neither placed high but the chaps were at least flying older models, something that doesn't happen a lot. Also five of the models were donated by Gary Ryan as he has shifted house and run out of room. Thanks Gary!

We ran four 10 minute rounds of all in the air at once. The best 3 of 4 rounds counted, so that if you achieved three 10 min. flights you were in the final after lunch. Fifteen pilots made it into the all up, last down flyoff.

Due to the wind, it was risky to follow the lift down wind, especially if your battery was running low. Most kept their models up wind, some flew high to find lift but battled the stronger wind. Others kept low to catch smaller bubbles in the lower wind speed.

In the flyoff, after 28 or so minutes and batteries almost flat, there were three models still in the air, Bob Wilson (Stardust Special) Bruce Clapperton (Airborne) and Kevin Fryer (Stardust Special).

Finally Bob Wilson was last to land to take out the event. Well done to Bruce Clapperton from VARMS who finished 2nd with a borrowed model built and donated by Gary Ryan, and Kevin Fryer 3rd with his nicely kitted model.

Overall it was a great day with good camaraderie and good flying. With this level of interest more events are scheduled for next season.

Results
VARMS 1/2A Electric Texaco 19th May, 2019

1/2A Electric Texaco

Place	Name	Model	Rd 1	Rd 2	Rd 3	Rd 4	Fly Off	Total
1	Bob Wilson	Stardust	600	600	600		1728	3528
2	Bruce Clapperton	Airborne	600	600	600		1700	3500
3	Kevin Fryer	Airborne	600	600	600		1660	3460
4	Alan Mayhew	Stardust	600	600	600		1452	3252
5	Trevor Boundy	Albatross	600	600	600		1384	3184
6	Geoff Trone	Airborne		600	600	600	1235	3035
7	Brian Laughton	Albatross	600	600	600		1170	2970
8	Sepp Kirschenhuber	Chaoanger	600	600	600		1155	2955
9	Joseph Roshine	Stardust	600	600	600		980	2780
10	Henry Shapiro	Cumulus	600	600	600		838	2638
11	Col Colyer	Playboy	600	600	600		780	2580
12	Thomas Rawlins	Atomiser	564	600	600	600	767	2567
13	Xerrec Cooper	Cumulus	600	600	600		748	2548
14	Cliff McIver	Tomboy	600	600	565	600	706	2506
15	Steve Gullock	Lil Diamond	600	600	600		dnf	1800
16	Russell Pearce	Skyrocket 44	385	480	540	519		1539
17	Ian Slack	Airborne	555		600			1155
18	Max Haysom	Albatross	600					600
19	Bill Coombs	Airborne	25	354				379


Flightline ready to go


Tomboy

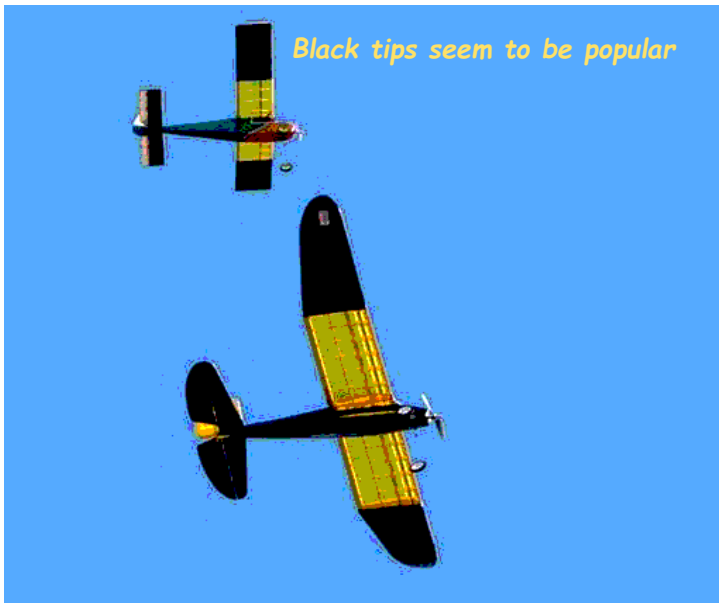

Comet Clipper

Mass Launch

Mass launch under way

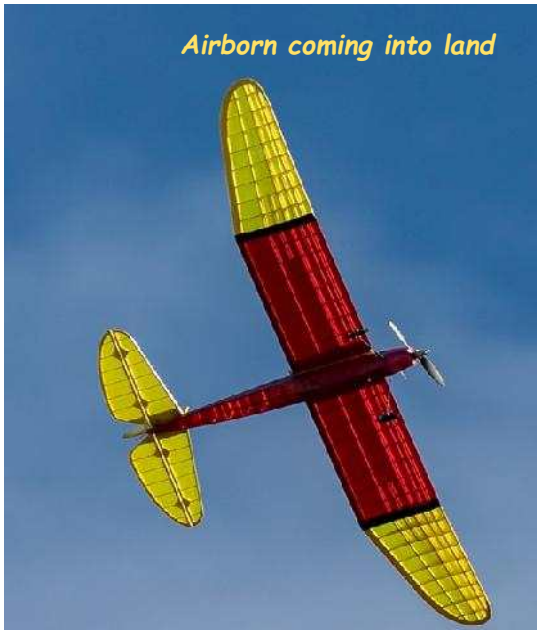
Brian Laughton's Albatross

Albatross attacks Airborn



Black tips seem to be popular

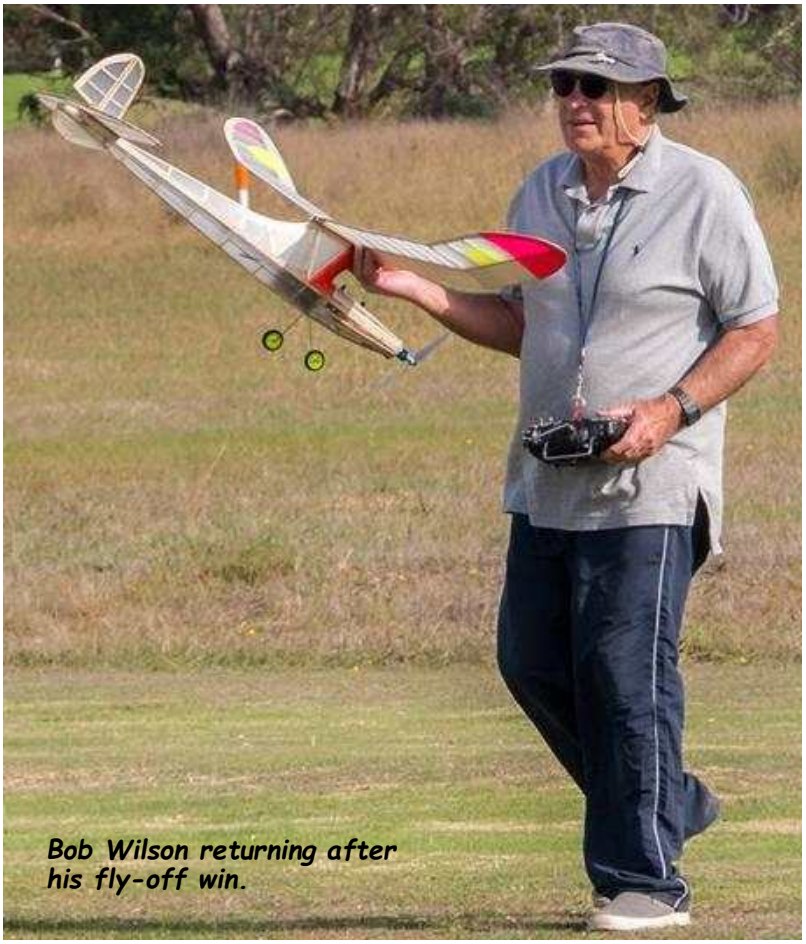

Looking for lift


Airborn coming into land


Pilot Box was a bit crowded


Winner Bob Wilson

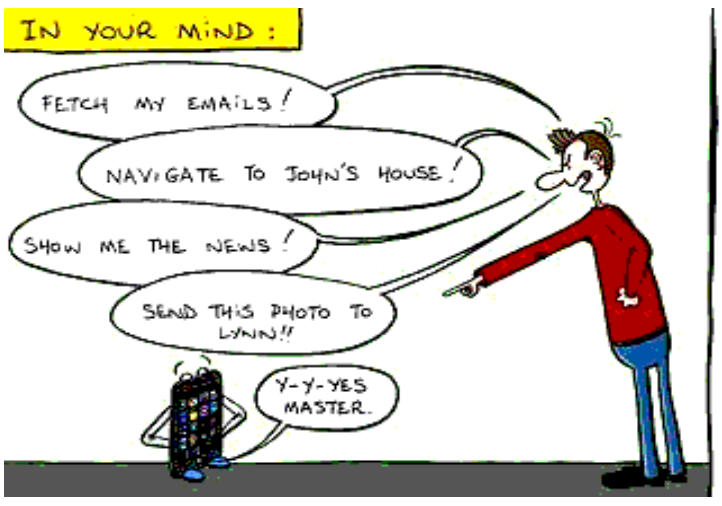

2nd place Bruce Clapperton

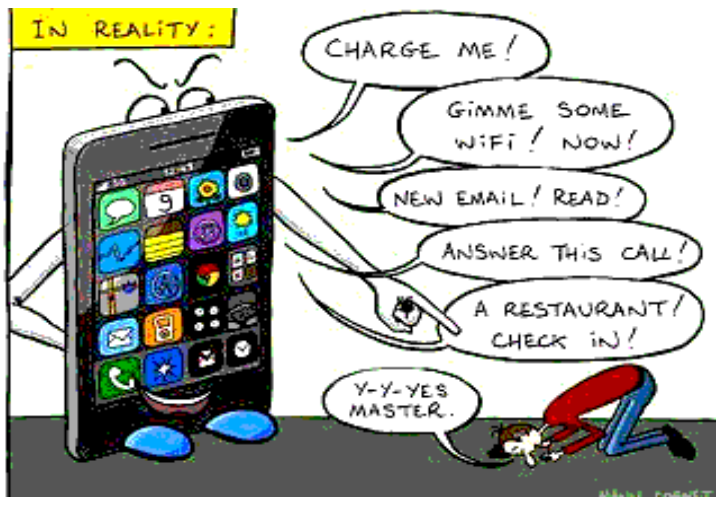


Bob Wilson returning after his fly-off win.

Kevin Fryer being presented with his 3rd place award.

Alan Mayhew landing his Stardust Special.





FOR OLD TIMER'S SAKE. By Don Howie.

SAM 1788 CHAMPS This is not a report on the Easter Event at Canowindra, that I enjoyed very much, with the excellent weather conditions. It is just comments about some interesting models.

President of SAM 1788, Peter Van de Waterbeemd, does an excellent job although I suspect it was easier this year with the reduced entries.

I think '38 Antique is my favourite event to watch, as I enjoy the old spark ignition engines running. A simple way to get into the event is to use a model like the Schmaedig Stick and a 5cc diesel, The GB1 5cc diesel is excellent but expensive to buy. Dave Paton does well with this model, taking 3rd place, using an ED Hunter 3.49cc diesel.

Peter (Condo) Smith has a good model with his Weather's "Westerner" powered with a Madewell 49 sparkie. These engines tend to break crankshafts if run too fast. Condo has fitted an OK Super 60 open timer, rather than the enclosed one, giving reliable running, as the model won the '38 Antique event.

Perhaps one of the oldest and best competition modeller still flying today must be Basil Healy. Looking back at Model News, February 1964, at the Multi Events R/C at the 17th MAAA Nationals, first place went to Tom Prosser and second place to Basil. Both were flying "Sultan" low wing models designed by Gerry Nelson with 10 channel reed equipment. I noted Tom Prosser was flying at the recent MAAA Nationals at West Wyalong. Photo shown is Basil's "Red Ripper" with Saito 56 power, flown in Duration.

FRIGHT This is actually two models, "Flea Fright", a 72" span glider with a V Tail, and "Fright" at 78" span used as a tug plane for the glider. Both were published in the September 1948, Model Airplane News.

The model, built by Brad Turner from Queensland, uses a K&B 40 rear induction F1 Pylon engine from the late sixties with a Dubb Jet tuned muffler. The model is covered laminating film plus Hobby King iron-on covering. The model was flown in the Nostalgia event at Canowindra.

Both "Fright" models were designed by Don McGovern and it was mentioned by Don, that he was tired of hand towing F/F gliders, so he devised a method of towing with a power model. A V Tail is used as the line to the glider is attached at the C of G position on the top of the wing. A normal fin would get in the way of the towline. The original model was powered with a Super Cyclone GR 60 spark engine and a timer was also fitted to the towline, so that the glider was released at first after 5 seconds.

I doubt many people ever built both models as they are quite a lot of work, with cowled engine etc. The original power model could be used in competitions, but it is not listed as a Nostalgia model in the John Pond plans list.

BACK IN S.A. I though it interesting to show the sticker for the 71st MAAA Nationals recently flown at West Wyalong, NSW. The model looks to be a Playboy and is certainly an Old Timer. The number of people entering this competition after Easter is not very high, compared to entries last Century. Most major events are now held over Easter and I doubt many people have the money, time and energy to then fly at the Nationals.

Back to S.A. where I live and I took my small "Sniffer" free flight model to Canowindra over the Easter period to fly late in the day, when it was very calm. It was flown just before dark

Peter Van de Waterbeemd with "Schmaedig Stick", GB 5cc Mk.1 diesel, 13½x6 Bolly Clubman prop, Hobby King covering.

Graeme Mitchell releases Peter (Condo) Smith's "Westerner" in '38 Antique. Took 1st Place.

Basil Healy's "Red Ripper" Saito 56 stroke in Duration lifting off.

and the engine run was just too long, as the glide is very good, the model seeming to land on the hill with trees, a considerable distance away. I could not find the model, but Garry de Chastel saw it land, just after coming out of the shower at the field. He then walked a considerable distance and found the model that I could locate.

The original 29½" span Midwest "Sniffer" kit designed for the Anderson Baby Spitfire .045 glo, introduced in 1949, is a classic kit, first selling for US$1.75 back then. It was never advertised until 1951, with a drawing in the America's Hobby Centre adverts (full page), and I suspect they sold quite a large number of kits.

Maris Dislers and I try to do almost impossible things, then write about it in Aero Modeller magazine. The American 2cc Deezil engine sold in the mid-nineteen fifties for US$1.95 was reported as impossible to start and run. It was made and sold by Gotham Hobby Corp. in New York.

Bill Britcher gave the Deezil to me and I managed to start the engine, but it did not run very well, so I loaned it to Maris Dislers. Maris got it to run quite well on 60% mineral oil and 40% ether. It was very messy with this mix that is needed to get it running. It was decided to fly it in a model and it is shown turning a 10x4 Tornado nylon prop quite nicely. The engine was flown free flight at Constellation M.F.C., with a full report in a coming Aero Modeller magazine.

Next is a rather rare model, that I am currently trying to get it to fly reasonably well. The original started life in 1934 as a 24" span rubber kit by Geo. D. Wanner & Co. in Dayton, Ohio, USA. It had wheel spats and I think it looked like a Hall Racer full size aircraft. It was named "Scarlet Tanager" after the American song bird.

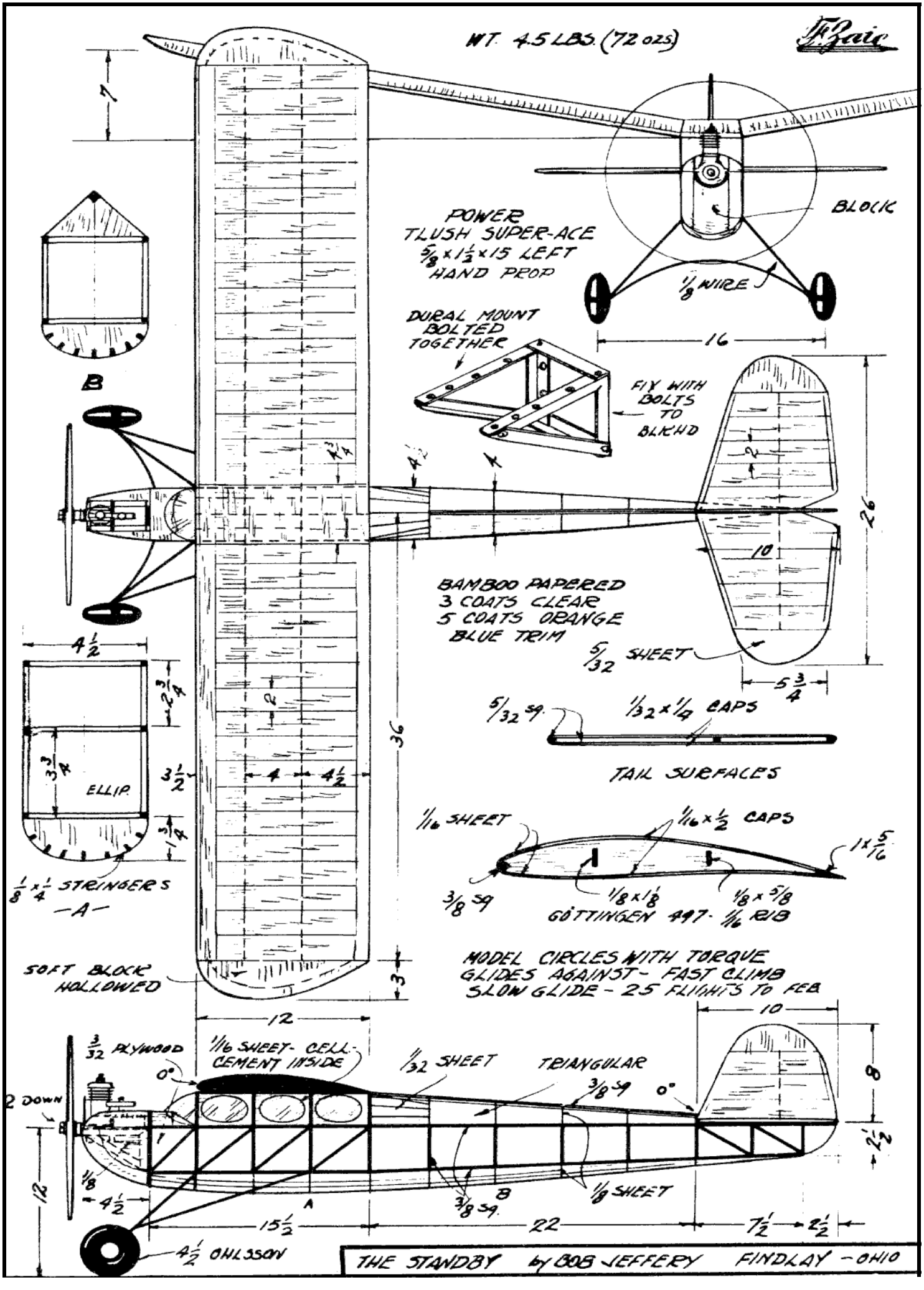
In 1938, the Ace Model Aircraft Institute drew a double size plan (48" span) using the Elf "Corncobb" spark engine. It was light weight construction as the Elf engine had very little power. Only three flights so far, many problems?

Canowindra SAM 1788 Champs, Brad Turner with his "Fright", K&B 40 rear intake F1 pylon engine with Dubb Jet muffler. Covered with laminate film and Hobby King covering.

Right: ***Midwest "Sniffer" 29½" wing span, designed in 1949, has DC Bantam .045 Glo, 6x4 Tornado prop.***

Bottom Right: ***"Heron" Gas Buggy, Airsail kit (New Zealand), has original US$1.95 Deezil 2cc (from 1950's) 10x4 Tornado nylon prop. Flown at Constellation by Maris Dislers. Free Flight.***

Below: ***Electric 48" span "Scarlet Tanager" 1938 design from Ace Model Aircraft Institute. Model built by Jack Simmons, re-***



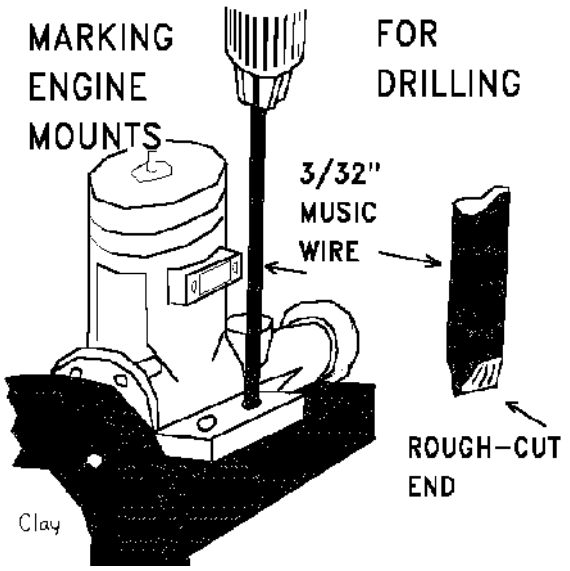
THE STANDBY by BOB JEFFERY FINDLAY - OHIO

Drilling Engine Mounts

When using those black plastic engine mounts, it's difficult to mark where the holes go to drill for the engine mounting bolts/ screws, and still have all the holes aligned, and the engine right where you want it.

One good way to do this is to have the engine on the mount, in the plane, aligned just how you want it. Then chuck a piece of music wire, 3/32" or so, about 4-5 inches long in your drill, with a rough cut end out, and use this to mark your holes.

With just a little pressure, the rough end of the wire will make a visible mark, and even chew a small depression in the plastic, giving you "center punched" marks ensuring proper alignment for drilling.



Rolled Tubes for Model Airplanes.

I came up with the idea back in 1956 of making a mandrel for a tapered rolled tube form with a straight mandrel and a sheet of butcher paper cut in a triangular shape, with one side longer than the other.

Someone may have come up with the method before me that I'm unaware of, but in my case, the idea came from, a grease pencil! You know the kind where you pull the string and tear off the paper exposing a new point.

The idea was born after trying unsuccessfully to find a machine shop to turn a tapered mandrel for a 1/2A Gas design that I was working on. (The ship, "Scataway" coincidentally, was approved for Nostalgia Gas, and was featured in Bob Stalick's column in the March 1999 Digest.)

From its humble beginnings, the system of creating mandrels and rolling balsa tubes has been refined-mostly from many years of building fuselages for rubber models. Here are a few that have been developed over the years.

A Simple way of determining the dimension of the paper triangle:
Take a long strip about ½" wide of the paper that you are using. Wrap it around the mandrel until it measures the diameter desired for the large end or slightly larger. Cut off the excess at this point, then unwind and measure the length. Repeat for the small end, and you now have the paper triangle dimensions without any math or graphs involved.

Creating strong, round and straight tubes:
A system was developed for creating strong, fairly stiff, round and straight tubes without the use of space age materials, which I'm sure would be frowned upon by the Nostalgia rules makers.

The use of silk or tissue inside and outside the tube will dramatically increase the strength and stiffness of the balsa tube. Dope down the silk or tissue to one side of the rough tube blank, which is 1" or 2" longer than necessary, and apply several coats of non-plasticized dope.

When dry, cut a couple of ¼" wide pieces off the end of the blank. Wet one piece well with hot water and wrap around one end of the mandrel until the ends meet. Cut off the excess, and measure the length. This will be the blank dimension for one side. Repeat for the other side and you will have the necessary dimensions for cutting the blank to size.

Soak the blank in water for at least a day. It takes a long time to properly soak a blank. If you are using a good piece of "A" grain, you will be amazed to find the blank will have almost rolled itself after a days soaking.

How to soak the blank:
I used to use the bathtub for soaking and used weights to keep it from floating. This created problems, as someone always needed the tub. I later came up with a much more compact way of doing it. I bought a length of 4" PVC drainpipe and two caps for about $10. A 4 ft. piece is cut off and a cap glued on one end. The pipe standing vertically is filled up with water. The blank is inserted into the pipe and a rag or something is wedged in to keep it from floating.

Rolling and finishing the tube:
Wrap the blank around the mandrel, tape the front with one piece of masking tape, then tape the rear with another piece. At this point you can sight down the tube and straighten the seam as well as possible. Apply tape to the rest of the tube with no more than 1/8" gaps between tapes.

Let it dry for a day or so before removing from the mandrel.

After gluing the seam, (I prefer slow drying 3-hour epoxy, which gives plenty of time to get the seam straight), put the tube back on the form, with waxed paper to prevent sticking to the mandrel. After the epoxy cures, sand and apply silk or tissue and several coats of non-plasticized dope to the outside of the tube. Leave the tube on the mandrel for a week or more until the dope cures out, and you will have a strong, straight stressed skin tube with little tendency of going out of round.

The process can be speeded up by leaving it in a car on a couple of hot days, or better yet leave it in an attic on a hot day. Mine gets up to 120 degrees or more in the summertime.

MVVS Diesel Conversion

Here is the installation that will fit in the Giant in the same way as the Forster.

So I set about breaking in the MVVS on a test stand. During this period I am relying on the advice of two experienced modellers, Tiziano Bortoalaiin in Italy, and Jack Hiner in Illinois, both perennial winners in Old Timer competitions and both MVVS users.

Tiziano advised me not to use an electric starter as the crankshaft does not take the abuse. So I set about running the beast initially with a 16x8 wooden propeller, flicked by a gloved hand in the old fashioned way. I found I needed to crank the compression screw way down to get it to fire. But it then caught quickly into that usual diesel rum....rum...rum… intermittent firing. And, like all diesels, as it warmed up it began to run regularly and then heat some more. It is customary to back-off the compression in this phase of starting until there is a balance between the compression and the heating. Problem was, the contra-piston became stuck and the engine would overheat. Another possible problem was the leakage seen around the compression screw. I couldn't understand how the contra-piston could be so tight and yet leak combustion gasses.

Here is the button which contains the contra-piston under the cylinder head. In this picture the contra-piston has been removed.

Hmmm...what to do. Well, let it cool off some and try again. Indeed, when it was just warm you could give it a heavy prime in the exhaust and when it fired the contra-piston would snap out to the next setting but I found it impossible to get the MVVS Diesel Conversion balance between backing out and overheating. Time to ask the experts. I was having this wonderful "conversation" with Tizianovia Facebook. Now Google Translator has a hard time with the technical terms involved but we managed to understand each other to some extent. Tiziano was suggesting I remove the cylinder head and either make the contra-piston fit looser or make a new one.

My concern, since I did not know the construction of the MVVS, was this would be a complicated thing to do. I was particularly concerned with the possibility the cylinder liner would need to be removed by heating etc. in order to gain access to the contra-piston. Many years ago I was thoroughly familiar with the construction and maintenance of model engines, particularly diesels, but I haven't worked on them for almost forty years.

Meanwhile Jack offered a Davis Diesel conversion head that would fit my engine. It features a looser fitting contra-piston with an O-Ring to ensure a good seal.

Well, it turns out the contra-piston does not fit in the cylinder in the old way, it fits in the head/buttons so removes from the engine with the four head screws. Here is the cylinder head and the button which contains the contra-piston. Also shown are the fixture (piece of pipe) and tool (1/2 inch dowel) used to knock out the contra-piston.

The construction of the contra-piston contains a hint as to the combustion gas leakage. It would appear that the part is made when screwed to a mandrel. The mandrel being separated when the machining is complete. I decided to wick some thin CA into this screw fitting from both ends. It won't take the combustion heat but it may carburize and seal the part.

Tiziano suggested the contra-piston was made from aluminium and being that it sits inside a bronze button there is a differential coefficient of thermal expansion between these two dissimilar metals. Indeed there is a difference so you wonder how it would ever work well, but may be there is a magic fit that makes it work so I decided to gently remove some material from the aluminum contra-piston. I glued the contra-piston to the 1/2 inch dowel, having first trued the end, then I mounted it in the lathe and gently rubbed the surface with a worn out piece of fine emery cloth. Easy does it.

Afterwards I removed it from the dowel, cleaned it, applied some anti-seize compound and re-assembled the motor. I ran out of time to run it but the procedure is so simple that I can repeat it in steps till I get it right.

Metal	Temperature Range (deg.F)	Thermal Expansion (micro inch/in deg.F)
Admiralty Brass	68 - 572	11.2
Aluminum	68 - 212	13.1
Aluminum Bronze	68 - 572	9
Cast Iron, grey	32 - 212	5.8
Iron, nodular pearlitic	68 - 212	6.5
Iron, pure	68 - 212	6.8
Manganese Bronze	68 - 572	11.8
Red Brass	68 - 572	10.4
Yellow Brass	68 - 572	11.3

HALF A COX ENGINES

BY TOM BOICE

SAM Speaks - March~April 2016

I hope these articles help to promote the Frank Ehling event in Half A Texaco event in SAM contests.

I am not an expert in any way on engines. My knowledge and experience comes from running and testing many combinations of cylinders, Cox components, and fuel. It was interesting to see the results of what works and what doesn't.

Most important for the Texaco engine is starting with a tank of fuel that has a certain energy content. Four things affect how long the engine runs.

First would be rpm, second would be friction within the engine, third is the fuel pressure within the tank, and fourth is the heat of the engine in flight. The longer the engine runs, the slower the rpm, the more the other factors become critical.

The first consideration in building a Cox engine is to match it with the plane you are going to fly. A long running 5-7 minute engine turning four to five thousand rpm with an 8x4 electric prop will best fly a model in the twelve ounce size. An engine run of 6400 rpm with an 8x4 prop will best fly a model in the 16 ounce range. A 20 ounce and larger plane needs 7000-7300 rpm to fly well.

A long running engine in too big of plane that barely flies is not a competitive plane no matter how long it runs. Cylinders are the big difference in how the engine runs. They come in single port and dual port, tapered cylinder and straight grind. Some have sub port induction.

Some come with numbers on the cylinders. The tapered cylinder was stopped on all cylinders except the TD and Killer Bee and Venom.

The older Number two and thin wall single port cylinder, work well for a long running engine. A more powerful engine can be built using the number 4 TD cylinder and lightweight piston. It has dual ports and tapered cylinder with sub port induction. This makes the most powerful duration engine, sometimes 7600 rpm with an 8x4 prop.

The Cox Texaco engine marketed as a long running duration engine does not have a tapered cylinder or sub-port induction and is basically a Black Widow engine. My tests indicate that it is probably not the best engine to use in the Half A event.

A word about pistons—the lighter they are the less power you lose in turning them. This gives you more power at the prop and more run time. The cylinder that performs the best, very powerful and long running, is the 1959 Cox Super Bee, the dual port tapered cylinder, the sub-port induction.

This engine is not easy to find. It is stamped P40 under the exhaust board. It usually takes a magnifying glass to see it. It came in the old 1959 Cox P40 tan coloured plane and had the cylinder inverted. The later Testor's P40 used standard production engines and the glow head came out of the top of the cowl.

I have found that using Cox stock parts, we can build many combinations of engines. Some thoughts on cylinder and engine combinations.

The Cox Texaco engine was basically a Black Widow engine in a different box. The five thin head was later added. It is the only useful part of the Texaco engine.

The combustion chamber and the hot nature of the plug make it a good choice for all engine combinations. The easiest and most practical engine to use for Texaco is the older number 2 cylinder. The cylinders made before 1969 are tapered so the piston runs with less friction.

Set up the head with three head shims, stainless steel reed, and an 8-4 electric prop. The engine usually runs about four minutes at 6600 rpms. This engine works well with a model that weighs 15-16 ounces. You can put a muffler on the engine and increase the run time to 6-7 minutes at 5000 rpms. This works best with a model in the 12–13 ounce range. It is advisable to put a 4 inch piece of Tygon tubing added to the muffler to tune the exhaust.

That will bring the rpm up 200 rpms.

Another cylinder combination is the older thin wall single port engine. It has a tapered cylinder and is a little more powerful than a number 2 cylinder. With an 8x4 prop it turns about 6900 rpm for three minutes and 40 seconds on methanol fuel. It runs well on alternative fuel mix, about 6900 rpms for about six minutes. Planes in the 16-19 ounce range work well with this engine.

A powerful engine can be made with the old number 4 D cylinder. It is tapered and has a light weight piston, dual port, dual booster. With an 8x4 prop and methanol fuel it can turn up as high as 7600 rpms for between two minutes and 45 seconds and three minutes and 20 seconds. It will work well with a plane between 16-20 ounces.

After years of testing, my favourite cylinder is the old 959 Cox P40 Super Bee. It is tapered and dual ported. They are stamped P40 under the exhaust port. It sometimes takes a magnifying glass to see it. This is a very powerful engine. It is also very fuel efficient. With an 8x4 prop with alternative fuel mix, it will turn 7500 plus rpms for five minutes. Good for models 16 ounces plus.

You better have good eyes with a 16 ounce model. It is usually out of sight in three to four minutes. A bigger plane works well with this engine.

I have some notes on test data on the different engines. It is located at the end of this report. Results will vary as I am at 1000 feet above sea level. Higher altitudes run slower, lower altitudes may run faster. All

engines were run on the same day with the same prop and fuel.

There is quite a difference in time and rpm with the number of head shims used.

Another way to change the run time and rpm is the fuel mixture. Standard Cox fuel is a blend of castor oil, methanol and nitro, usually 25%. I have mixed up countless different batches of fuel and have settled on a mixture of 15% oil containing at least 50% castor in it, 12% nitro, 72% methanol.

You can lower the oil percentage, and gain energy and run time. The trade-off is the friction can increase and nullify the gain at some point. You can lower the nitro and the engine will run longer but with less power. The nitro is a good oxidizer and creates much needed heat.

The alternative fuel I use is a blend of methanol, ethyl alcohol, castor oil and nitro. You can see by the number of head shims used that it likes higher compression and a hot glow head. It is fussy to use and tuning the engine takes time to get used to.

Once you decide what engine you want to put together, the first thing I do is break it in like it is new. I put a small 020 prop on the single port engines, and a 5x3 prop on the dual port engine. I will fire the engines up and run one tank rich, then run five tanks at peak rpm of 16000-18000. This really helps to steady engine rpm.

Then put on the 8x4 prop and test for engine run time and rpm. Start with one shim. If the engine flickers back and forth, it means it is over compressed. Add shims until you get the best results. As many as 5 shims may be necessary.

Tuning a Cox engine can be a challenge. The two factors you must contend with are heat loss and fuel pressure change. The pressure change comes from the fuel tank when it is full. There is a slight amount of positive pressure because the pick up is below the top of the fuel line.

As the fuel in the tank goes down, it must be sucked up, creating a negative pressure. A negative pressure can lean the engine out. The heat factor comes when you launch your plane. There is more air cooling the engine as the plane flies thru the air. As the engine cools, it wants a richer mixture. At the same time, the engine is running leaner because of the negative fuel pressure. It doesn't take long before the engine quits. You may think the engine got hot and quit but more likely it got cold and quit.

One easy way to tune an engine for a beginner, is to know how long the engine runs, lets say three minutes.

Start the engine, top it off, and time it. After two minutes of run time, tune the engine to peak rpm. Then fill the engine and launch. Tip - also remember where the needle marker is set. On the next flight you can use the position to richen or lean the mixture on the next flight.

The heat issue can be addressed two ways. First you can increase the nitro content of the fuel. The second is to insulate the cylinder. I usually cut a strip of a cotton rag and wrap it around the head, being careful not to cover the exhaust port. If you tune the engine correctly, it will run rich, then peak, then lean.

When you go for a longer running engine, you are stretching out the same fuel over a longer time, magnifying the heat and pressure challenge. For those who like to tinker this is a lot of fun. For me, I will run the P40 and go for the clouds.

I hope this gets your interest up to fly in the Half-A Postal Challenge.

Building a Texaco 049 Engine

Step One

When you purchase the 049 engine it is best not to try to run the engine. Start by disassembling the engine.

This is a simple five minute job. Pull off the plastic pick up tube. It is usually hard. Throw the tube away.

Assuming we are using an old Babe Bee. Pull out the retainer clip and remove the reed, usually a copper one.

Step Two

Put all the parts in some type of cleaner. I use carburettor cleaner with a dip basket. Let it soak for one to two hours. Don't leave it overnight or forget and leave it for a long period of time or the parts may become tarnished.

Step Three

When parts are ready to come out, put on rubber gloves as the carburettor cleaner is toxic. Find a cup or a can and fill it one half full with denatured alcohol. This is less toxic than methanol alcohol. Methanol can be absorbed thru the skin and cause health problems. A toothbrush and Qtips are good tools to clean parts. Clean parts, then pick out the venturi gasket and head gasket carefully. The head gasket can be reused. Give special attention to the back plate. If you have compressed air, blow out the venture passage and fill tube.

Step Four

The goal in putting this engine back together is to make sure it doesn't leak fuel or air and has a pick up tube that completely empties the tank. The pick up tube requires a drill press and a length of aluminum 1/16 outside diameter tube.

Step Five

Take the back plate and put it on the drill press table. Chuck up a 1/16 drill bit and set the stop on the drill press so the drill bit can't go any deeper than the casting.

The nipple is protruding from the casting 5/32 of an inch.

Caution - you are going to drill inside this nipple 5/32 deep. Go slow and be careful or your drill bit can come out the side. Ask me how I know!

Caution - don't drill too deep or you will get into the needle valve housing and venturi. Bend a 1/16 diameter tube and clear the tank intake tube and cut the length so that it is right on the bottom of the back plate on the tank line. Rolling the tube with a razor blade or exacto knife makes the cutting this easy. Sand with fine paper and make sure there is no foreign matter in the tube.

Step Six

Gluing the tube in the nipple is one thing I have not perfected. Most adhesives including JB weld will not hold up to alcohol and nitro methane. The best I have come up with is to carefully glue the tube in with JB weld. Be careful to put a small amount on tube only. Sanding the tube helps adhesion. Let cure overnight.

Step Seven

Next put a small amount of silicone around the nipple. While it is still wet slide a 1/4 inch heat shrink tube over the silicone and shrink this to protect the JB weld. Even if the JB weld fails, the tube will still work pretty well.

Step Eight

The tank is next. The back plate and tank almost always leak. One way to solve this is to clean the tank groove. Fill the groove 1/3 to ½ half full with gasket silicone. Work around with a Qtip and let cure overnight.

Step Nine

Next install the reed in the tank. The best reed to use is a stainless steel reed. The old copper reeds work pretty well. Do not use Teflon reeds. They work poorly at lower rpms.

Step Ten

Back plate screws are always a problem with threads holding all kinds of foreign matter. A nice touch is to chuck them up in a drill press or lathe and file off the sharp part of the threads leaving the last 1/8 inch in full thread where it goes into the crank case.

Step Eleven

Needle valves all seem to work equally well. The important thing to do with a needle valve is to cut or paint an indicator line so you can see this when you tune the engine.

Step Twelve

Next is the Venturi Gasket. Make sure the gasket is new. Either buy one at the Cox Supply or you can make your own with black fuel tube slid inside of a brass tube.

Using a razor blade, cut thin gaskets off of the fuel tube using the brass tube as a guide. It may take making more than one to get a good one. Hint - I find it easier to wax the razor blade. It cuts with less drag and makes a truer cut.

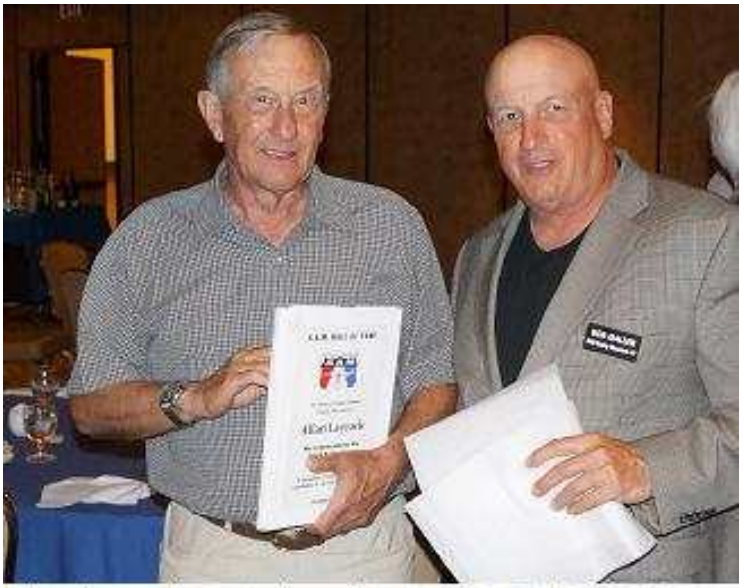
Step Thirteen

Reassemble the engine with a new crank case to tank gasket. Oil the piston and crank. Install cylinder and piston in the crankcase and assemble tank with the back plate. That should complete the assembly. Last but not least - Fill the tank with fuel and check for leaks. One spot to watch is the back plate screws. If one is leaking, remove it and put a small amount of silicone on it. The engine is now ready to run.

HALF A COX ENGINES - TEST NOTES FROM TOM BOISE

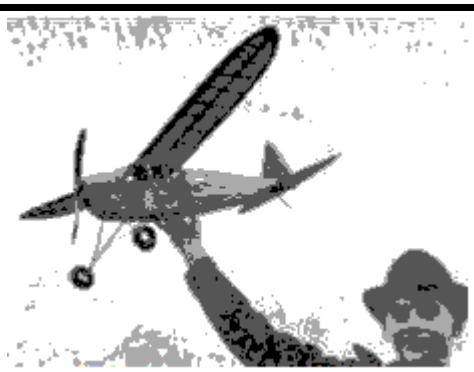
Cylinder No.	Prop	Shims	Fuel	Muffler	RPM	Run Time
P40	8 x 4	3	Methanol	No	7500	3.00
P40	8 x 4	6	Methanol	No	7600	2.48
P40	8 x 4	1	Alternate	No	7600	4.45
P40	8 x 6	1	Alternate	No	5300	7.20
P40	8 x 6	1	Methanol	Yes	5400	5.10
P40	8 x 6	3	Methanol	Yes	5350	5.27
P40	8 x 4	3	Methanol	Yes	6900	3.45
P40	8 x 4	4	Methanol	Yes	6700	4.46
N-2	8 x 4	1	Methanol	No	6600	3.56
N-2	8 x 4	3	Methanol	No	6600	4.25
N-2	8 x 4	1	Alternate	No	6400	6.30
N-2	8 x 4	1	Alternate	Yes	5000	9.30
N-2	8 x 6	1	Alternate	Yes	3800	12.45
N-2	8 x 4	3	Methanol	Yes	4600	7.20
N-4 Tee D	8 x 4	3	Methanol	No	7300	2.24
N-4 Tee D	8 x 4	1	Alternate	No	7350	4.12
Thin Wall	8 x 4	3	Methanol	No	6900	3.40
Thin Wall	8 x 4	1	Alternate	No	6900	6.14
Thin Wall	8 x 4	3	Methanol	No	7600	3.25

Australian Allan Laycock flew his Colibri to second place in the 36 inch glider event



Allan Laycock was inducted into the SAM Hall Of Fame. Here he talks with Rocky Mountain VP Bob Galler.


From the rear it has graceful and stable lines


This gives you an idea of its size


With its inverted motor and cabin it is neat and realistic

How to Build a Pee Wee Gas Model

Here's what you have been looking for
A 45 inch Model for "Small" Engines that is easy to Build, easy to carry and easy to fly

By
MALCOLM ABZUG and RICHARD WACHTELL

IT SEEMS only a short while ago that my collaborator and myself were members of that large group of model builders who liked the idea of gasoline-powered models but were unable to grow enthusiastic over their clumsiness, their short life and their high cost of construction and up-keep. However, at that time as if in answer to our unspoken supplication, the first small engine appeared on the market, the Elf engine, and in a few months, the first Shrimpo was dodging pop flies at the local ball park.

But this first model, and the second for that matter, were far from perfect for reasons that will follow shortly, and the third Shrimpo, the present one, was designed and completed at the end of last fall. After a few test flights winter set in, and veteran modelers will have no trouble recognizing the peculiar feeling suffered by model builders on getting up in the morning and listening to the wind howl outside while looking at a fine outdoor ship in the pink of condition just a-settin' ..... just a-settin'.

Foolhardiness and ingenuity overcame prudence, and in a week, we found ourselves possessors of the first indoor gas job ever built. The trick was accomplished with a nine foot high jump pole that was heavily weighted at one end, a ten foot length of tough fish cord, and a bronze bushing in these relative positions:

The pole stood in the centre of the floor of a small gymnasium. The cord led from the pole to the wing tip the "indoor plane" where it passed through a small bronze bushing at the center of pressure of the wing. A retainer at the top of the pole to prevent the cord from coming off and four strong, hard walls completed the picture.

With engine barely popping over and set for a run of 45 seconds, the S-3 rolled along the polished floor and gaining speed, picked up. Once in the air, for some unaccountable reason, the engine revived up, and in a few seconds, the pictures we were going to take would have shown a big blur at the end of a fish curd. By the time that the more timid spectators were retreating towards the doors of the room, the engine cut and when the plane touched the floor it was almost capsized by an immense concerted sigh of relief.

One more flight like this and miraculously, all our impatience for the spring vanished and the S-3 was gently and respectfully consigned to the shelf from which it had come.

You may be very sure that the next flights took place in the wide open spaces, but it was only after quite a few long, soothing, outdoor flights that I was able to carry the S-3 into a room without breaking out into a clammy sweat and looking furtively for a door.

As the indoor flights were notable for speed and danger, the outdoor flights were distinguished by absolute dependability and consistency.

In the first stages of adjustment, the model was unintentionally placed in what are dangerous positions for any model; steep right and left banks. The model was not of harmed on landing. Flights are uniformly fine, and climbs of over one hundred feet in the space of 45 seconds followed by long flat glides are usual. In take-offs, the S-3 actually beats the proverbial model: takes off on a dime and has a nickel left. The small size of this gas job has led us to make the wing in one piece and the tail an integral part of the fuselage. This considerably facilitates setting up for flight, and yet causes no inconvenience in transportation.

The S-3 meets all N.A.A. specifications for a Class D fuselage model.

CONSTRUCTION

Fuselage. But hold on for a minute. Before you pick up one piece of balsa, there is one thing that you must understand.

The S-3 is a gas job, that sounds obvious but consider it for a few moments. Did you ever hear of anyone skimping on glue or cutting holes and scallops in the longerons of a ten foot gas job? You didn't, and if your 44 inch gas job is going to be successful, no one will be able to say that you lightened it up in this manner. By making believe that your job is only an exaggerated rubber-powered model, you not only leave the job open to a major structural disaster, you are just begging for the opportunity to see a fine looking ship slowly go to pieces

before your eyes; a process which is impossible to stop. Of course the model must be kept reasonably light. This is accomplished by using medium outdoor stock throughout (the kind you would use on an outdoor weight rule model) except where otherwise specified. The sizes of the balsa used in this model are sufficiently large to permit this.

The fuselage framework is built of 3/16 square medium hard stock and all joints receive an extra coating of glue for strength. Pay special care to the alignment of the various members in the fuselage, as all settings are based on the fuselage framework. When the framework is completed, cut the two motor mount bulkheads labelled No. 3 and No. 4 out of 1/32 thick birch plywood or its equivalent in hard balsa, and glue them securely in place with cement.

These two bulkheads hold the motor runners in place and also provide a secure base for the landing gear as well as strengthening the fuselage in cross section. The motor runners are next secured in place. If the bulkheads are plywood, these tapered bass strips are glued with casein glue. The cowl for the inverted Elf engine which is used on this ship, is built up around the motor mount. The first step is to cement the two balsa bulkheads labelled No. 1 and No. 2 in place and to cover them with soft 1/16 sheet balsa.

Then cut out pattern No. 5 in soft 1/16 sheet balsa, bending it in place as shown, securely cementing it down. Then temporarily attach the rough blank of the hinged engine cover in place, and when dry, sand and cut it down so that it follows the lines of the fuselage and yet can fully enclose the motor. Pry it off and cover it with a good grade of silk, not necessarily the lightest available, using cement. Hollow it out carefully and replace it on the hinges that are used throughout on this model, the wire and tubing type. Be sure to place the hinges in the correct positions. Exactly the same procedure is followed in building the "trouble door" at the bottom of the cowl. When the entire cowl is assembled and covered with silk, it will look very realistic and yet offer easy access to the motor; an important feature when flying in very cold or warm weather. (Ask the man who owns one !)

It is assumed that when the fuselage sides were still pinned down to the plans, you installed the tail mount. If you have, the next step is to mount a solid landing gear and tail skid into your plane. The landing gear wires are bent from 1/16 round piano wire to the exact size shown and are bound to 3/16 square balsa strips which are in turn lashed and cemented to the fuselage framework and bulkheads.

No shock travel is provided for in this small gas job landing gear and performance proved that there was no necessity for it. The junction of the three landing gear wires near the wheel is firmly wrapped with flat rubber and shellacked and painted over to prevent oil and grease from reaching it. In spite of these precautions, the best rubber grows rotten after a while, and must be replaced. The same precaution applies to the rubber band that holds the trouble door in place.

The last thing to he done before the fuselage is covered is to build in a firm, tight battery box and to install the wiring circuit. It is also best to put the windshield and windows in place before covering.

The fuselage is covered with a good grade of light bamboo paper. The covering is tightened with water and a thin coat of dope is applied and sanded over when dry with ten-nought sandpaper. Two thin coats of coloured dope completes the job.

The windshield outline as well as separations between colours should he traced with 3/16 wide black tissue strips that are doped on. The best wheels for this gas job are air wheels of a 2-5/8" to a 3" diameter, which are slipped on to the axles and are held in place with rubber bound on the ends of the axle. If you were careful in building and colouring the fuselage, and if your cowl has been accurately made to expose only the prop and speed controls, your S-3 won't have to be ashamed of itself in any company.

Wing.

All the spars in the wing are very generously sized, and medium balsa will give it an ample safety factor. The main spar used in this wing is the super-strong box type, but it is fairly light. Its construction is quite simple, being no more nor less than two 1/16 sheet balsa sideplates separated at top and bottom by two 1/16 x 1/8 balsa strips.

This spar is built up before the rest of the wing is attempted and is left to dry while the ribs and tips are being cut. The rib section, the R.A.F. 32, is cut 18 times in 1/16 soft sheet balsa, and the tips are cut from 3/16 medium balsa stock.

When the leading and trailing edges have been cut, shaped and sanded, the work of assembling the wing takes place, one half at a time. In this process, the ribs are first glued on to the spar, then the leading and trailing edges are attached, the tips are added and shaped, and the small spars for the support of the sheet balsa leading edge, as well as the edge itself, are added to the wing structure. This sheet edge is made of very soft 1/16 sheet balsa and goes on very easily when held in place with pins. When all the joints are dry, the entire wing is sanded carefully and thoroughly, and the final check-up of the joints takes place.

The wing is covered and finished like the fuselage and should not weigh more than two ounces when completed.

The gas tank for the Elf engine is mounted in the wing and connects to the float chamber with a flexible rubber tubing than can be clamped to restrict the engine run to 45 seconds. The wing contains 275 square in. of area.

Tail.

The tail is highly tapered and looks very fine when mounted on the fuselage; it is efficient as well. The stabilizer is built up around an 1/8 square spar, and with the exception of this member, it is made of very soft balsa.

Rectangles made of 1/16 sheet balsa measuring 5/8" deep and the length of the ribs they represent are slipped onto the spar in their respective positions and glued. The leading and the trailing edges are added next and the ribs are trimmed to streamline shape. When this has been done, the stabilizer is pinned to the plans and the tips and other spars are added. Lastly comes the sheet balsa leading edge and centre section

and the final careful sanding of the framework. The construction of the rudder is very similar to that of the stabilizer, except that it lacks a spar in the centre.

The tail is covered and finished like the wing, and like the wing, great care must be taken to forestall any tendency to warping. When the tissue is tightening on the evaporation of water that was sprayed on, most warps occur. To prevent them at this stage, weight the surfaces down to a flat board with books, flatirons, or anything that is handy. The finished and painted stabilizer is slipped into its position in the tail mount and securely cemented into place.

The same goes for the rudder, and as a final touch, fillets are worked around the junctures of tail surfaces and fuselage. Make these of strips of bamboo paper in successively graduated widths. Starting with the smallest, these are cemented in place and smoothed down with a finger. (This method was originated by Ted Foti.) Do not forget to add a piece of soft 1/16 sheet balsa to the trailing edge of the rudder as shown. This little flap comes in very handy later on in adjusting the plane.

Colour the wings and tail to contrast with the fuselage. On the original S-3, the fuselage was light blue and the wings and tail orange; a very effective and visible combination.

Miscellaneous

As was suggested before, install the wiring circuit and the battery box before covering the fuselage. If you have made up your mind to be extremely painstaking and meticulous in building any part of your gas job, choose the wiring circuit as the object of your labour. (That is unless you actually enjoy cranking an engine for hours provoking occasional pops). Use a good grade of wire, such as Packard ignition wire, and make clean soldered joints wherever possible. Strive for a wiring circuit that is as much a part of your gas job as the longerons in the fuselage are.

This type of a setup, along with the large door in the side of the fuselage will settle your ignition troubles for all time.

A twelve inch prop is used on this model. It is made of basswood and follows the blank outline shown on the plans. This outline need not be rigorously adhered to, but use approximately the same area on your prop. It must be, of course, statically as well as dynamically balanced. Don't spoil a good job with a rough and pitted finish. Finish this prop as you would a large rubber powered prop; with dope, shellac and fine sandpaper. Do not be discouraged from spending several hours just making one prop by the thought that it will soon be shattered in a rough landing.

These small gas jobs seem to be very easy on props; we used the same prop on all three shrimpos. Those of you who are familiar with the subject of mechanics should be able to relate this fact to moments of forces and solve this phenomenon quite easily. There is a good physical explanation for the fact that one of our models glided head-on into a baseball backstop only nicking the prop slightly.

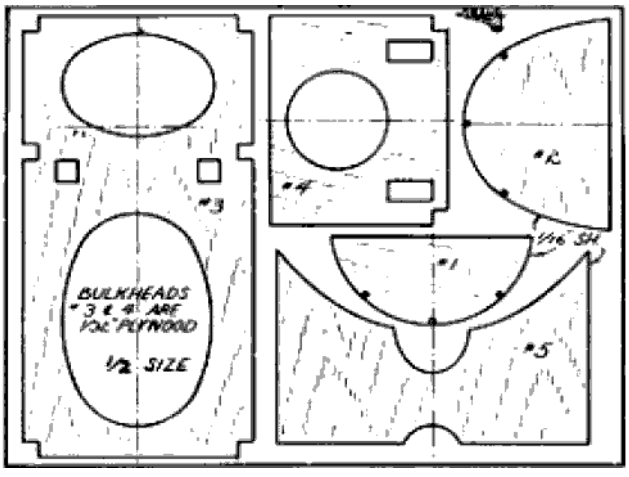
There are many ways to test a gas job. There is only one best way. Here it is. Take the assembled plane, ready for powered flight, to the top of a moderate slope. Before letting her take to the air for the first time, be sure it balances longitudinally when suspended at the wing tips at a point 1/3 back from the leading edge. Shift the wing or the battery box, or both, to secure balance. Then, heading the model into the wind, give it a gentle shove down the hill.

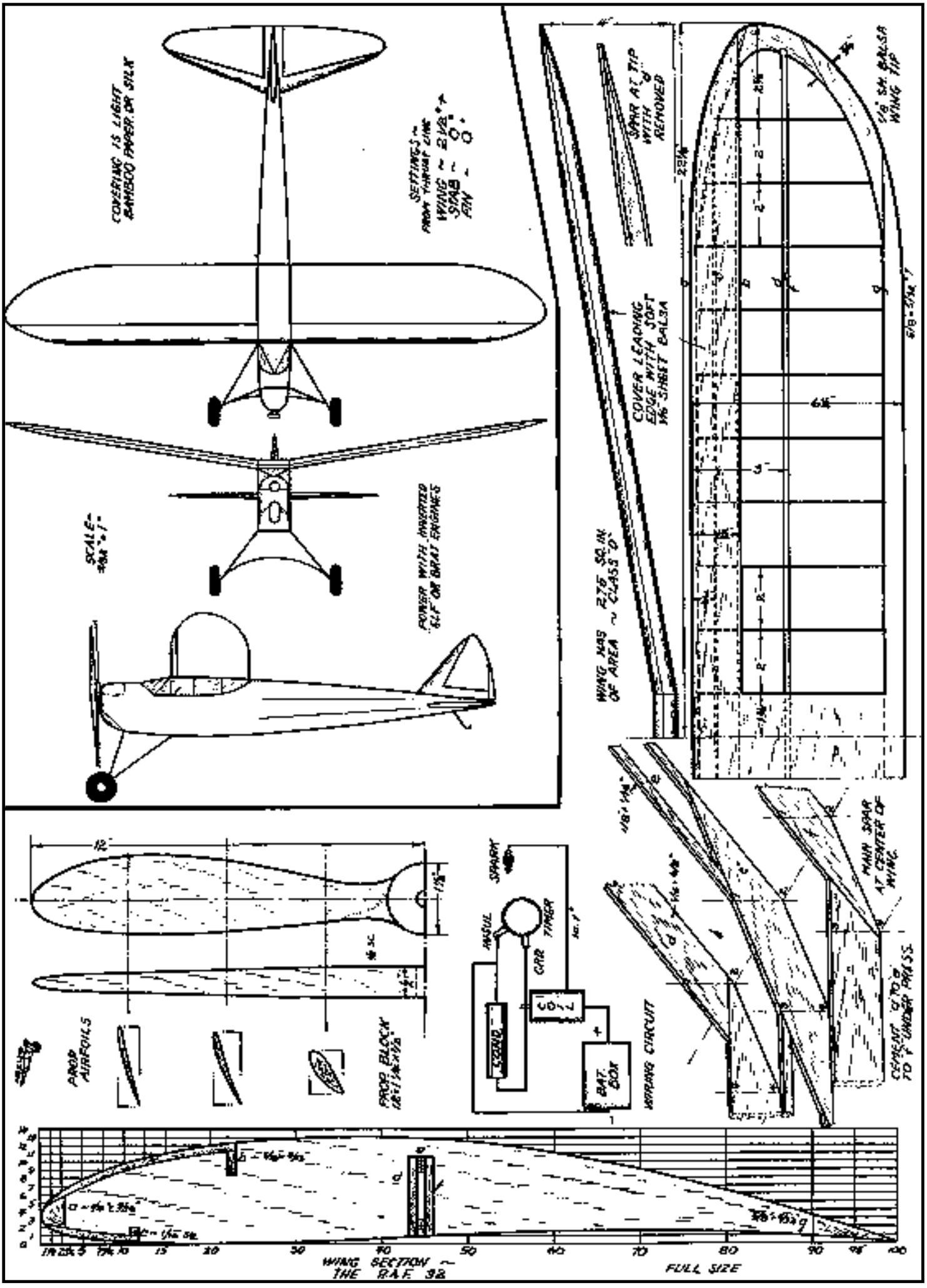
Keep this up until you can have the model just lift off the ground and barely skim along for ten to twenty feet, depending on the steepness of the hill. On these first test glides strive for a fast, level glide that is as nearly straight as possible. The model must not show the slightest tendency to stall!

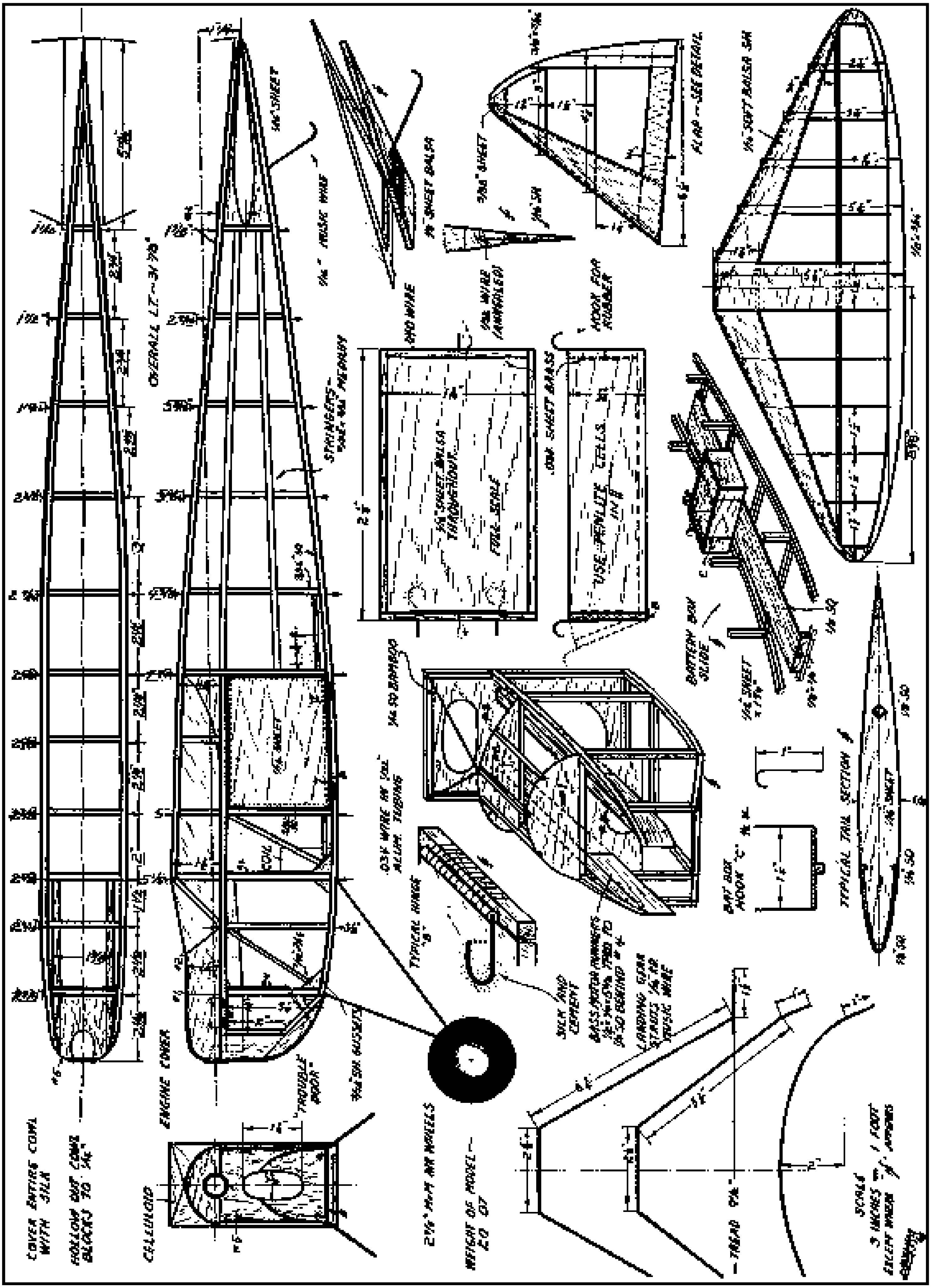
When this adjustment is reached, set the model down in a large clearing and start the engine. At this point instructions have to cease, for your conduct in the next minute or so is purely a personal matter. Some fellows will stumble along with their eyes glued to the model, oblivious of trees, bystanders or baseballs, and shout instruction and comment to what they soon discover is a somewhat deaf model. I know, because that is what I do.

However, when a sensible gas-jobber test-flies his model, he loses all personal feelings as soon as the wheels leave the ground, and retains but a faint academic interest in the proceedings. The latter method allows the builder to devote all his attention to the performance of his model, and his subsequent adjustments can be much finer. As a final bit of advice, remember that your gas job is a sensitive, finely balanced machine, and it must be treated as such. Do not harm the future of gas job building with careless, sloppy flying. We suggest that you register your model with the I.G.M.A.A. as soon as it is completed.

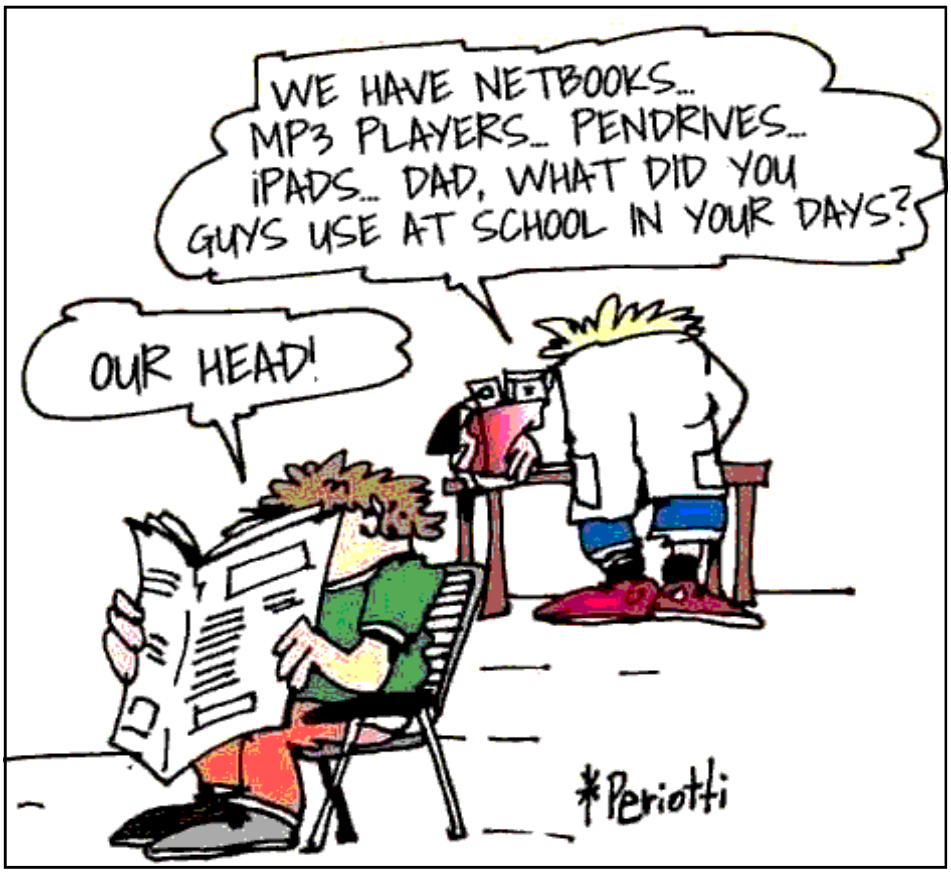
Lots of luck and many happy landings!




COVERING IS LIGHT BAMBOO PAPER OR SILK
SETTINGS ~
WING ~ 2 1/2°+
SCALE ~ 0°
FIN ~ 0°
POWER WITH INVERTED 6 CYL OR BRAT ENGINES
SCALE ~ 1"
WING HAS 276 SQ. IN. OF AREA ~ CLASS "D"
COVER LEADING EDGE WITH SOFT 1/16 SHEET BALSA
SPAR AT TIP WITH REMOVED
1/8 SH. BALSA WING TIP
MAIN SPAR AT CENTER OF WING
CONSIST OF TWO PIECES
PROP AIRFOILS
PROP BLOCK
SPARK
MANUAL
CAR TINGER
COIL
SPARK PLUG
BAT. BOX
WIRING CIRCUIT
WING SECTION ~ THE R.A.F. 32
FULL SIZE



OVERALL LT.—31 7/8"
ENGINE COVER
CELLULOID
COVER ENTIRE COWL WITH SILK
TYPICAL HINGE
SILK AND CEMENT
TYPICAL TAIL SECTION
BATTERY BOX SLIDE
FULL SIZE
FLAP — SEE DETAIL



Euro SAM Champs Photos from Ned Nevels

Testing the new E.D. BEE and

1960/61 series

E.D. BEE

.98c.c. diesel motor

TWO distinct models, plus several modifications, of the popular E.D. Bee 1 c.c. diesel have appeared during its 12 years of production. The original Series I type was actually the first engine to be featured in the M.A. Engine Tests and continued in production, with small modifications, for nearly seven years. It was replaced, in 1955, by the entirely re-designed Series II engine. In 1956, this model was provided with a slightly modified crankcase and a new cylinder in which the internal flute transfer system was abandoned in favour of three inclined 3/32 in. dia. transfer ports, fed by external grooves.

The latest variant, which has now been on the market for several months, has a number of further modifications. The transfer porting has again been modified, the port area being increased by some 137 per cent. by the substitution of four $\frac{1}{8}$ in. dia. ports, drilled through the cylinder wall at approximately 30 deg. to the cylinder axis. The skirt of the cylinder is also shortened and tapered to facilitate gas flow from the crankcase and thereby does away with the need for external transfer grooves.

A lighter piston is used together with a diecast, instead of a machined, valve disc and the crankshaft is now relieved at the centre to provide inner and outer journals $\frac{1}{4}$ in. and $\frac{5}{16}$ in. long, respectively. Externally, the new model is readily identified by a grey matt sand-blasted finish on the crankcase and cylinder head, and by a blued anti-rust finish on all external steel parts—cylinder, propeller shaft, compression screw, prop driver and all screws.

Until the advent of the latest version, the Bee has always remained, despite many changes, a relatively low powered engine, peaking at moderate speed. Thus M.A. performance figures ranged from 0.061 b.h.p. at 9,400 r.p.m. for the original model in 1948-49 to 0.064 b.h.p. at 10,600 r.p.m. for the 1956-57 model. This has certainly never been any obstacle to the Bee's popularity; its easy starting and generally docile behaviour being the features which have made it so successful with newcomers to the hobby.

In its newly developed form, however, the Bee breaks with this tradition completely. The transformation which has been brought about by this development is a revelation. Our tests were carried out on an engine submitted by the factory and the figures obtained might, of course, be slightly better than those of an average production sample, but there can be no doubt of the immensely increased power now delivered by the Bee—an output which, incidentally, bears comparison with the best levels yet realised in the 1 c.c. group.

The basic design of the Bee, which has always been somewhat unorthodox among small diesels, remains the same, i.e. loop-scavenged cylinder, disc rotary-valve and a transparent fuel tank enclosing the carburettor unit. The tank is suitable only for normal upright engine installation but is easily removable where it is desirable to invert or side-mount the engine or for other installations requiring a separate, and possibly larger, fuel tank.

Specification

Type: Single-cylinder, air-cooled, loop-scavenged, two-stroke cycle, compression ignition. Disc valve induction. Flat crown piston.

Bore: 0.437 in. Stroke: 0.400 in.

Swept Volume: 0.984 c.c. (0.060 cu. in.).

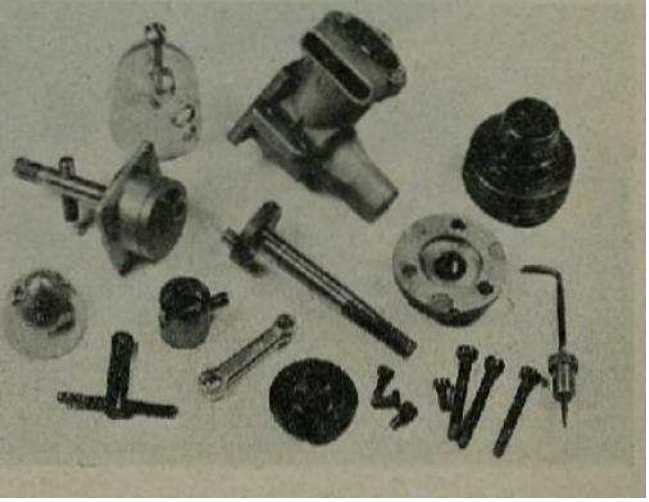
Stroke/Bore Ratio: 0.915 : 1.

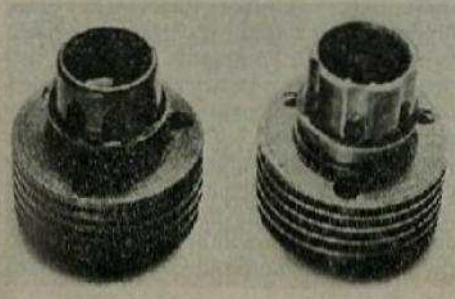
Weight: 3.3 oz. (including tank).

General Structural Data

Pressure diecast aluminium alloy crankcase and main bearing housing with integral exhaust duct. Detachable

Right—the parts of the 1960/61 model E.D. Bee.





Left—differences in the porting between this and earlier models are clearly shown.

flange-fitting rear cover with pressed-in intake tube and diecast aluminium alloy valve disc and secured with four screws. Non-counterbalanced disc web crankshaft with 0.242 in. dia. journals and 0.140 in. dia. crankpin and running in plain bearings. Steel prop driver taper fitted to shaft. Duralumin spinner nut. Cast-iron piston with fully-floating ⅛ in. dia. solid gudgeon-pin. Forged duralumin connecting-rod. One-piece steel cylinder with integral cooling fins. Pressure diecast aluminium alloy cylinder head. Cylinder assembly retained by three long screws into crankcase. Detachable clear plastic fuel tank. Spraybar type needle-valve beam mounting lugs.

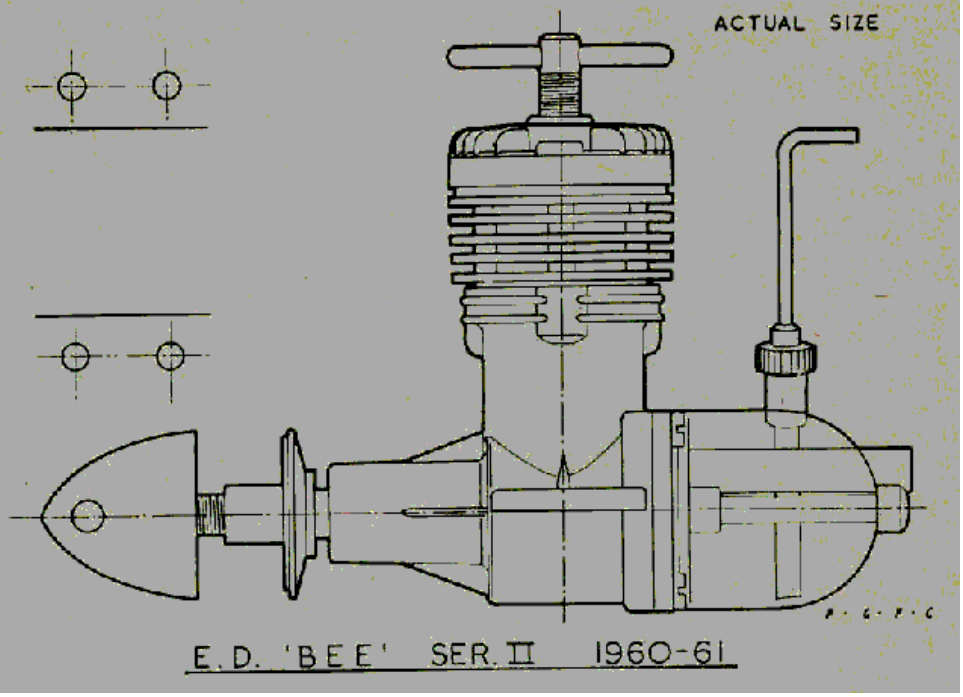
Test Engine Data

Running time prior to test: 2 hours.
Fuel used: E.D. Economic.

Performance

Initial tests of our particular Bee revealed that, with the needle-valve in

Continued on page 60



E. D. BEE

Engine Test

Continued from page 42

the fully closed position, fuel was still reaching the intake in sufficient quantity to keep the engine going. This was found to be due to the threaded thimble having been brazed on too far down the needle stem and, since complete control over mixture strength is obviously desirable for test purposes, the needle was replaced with that from our 1956 Bee. With this the normal running setting was 2½ turns open.

The high performance of the new Bee has already been mentioned. On our example this was at the cost of some deterioration in case of starting. This was noticeable only because the Bee has always been noted for its extremely good starting qualities. The engine now seems to prefer port priming for a start from cold and cold starting was better on large props than on small ones. This also applied when the engine had been allowed to cool down for several minutes after a run. If refuelled and restarted immediately after a run, however, starting was virtually instantaneous following one preliminary choked flick of the prop.

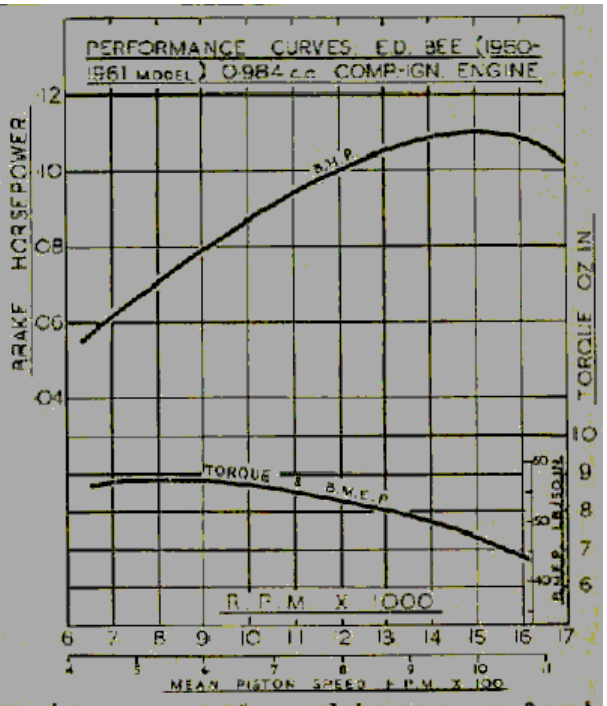
The improved performance of the new Bee was evident even at quite moderate speeds. Torque was up by 30 per cent. at 8,000 r.p.m. and by 60 per cent. at 12,000 r.p.m. Brake horsepower peaking speed was up by no less than 4,500 r.p.m. or more than 40 per cent. and the sum total of these improvements was to raise the output to just on 0.11 b.h.p. at a shade over 15,000 r.p.m.—an increase of nearly 72 per cent.

To make full use of this performance, a 7 × 3 prop would seem to be the best size for F/F or a 7 × 4 for C/L. For normal (non-contest model) use, however, these sizes can be comfortably increased to 8 × 4 and 7 × 6.

Thanks to this greatly increased top end performance the scope of the Bee is appreciably widened. The modeller who is ready to move out of the beginner class will find this latest Bee well able to cope with the power requirements of a much larger range of mode designs.

Power/Weight Ratio (as tested): 0.5 b.h.p./lb.

Specific Output (as tested): 1 b.h.p./litre.



WANTED BY THE POLICE

A reward is offered for information leading to the arrest of Eddy Current, charged with the induction of an 18 year old coil called Milli Henry found half-choked, and robbed of valuable joules. The unrectified criminal, armed with a carbon rod, escaped from Western Primary Cell, where he had been dropped in ions. The escape was planned in three phases. First he refused the electrolytes, then he climbed through a grid despite the impedance of wardens, and finally went to earth in a magnetic field. He has been missing since Faraday. What seems most likely is that he stole an A.C. motor. This is of low capacity and he is expected to try and change it for a megacycle, and to return ohm by a short circuit. He may offer series resistance, and he is a potential killer.

Signed Lt-Col. Coupling.

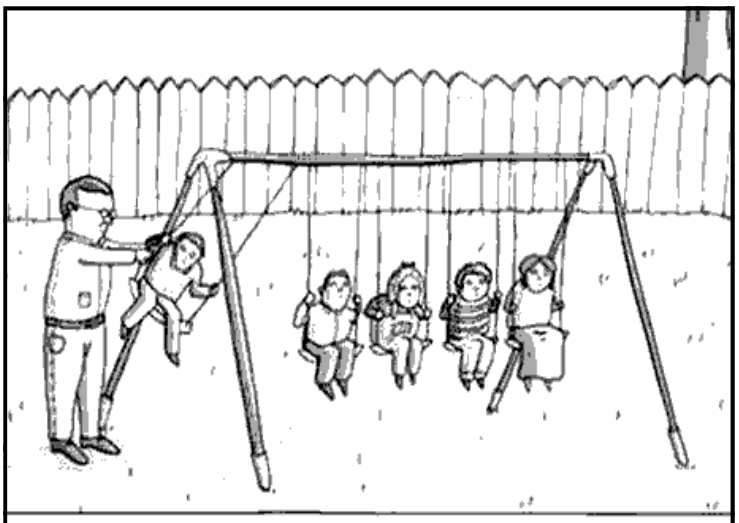
What's the answer?

That power model of Henry's was a potential contest winner—if only it wasn't so darn sensitive to sidethrust or rudder tab setting. You had only to breathe on the tab to change a left hand turn into a screaming right hand spiral dive.

Actually, that's an exaggeration. But the rudder tab was too sensitive for safe adjustment of the power-on circle. Henry got around that problem very neatly in the end. Have you any idea how?

What would YOU do in a case like this? Think a moment, then twist the page for one solution printed below:—

THE ANSWER? . . . Henry adjusted the power-on turn of his model by using propellers of different pitches until he got the correct circling turn. A high pitch prop tends to make a power model fly straight or to the left. A fine pitch prop tends to produce a right hand turn. Somewhere between the two limits was the pitch Henry wanted.



Why science teachers should not be given playground duty.

From Phil Stevenson philstevo2003@yahoo.com.au

Re photo of Harold Stevenson in Sam 600 newsletter #148.

Dad looks so young, aged 27, two years before I was born. The model is a Debbie, I still have a replica he built in the 1980s. The motor would have been a spark 23, probably one he built from Bill Marden castings or one he designed himself similar in appearance to an Olsen. I still have both motors and several others he built, all destined for a museum one day.

I did not know he took the Debbie to Bankstown. He only ever talked about flying it at his parents Berry farm and one flight at Kogarah golf course when it ended up in Kogarah Bay. It lasted until about 1960 when he installed a 29 and single channel RC. I saw it crash probably due to excess weight.

He flew CL speed at the Bankstown Nationals, B and C class, I think he won one and was beaten by Bill Marden in the other. I have a 60 sized speed model with motor which I think was the model used.

Thanks for publishing the photo, brings back great memories.
Phil Stevenson

harold stevenson with power model '48 nats

TRIVIA

As Part Of Its Mosquito Fighting Arsenal, Disney World Uses Which Of These Domestic Animals?

Cats	Emus
Goats	Chickens

Answer →

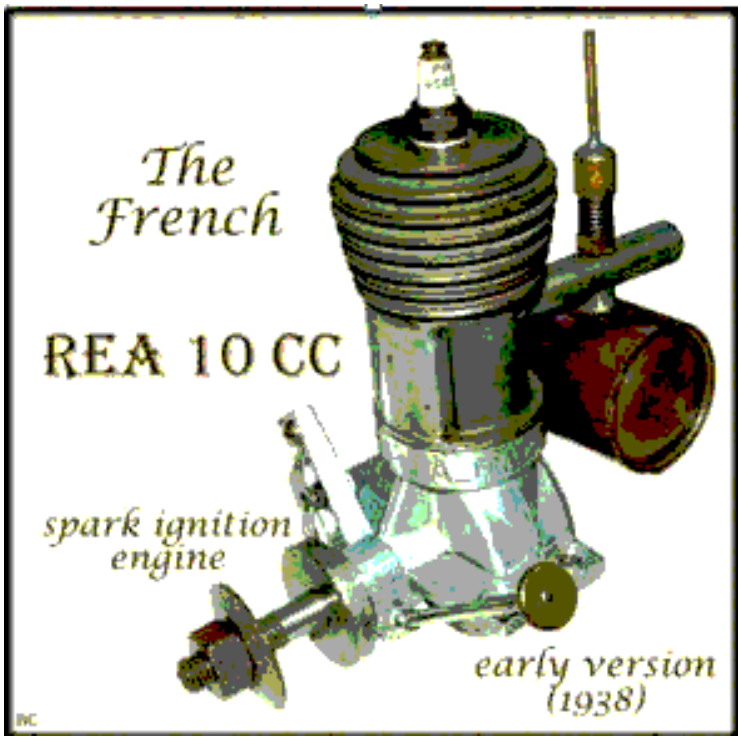
Answer: Chickens

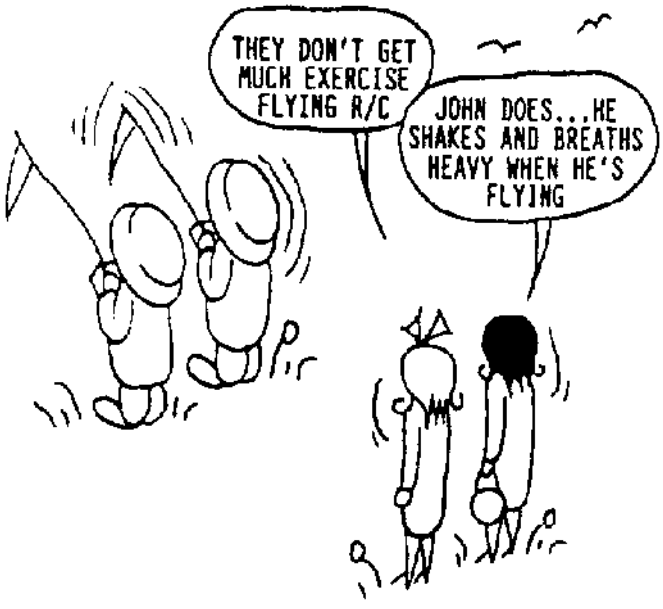
Disney World is located in central Florida which, for the unfamiliar, is a very hot, very humid, and very mosquito-friendly place. In order to make Disney World a more pleasant and safe experience for park visitors, Disney goes to great lengths to minimize the mosquito population.

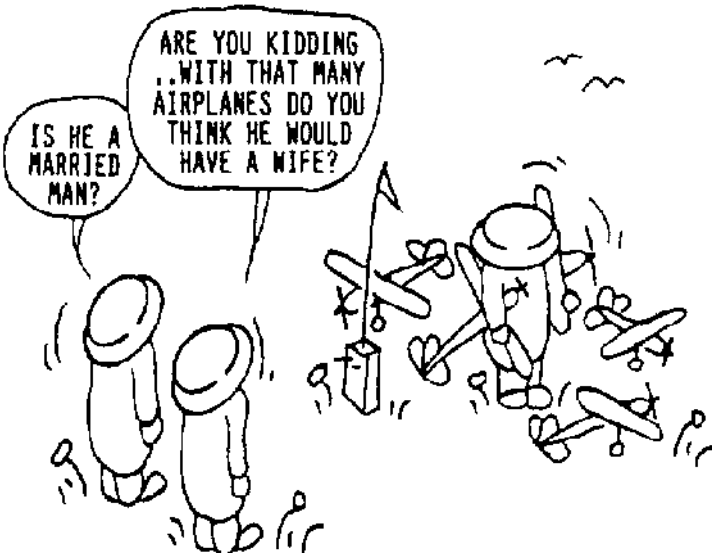
Many of the techniques they use are rather conventional, albeit more precisely and consistently organized than in other places. They spray for mosquitoes, they minimize places where water pools can stagnate, and they keep the natural and man-made bodies of water on the park grounds healthy so that there is a natural balance (and plenty of fish and frogs to eat up the mosquito larva).

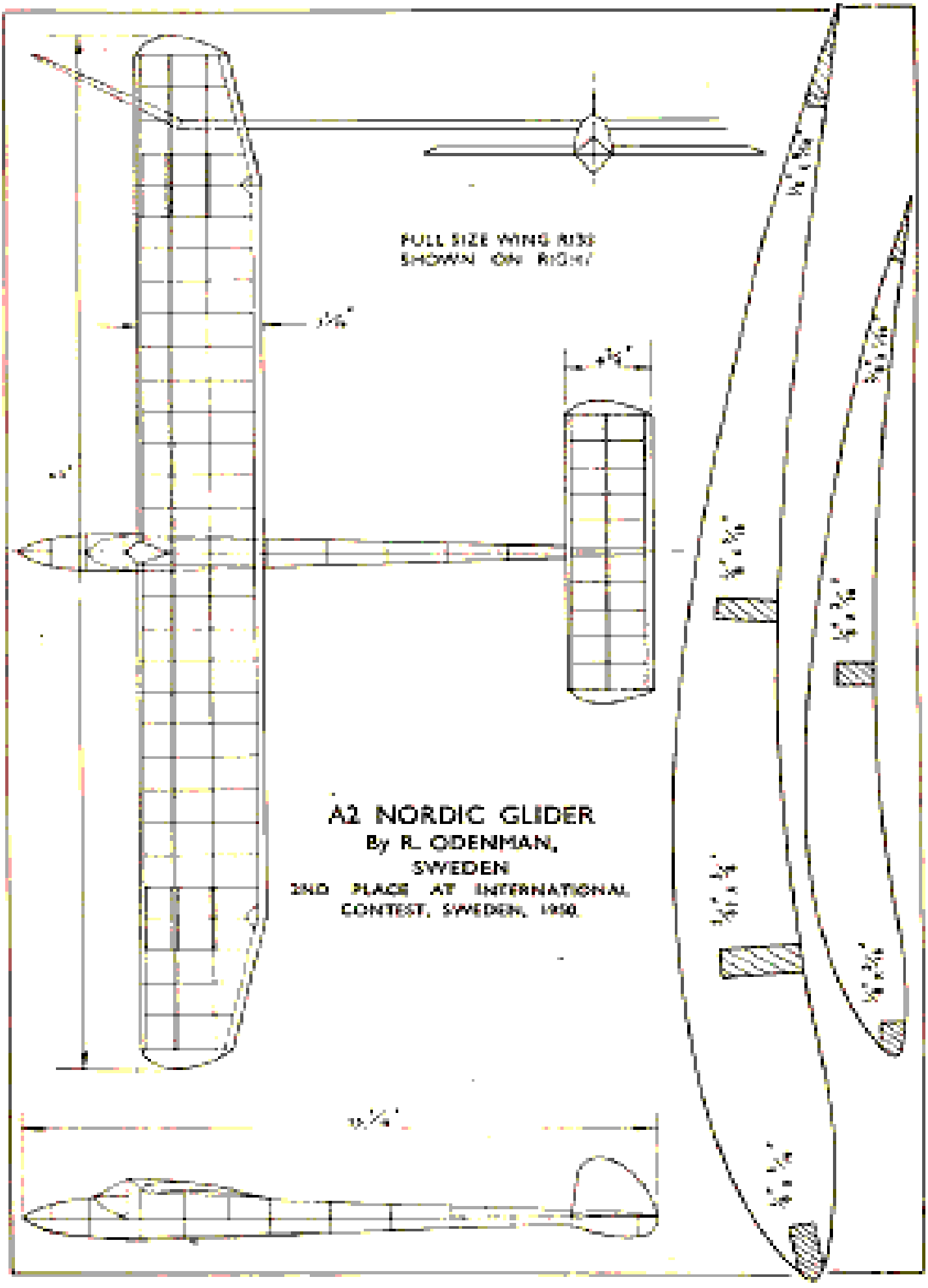
Beyond that though, they take measures that your local parks department definitely isn't using. They maintain active carbon-dioxide traps around the park system to monitor mosquitoes in order to gauge their numbers, which species they are, and which part of their life cycle the majority of bugs in the park are currently in. Further, and definitely most interestingly, they also keep a small army of chickens hidden in coops throughout the park system.

Why chickens? It's not because the chickens eat the mosquitoes, but because the chickens will register antibodies for human diseases carried by the mosquitoes without getting sick from the diseases themselves. Disney employees consistently take blood samples from the chickens to pinpoint when and where any disease vectors crop up and then increase their mosquito fighting measures accordingly to ensure that nobody's trip to the Magic Kingdom ends up with a not so magical trip to the hospital. *Image courtesy of Disney.*

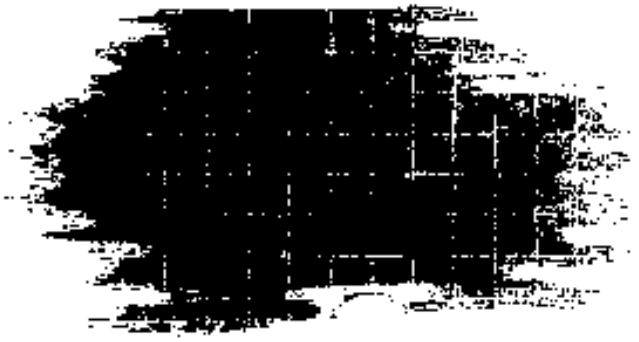




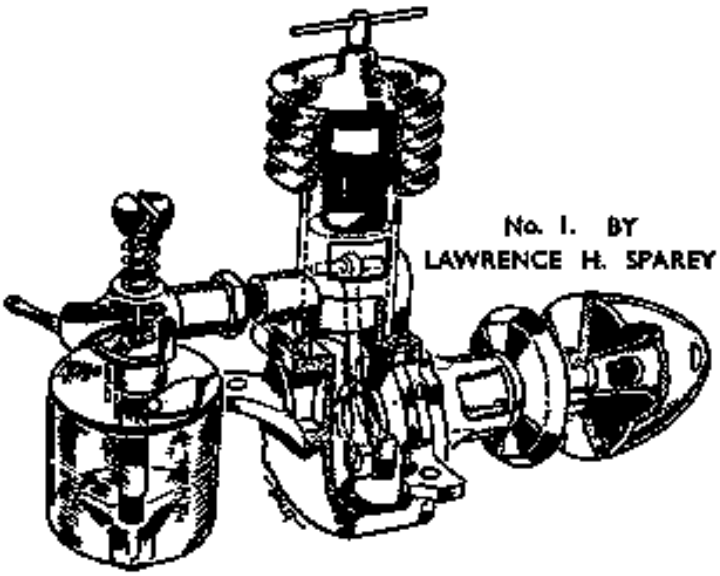




From 1950 Aeromodeller Annual



AS this is the first of a new series, a few words of introduction would not be out of place. It is our intention to deal in turn with each and every British engine, both petrol and diesel, that is on the market, giving the fullest possible information available. General information is being supplied by the manufacturers and the actual testing carried out by our well-known staff contributor, L. H. Sparey, whose experience of miniature motors and model engineering numbers twenty years or so. In addition to accurate three-view drawings, cut-away perspectives, and performance graphs, details of a specially designed AEROMODELLER airscrew will be given for each engine. These airscrews are being designed by P. R. Payne, better known as John, Halifax, another well-known contributor of ours, who is working in close co-operation with Mr. Sparey in this respect. Every engine that appears in this series will have been tested on the same equipment thus ensuring comparative results and we would emphasize that considerable care and thought has gone into the test equipment used in order to maintain the highest possible accuracy.



No. 1. BY LAWRENCE H. SPAREY

TEST

Fuel. Recommended fuel was used.

Starting. Hand starting was used throughout. Once the correct settings have been found the engine starts fairly easily from cold. Rather difficult to start when hot, as controls must be readjusted to find correct setting for restart. The cut-out for stopping is very effective.

Running. Runs well and steadily when using recommended propeller, or when load is matched to output. Outside a speed range of 5 to 7,000 r.p.m. engine "hunts," and it is almost impossible to maintain a steady speed. This complicated the tests considerably.

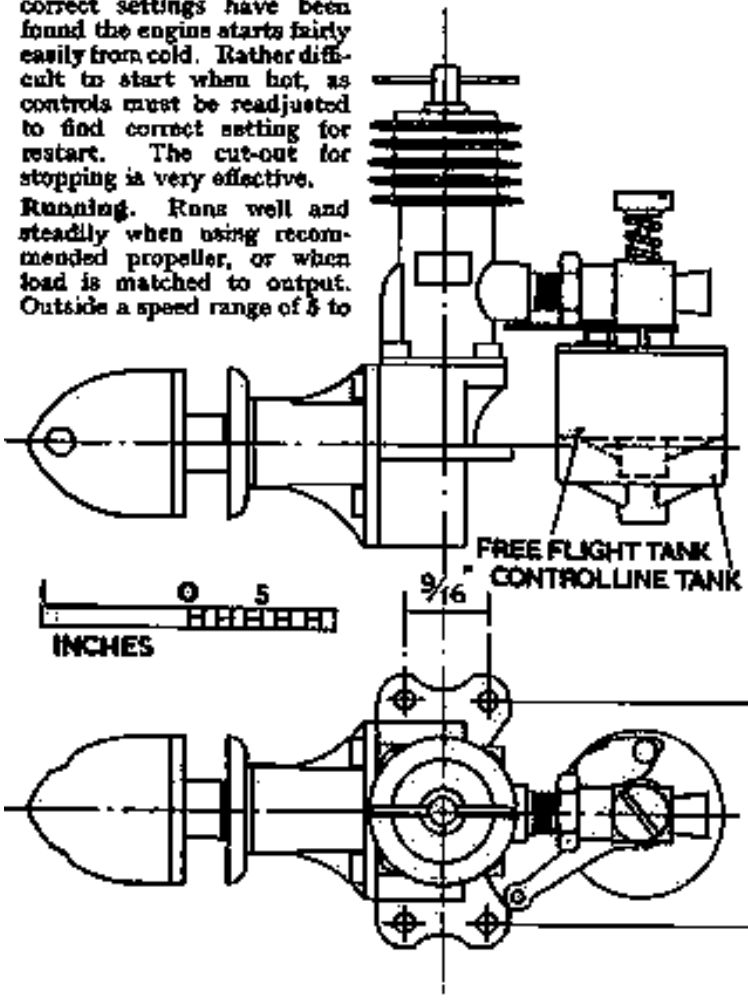
B.H.P. As may be seen from the graph, power rises steeply with revs. between 5 and 6,000 r.p.m., after which a gradual flattening takes place culminating in maximum B.H.P. output at 7,000 r.p.m. The considerable figure of ·109 b.h.p. is achieved, which is extremely good for a 2 c.c. engine, and compares well with the few published figures for b.h.p. available for small diesels, which are, in our experience, usually exaggerated. Above 7,000 r.p.m. power falls off to ·08 b.h.p. at 10,000 r.p.m. This was the maximum speed at which engine was tested.

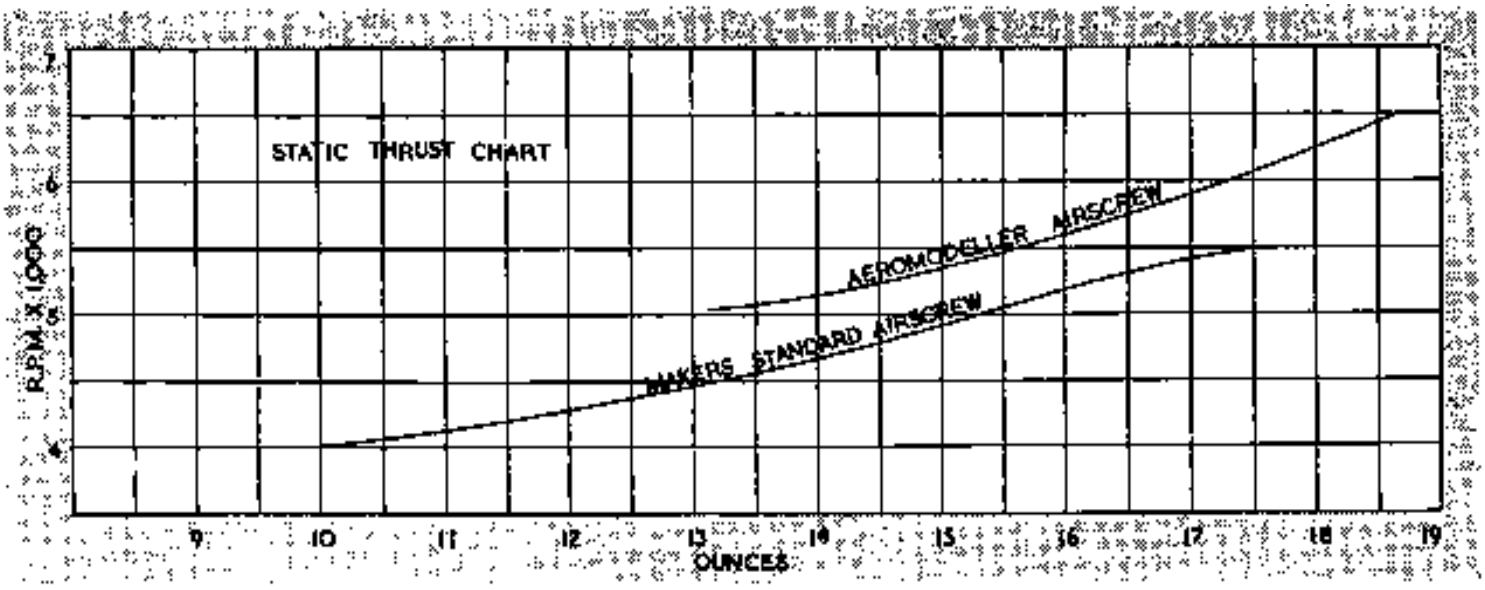
Static Thrust. The graph shows that using the maker's standard propeller, a maximum thrust of 17·8 ozs. was developed at 5,500 r.p.m. The particular engine tested would not run at higher speed with this load. It will be noted that static thrust falls quickly as r.p.m. decrease.

Tests were also made with an AEROMODELLER propeller specially designed for this engine. Maximum revs. attainable with this airscrew were 6,500, which reaches very nearly the maximum b.h.p. revs. Static thrust developed at this point is 18·7 ozs. It was not found possible to run the engine consistently at a speed below 5,000 r.p.m. with the AEROMODELLER propeller.

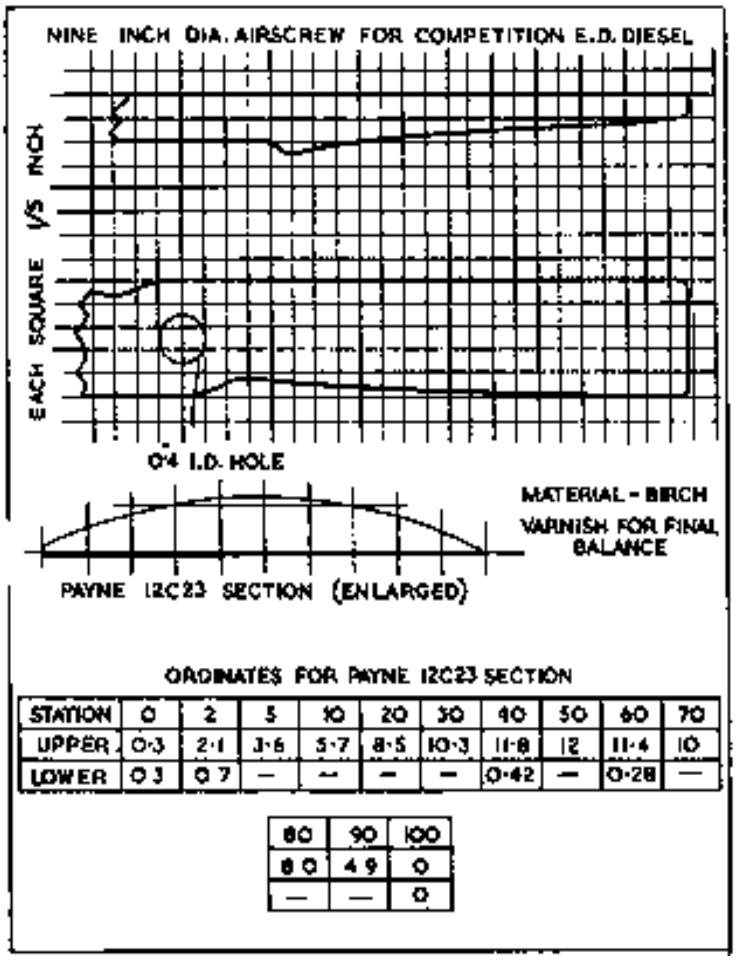
GENERAL AND CONSTRUCTIONAL DATA

Name. E.D. Competition Special.
Manufacturers' Name and Address. Electronic Developments (Surrey) Ltd., 18, Villiers Road, Kingston-on-Thames, Surrey. Tel.: Kingston 1223.
Retail Price. £4. 17s. 6d.
Delivery. 7 days.
Spares Service. Complete spares service direct from factory with 14 days delivery.
Type. Compression Ignition "Diesel."
Specified Fuel. 1 part Ether Meth: 1 part Castor Oil: 1 part Paraffin Oil (Burning).
Capacity. 2 cubic centimetres: ·122 cubic inches.
Weight. Bare 6 ozs. With 11 in. prop. 6¼ ozs.
Compression Ratio. 16-1.





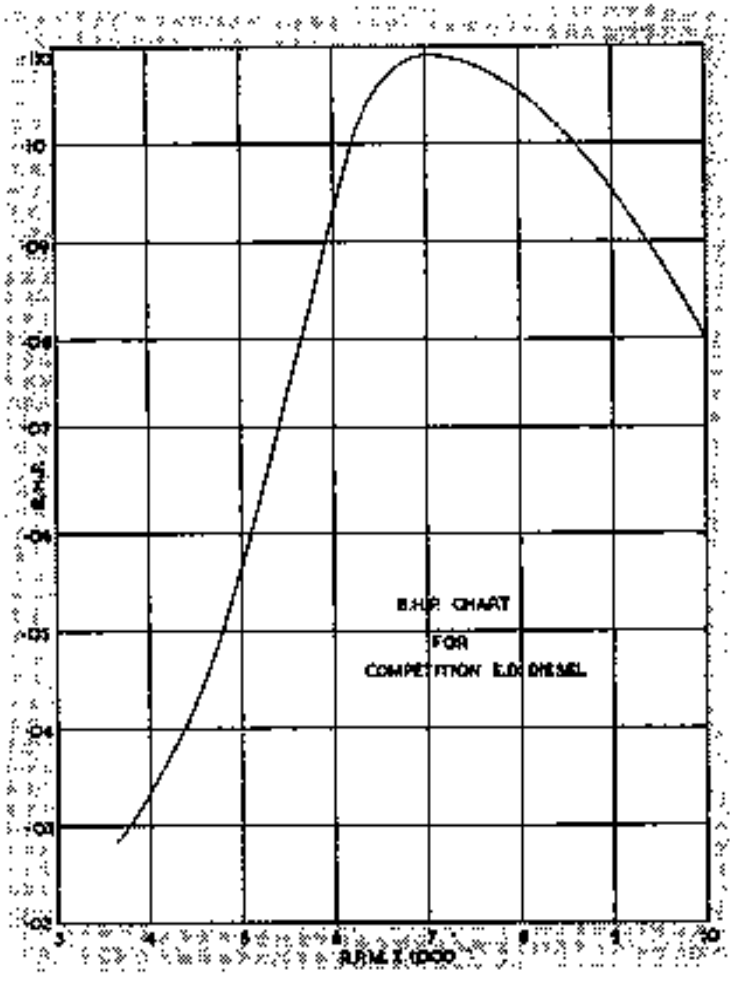
Mounting. Beam. Uprights, or inverted.
Recommended Airscrew. Free flight 11 in. dia. 5 in. pitch. Control line 9 in. dia. 11 in. pitch.
Recommended Flywheel. 2 in. dia., weight 4½ ozs. Obtainable from manufacturers price 10s. 6d. with washer and Simmonds nut.
Tank. Plastic, capacity, 4 to 4½ minutes running time.
Bore. ½ in. **Stroke.** ½ in.
Cylinder. Hardened steel, ground and honed to accuracy of 0·0001 in. Ports: 2 exhausts, 1 induction, 2 transfer. The induction and transfer ports are soft soldered to the cylinder.
Cylinder Head. Duralumin with 5 cooling fins. Screwed on to cylinder with clearance for contra piston.
Contra Piston. Hardened steel, ground and honed to 0·0001 in. limits, adjusted by means of a Vernier Compression Screw.
Crankcase. L.33 alloy. Pressure die-cast and webbed to give maximum strength.
Piston. Cast iron, ground and honed to 0·0001 in. accuracy. Deflector milled to coincide with transfer port. No rings.
Connecting Rod. Hardened steel, bored and ground to 0·0001 in. limits.
Crankpin Bearing. Plain bearing machined from solid integral with crankshaft.
Crankshaft. Machined from S.14 hardened and ground to 0·0001 in. limits.
Main Bearing. Bearing housing made from L.33 material, pressure diecast, and bushed at each end with cast iron bushes, leaving 1/32 in. clearance between bushes. The bushes are ground to 0·0002 in. limits.
Special Features. Built in cut-out: Vernier compression adjustment: Specialised timing giving maximum possible power: Easily converted for inverted running by slackening carburettor locknut and reversing complete carburettor unit: Runs in either direction without affecting efficiency.

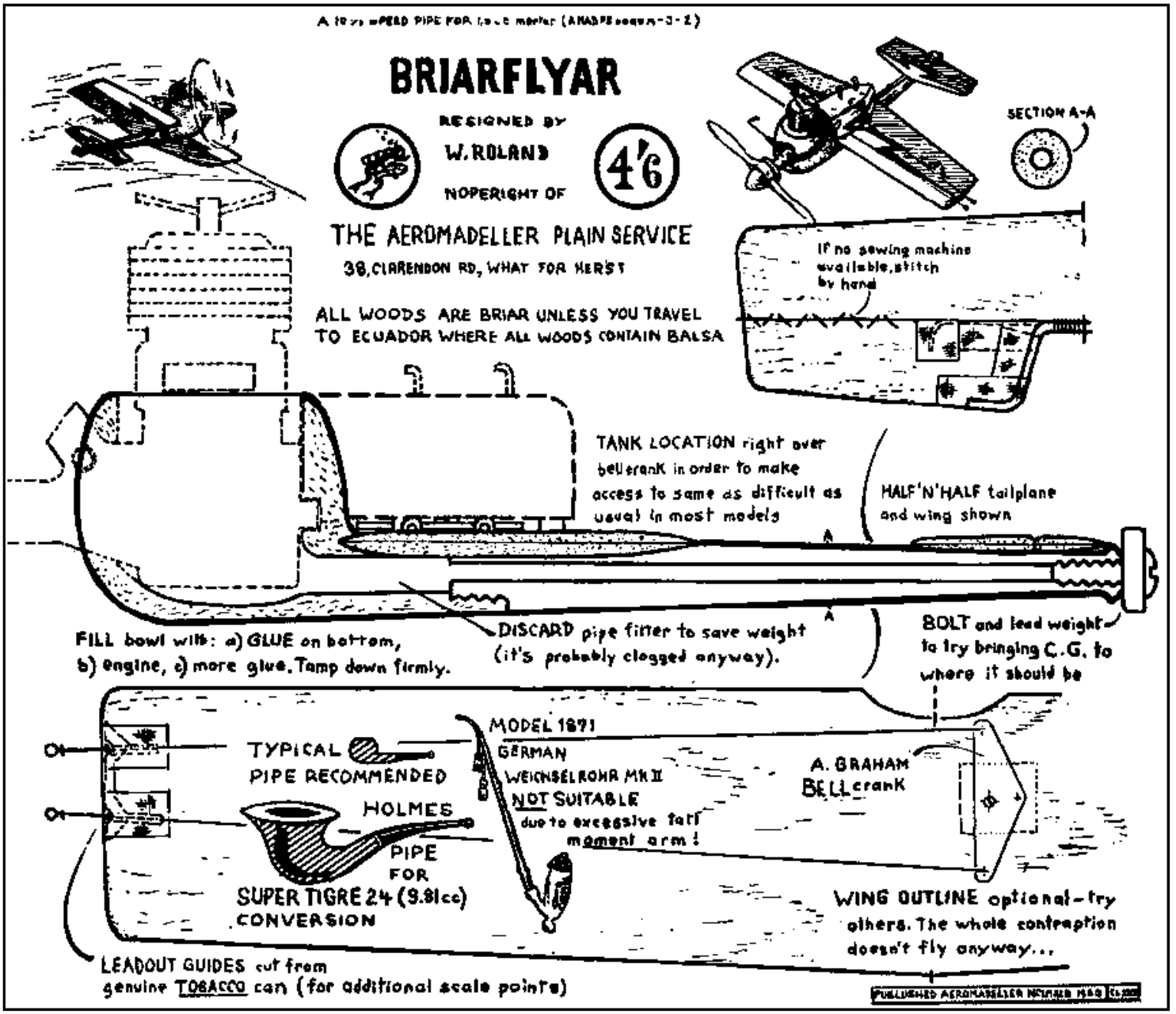


ORDINATES FOR PAYNE 12C23 SECTION

STATION	0	2	5	10	20	30	40	50	60	70
UPPER	0·3	2·1	3·6	5·7	8·5	10·3	11·8	12	11·4	10
LOWER	0 3	0 7	—	—	—	—	0·42	—	0·28	—

80	90	100
8 0	4 9	0
—	—	0





Miss SAM CHAMPS

LAST MINUTE FLASH

Just received a letter from Tricia Webster, our Miss SAM CHAMPS 1977 with the photos, above. Tricia says she's 20 and a Junior at the University of Tennessee in Knoxville, home of the Vols big orange and now, Johnny Majors. She's a Public Relations major, enjoys disco dancing, tennis, dating fraternity guys and attending model airplane contests. Tricia says that at the Old Timer contests she usually "pits for her dad where her job is holding his tail – the airplane's tail, that is . . . because sometimes it gets away from him, and hacks at his fingers with its prop!" Tricia asked us if we wanted to know if she was glow or ignition. "Since I send off a lot of sparks, I guess I'm ignition!" She can't wait to see us in Las Vegas and is looking forward to the fun!

(Well, that did it . . . I just called for reservations, Al Hellman just made an appointment with his doctor . . . and John Pond still didn't get his specifications . . . Pete)

Contest Calendar 2019

SAM 600 Australia
Victorian Old Timers Association Inc.
10 Cunningham Drive
Endeavour Hills
Vic 3802

Contests commence at 9 am, unless otherwise stated.

The 2017 MAAA Rules apply

Climb & Glide in brackets will be flown only if time permits

The CD for all SAM600 events will be nominated on the day of the event

General Meeting Echuca 8.30am March 17th / AGM Echuca 8.30am September 22nd

All 1/2A, Duration &Texaco events will have the electric equivalent (except State Champs & Nats)

September 21st-22nd	**ECHUCA** **Saturday:** 1/2A Texaco, Duration, Burford **Sunday:** 8.30 am AGM meeting, Texaco, '38 Antique, (Climb & Glide)
November 9th & 10th	**COHUNA** **Saturday:** 1/2A Texaco, Duration, Burford **Sunday:** Texaco, 38 Antique { Climb & Glide }
November 24th	**BALLARAT** 1/2A Texaco, Climb & Glide, Texaco