The Thermaleer

SAM 600 of Australia Newsletter Issue No.143 October-December 2017

1st Place winners of Texaco at Cohuna in November = all six of them - L to R Steve Gullock, Lyn Clifford, Don Grant, Graeme Gulbin, Robert Taylor, Steve Jenkinson.

NEXT COMPETITONS

January 27th & 28th 2018	**P & DARCS CARDINIA 10 am Start** *Saturday:* Classic Aerobatics, Vintage Gliders, Fun Fly *Sunday:* Roy Robinson Trophy Texaco, Duration, --- Mass launch foam gliders
March 17th & 18th 2018	**ECHUCA** *Saturday:* 1/2A Texaco, Duration, Burford *Sunday:* 8.30am General meeting, Texaco, '38 Antique (Climb & Glide)
March 29th-April 2nd Easter 2018	**CANOWINDRA - SAM Champs Down Under** SAM 1788 Competition

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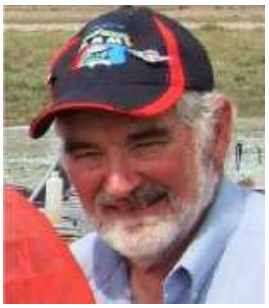

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"The Thermaleer" is the official newsletter of SAM 600 of Australia, Victorian R/C Old Timers Association (SAM600) Inc.

The Night Before Christmas Aviation Style

T'was the night before Christmas, and out on the ramp,
Not an airplane was stirring, not even a Champ.
The aircraft were fastened to tie downs with care,
In hopes that -- come morning -- they all would be there.

The fuel trucks were nestled, all snug in their spots,
With gusts from two-forty at 39 knots.
I slumped at the fuel desk, now finally caught up,
And settled down comfortably, resting my butt.

When the radio lit up with noise and with chatter,
I turned up the scanner to see what was the matter.
A voice clearly heard over static and snow,
Called for clearance to land at the airport below.

He barked his transmission so lively and quick,
I'd have sworn that the call sign he used was "St. Nick."
I ran to the panel to turn up the lights,
The better to welcome this magical flight.

He called his position, no room for denial,
"St. Nicholas One, turnin' left onto final."
And what to my wondering eyes should appear,
But a Rutan-built sleigh, with eight Rotax Reindeer!

With vectors to final, down the glideslope he came,
As he passed all fixes, he called them by name:
"Now Ringo! Now Tolga! Now Trini and Bacun!
On Comet! On Cupid!" What pills was he takin'?

While controllers were sittin', and scratchin' their heads,
They phoned to my office, and I heard it with dread,
The message they left was both urgent and dour:
"When Santa pulls in, have him please call the tower."

He landed like silk, with the sled runners sparking,
Then I heard, "Left at Charlie," and "Taxi to parking."
He slowed to a taxi, turned off of three-oh,
And stopped on the ramp with a "Ho, ho-ho-ho..."

He stepped out of the sleigh, but before he could talk,
I ran out to meet him with my best set of chocks.
His red helmet and goggles were covered with frost,
And his beard was all blackened from Reindeer exhaust.

His breath smelled like peppermint, gone slightly stale,
And he puffed on a pipe, but he didn't inhale.
His cheeks were all rosy and jiggled like jelly,
His boots were as black as a cropduster's belly.

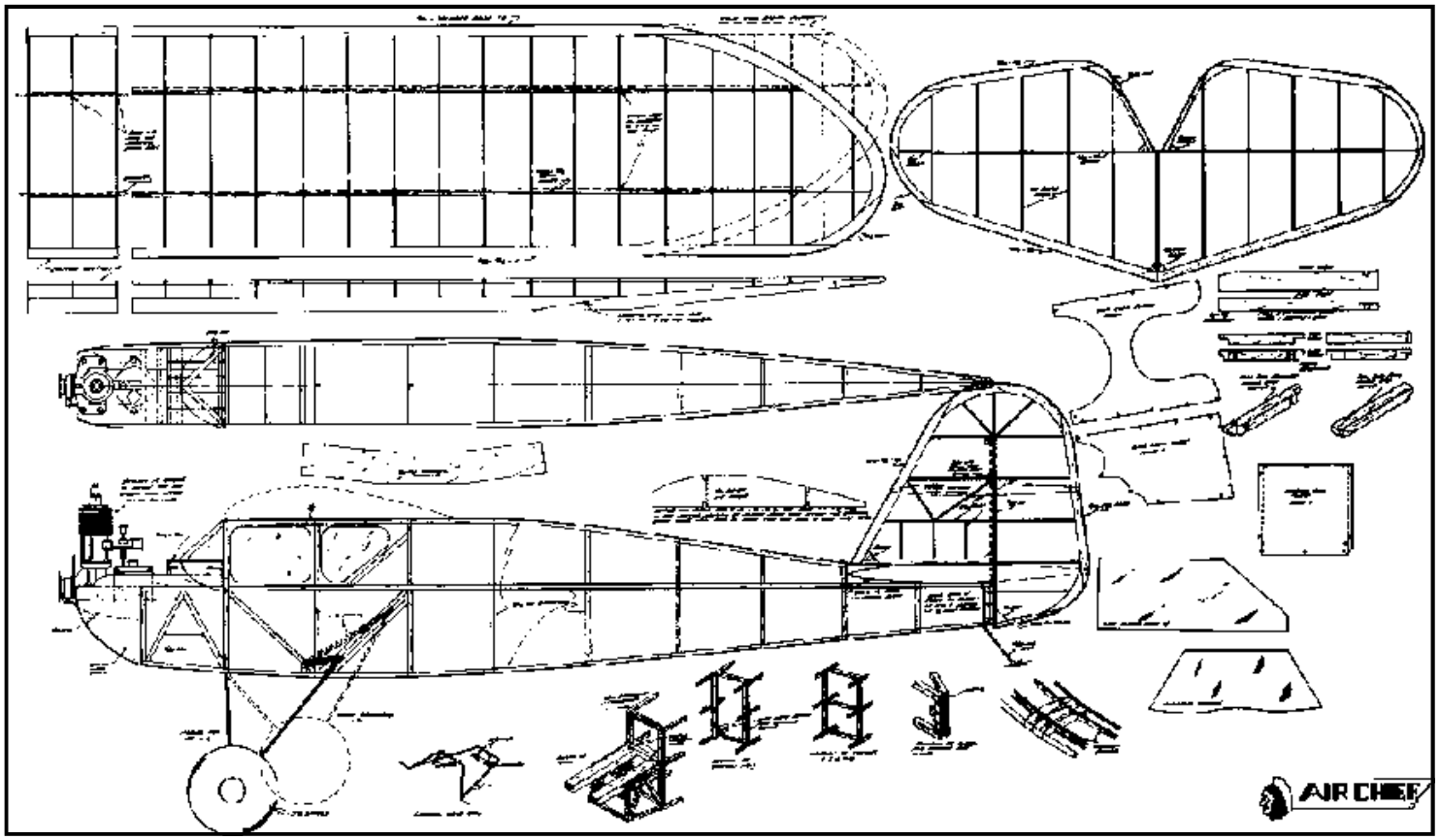
He was chubby and plump, in his suit of bright red,
And he asked me to "fill it, with hundred low-lead."
He came dashing in from the snow-covered pump,
I knew he was anxious for drainin' the sump.

I spoke not a word, but went straight to my work,
And I filled up the sleigh, but I spilled like a jerk.
He came out of the restroom, and sighed in relief,
Then he picked up a phone for a Flight Service brief.

And I thought as he silently scribed in his log,
These reindeer could land in an eighth-mile fog.
He completed his pre-flight, from the front to the rear,
Then he put on his headset, and I heard him yell, "Clear!"

And laying a finger on his push-to-talk,
He called up the tower for clearance and squawk.
"Take taxiway Charlie, the southbound direction,
Turn right three-two-zero at pilot's discretion"

He sped down the runway, the best of the best,
"Your traffic's a Grumman, inbound from the west."
Then I heard him proclaim, as he climbed thru the night,
"Merry Christmas to all! I have traffic in sight."



FROM THE PRESIDENT

Kevin Fryer.

After a great weekend at Cohuna the year finished off at Ballarat with a only three events flown before it was agreed to finish up because of the poor weather. However it was good to sit inside and natter with the guys and find out about their exploits with aero-tow gliders and other gliding adventures. It appears it is not good idea to try an aero-tow take off across winch lines!

After the running of the Eastern States Gas Champs at the beginning of October where only three SAM 600 members attended, I had a discussion with Peter Van de Waterbeemd, SAM 1788 President, about the future of running of the Eastern State Gas Champs at Wangaratta. It became obvious that it will need a greater commitment from our members if this event is to continue at Wangaratta due to the cost of using the venue. Peter advised that he will organize the ESGC program for 2018 early and let SAM 600 know the details well in advance of the event.

The boys from *Make-A-Space* are now producing and assembling the first version of a small ½A electric oldtimer style model especially for fathers and sons to construct. The model is all keyed so it clips together and it is very easy for newcomers to build. What we'll endeavor to do first is that the father and son will be taught about laser cutting of models and also about 3D printing. Then at VARMS a night session will be run for the father and son to assemble the model and then slot them into a VARMS Training Program. Assistance will be given in organizing all the necessary equipment including the electric power systems. The aim of all this is to get the newcomers into our clubs. As a rub-off the kids will learn life skills which we hope will help them getting a job or occupation in the future.

I would like to wish all SAM 600 members the compliments of the Season and look forward to a great 2018 season of Oldtimer activities with you. Cheers and safe flying, Kevin Fryer.

CONTEST CO-ORDINATOR'S REPORT

Don Grant

Hello Members, Unfortunately the weather at Ballarat was against us and thanks to those who came and took the chance.

I will be extending the change I made to the way 1/2A is run to the other classes where both electric and I/C are flown as it seemed to save time and there may be other small changes that can be made that will save more time.

In an effort to get through all classes we seemed to be moving to flying 2 out of 3 rounds in all classes and I would like to get back to flying 3 out of 4 rounds weather permitting. The next comp. is the Roy Rob at Cardinia so lets hope for good weather and a great comp.

See you at P&DARCS, Don Grant

"The Stebbings Memorial" Champ of Champs - 2017
Final Results

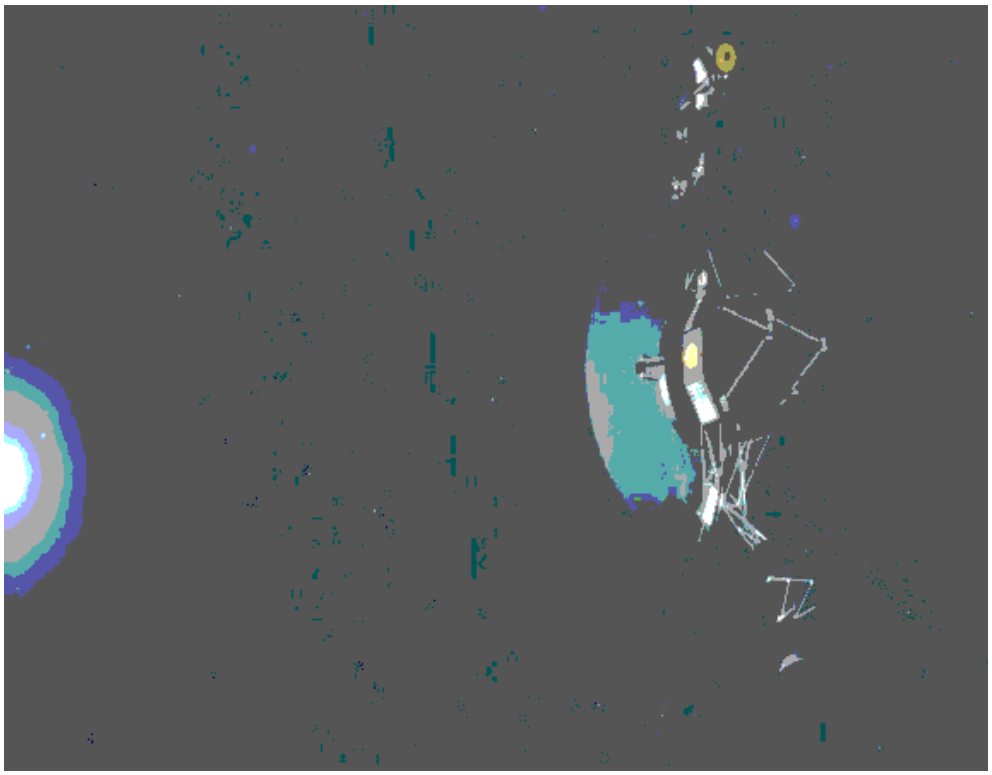
Event	1st Place	2nd Place	3rd Place	Number In Fly Off
ROY ROBINSON 29th January, 2017				
Texaco	Col Collyer	Steve Gullock	Don Grant	5
Duration	Kevin Fryer	Col Collyer	Steve Jenkinson	4
Electric Texaco	Gavin Dunn			1
Electric Duration	Gavin Dunn	Bob Wilson		2
ECHUCA 25th-26th March, 2017				
Texaco	Kevin Fryer	Lyn Clifford	Steve Gullock	6
Electric Texaco	Steve Gullock	Roger Mitchell	Laurie Baldwin	2
Duration	Col Collyer	Lyn Clifford	Don Grant	4
Electric Duration	Kevin Fryer	Roger Mitchell	Laurie Baldwin	3
½A Texaco	Robert Taylor	Kevin Fryer	Don Grant	4
Elec ½A Texaco	Steve Jenkinson	Col Collyer	Laurie Baldwin	8
Burford Event	Kevin Fryer	Steve Jenkinson	Lyn Clifford	3
'38 Antique	Kevin Fryer	Col Collyer	Don Grant	5
VIC/SA State Champs 6th-7th May, 2017				
1/2A Texaco	Kevin Fryer	Don Grant	Lyn Clifford	4
Elec ½ A	Steve Jenkinson	Gavin Dunn	Laurie Baldwin	7
Burford	Steve Jenkinson	Steve Gullock	Lyn Clifford	3
Duration	Don Grant	Lyn Clifford	Brian Laughton	6
Elec Duration	Kevin Fryer	Laurie Baldwin	Gavin Dunn	2
Texaco	Don Grant	Steve Sinclair	Graeme Gulbin	8
Elec Texaco	Roger Mitchell	Laurie Baldwin	Graeme Dunn	3
'38 Antique	Don Grant	Steve Gullock	Robert Taylor	3
BALLARAT 21st-22nd May, 2017 - CANCELLED due to weather.				
ECHUCA 9th-10th September.2017				
1/2A Texaco	Kevin Fryer	Robert Taylor	Lyn Clifford	4
Elec 1/2A	Kevin Fryer	Gavin Dunn	Max Heap	7
Duration	Pat Keely	Don Grant	Kevin Fryer	3
Elec Duration	Gavin Dunn	Kevin Fryer	Lyn Clifford	3
Burford	Kevin Fryer	Don Grant	Steve Gullock	4
Texaco	Don Grant	Steve Gullock	Graeme Gulbin	5
Elec Texaco	Gavin Dunn	Steve Gullock	Don Grant	4
'38 Antique	Lyn Clifford	Steve Gullock	Don Grant	4

FINAL POINTS I/C		
Kevin Fryer	48	1st
Don Grant	47	2nd
Lyn Clifford	36	3rd
Steve Gullock	28	4th
Robert Taylor	22	5th
Steve Jenkinson	17	6th
Col Colyer	15	7th
Graeme Gulbin	9	8th
Pat Keely	7	9th
Brian Laughton	8	10th
Stuart Sinclair	4	11th
Brian Dowie	2	12th
Robin Yates	1	13th
Max Heap	1	13th

FINAL POINTS ELECTRIC		
Gavin Dunn	35	1st
Kevin Fryer	25	2nd
Roger Mitchell	17	3rd
Steve Gullock	15	4th
Laurie Baldwin	14	5th
Steve Jenkinson	13	6th
Max Heap	10	7th
Lyn Clifford	8	8th
Graeme Gulbin	8	8th
Col Colyer	6	10th
Bob Wilson	3	11th
Peter Miller	2	12th
Brian Laughton	2	12th

"The Stebbings Memorial" Champ of Champs - 2017 Final Results - continued

Event	1st Place	2nd Place	3rd Place	Number In Fly Off
COHUNA 11th-12th November, 2017				
½A Texaco	Lyn Clifford	Kevin Fryer	Robert Taylor	4
Electric ½A Texaco	Gavin Dunn	Max Heap	Steve Gullock	9
Duration	Kevin Fryer	Brendon Taylor	Steve Gullock	3
Electric Duration	Kevin Fryer	Lyn Clifford	Gavin Dunn	-
Texaco	Don Grant	-	-	8
"	Lyn Clifford	-	-	8
"	Graeme Gulbin	-	-	8
"	Robert Taylor	-	-	8
"	Steve Jenkinson	-	-	8
"	Steve Gullock	-	-	8
Electric Texaco	Max Heap	Roger Mitchell	Gavin Dunn	4
Burford Event	Don Grant	Steve Gullock	Lyn Clifford	2
BALLARAT 26th November, 2017				
½A Texaco	Brian Laughton	Lyn Clifford	Kevin Fryer	3
Electric ½A Texaco	Graeme Gulbin	Kevin Fryer	Gavin Dunn	6
Climb and Glide	Gavin Dunn	Kevin Fryer	Dave Missen	
Remaining events abandoned due to severe electrical storms.				



The Voyager team is able to use a set of four backup thrusters, dormant since 1980. They are located on the back side of the spacecraft in this orientation.

After 37 years, Voyager 1 has fired up its trajectory thrusters.

This week, the scientists and engineers on the Voyager team did something very special.

At present, the Voyager 1 spacecraft is 21 billion kilometres from Earth, or about 141 times the distance between the Earth and Sun. It has, in fact, moved beyond our Solar System into interstellar space. However, we can still communicate with Voyager across that distance.

This week, the scientists and engineers on the Voyager team did something very special. They commanded the spacecraft to fire a set of four trajectory thrusters for the first time in 37 years to determine their ability to orient the spacecraft using 10-millisecond pulses.

After sending the commands on Tuesday, it took 19 hours and 35 minutes for the signal to reach Voyager. Then, the Earth-bound spacecraft team had to wait another 19 hours and 35 minutes to see if the spacecraft responded. *It did.* After nearly four decades of dormancy, the Aerojet Rocketdyne manufactured thrusters fired perfectly.

"The Voyager team got more excited each time with each milestone in the thruster test. The mood was one of relief, joy, and incredulity after witnessing these well-rested thrusters pick up the baton as if no time had passed at all," said Todd Barber, a propulsion engineer at the Jet Propulsion Laboratory in California.

In recent decades, Voyager had been relying on its primary thrusters to keep the spacecraft properly oriented so that it can maintain a communications link with Earth. But these attitude control thrusters have been degrading over time, requiring more and more energy each time they've been used.

By switching to the spacecraft's "trajectory correction manoeuvre" thrusters, last used during the spacecraft's encounter with Saturn in 1980, engineers say they will be able to extend the lifetime of Voyager by two or three more years before its waning power reserves expire.

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The "Nats" as they were "back in the day".

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COHUNA OLDTIMER WEEKEND - November 11th and 12th. 2017.

Report from Brian Dowie Photos from Graeme Gulbin.

A few keen contestants arrived on Friday to try and steal a march on other competitors.

My weekend started well when Kevin Fryer test flew my Playboy Duration Model and took off with too much up elevator, or was it battery failure, either way the Playboy was scraped up and put in a bag.

SATURDAY

The day dawned and all signs were for a glorious day, and it did not disappoint.

Half A IC and Electric Texaco.

There were seven in IC and nine in Electric and as a few were flying both it was decided to run them separately.

The lift was benign and the Electric guys had little trouble, all getting maxes straight off. Always the exception Steve Gullock had to take three flights to achieve his required two. The Fly-Off went and all achieved good flights with Gavin Dunn coming first; Max Heap second and Steve Gullock third. Robin Yates and Graeme Gulbin could not find the landing area and Brian Laughton started having radio problems which forced him to pack up to safeguard his models.

The real modellers went next and even though most achieved the maxes in the heats the lift had gone when it was time for the Fly-Off. Lyn Clifford was able to keep it up long enough to take first place, followed by Kevin Fryer and Rob Taylor.

We adjourned for lunch and partook of the normal Cohuna Fare.

Duration IC and Electric

In IC we had eight and Electric four to face the starters gun.

Lift had improved from late morning and only three in IC went into the Duration Fly-Off. In the Electric Duration Max Heap did not make it as he experienced the affect of gravity and was out of the event. The rest muddled along and finally saw Kevin Fryer triumph without requiring a Fly-Off with Lyn Clifford and Gavin Dunn filling the minor places.

The IC guys went next and even with reasonable lift only three could get the required number of maxes.

The Fly-Off saw Kevin Fryer taking first (we will have to have a good look at his fuel allotment) with Brendon Taylor coming second with that handsome chap Steve Gullock coming third.

Burford

Five very keen guys fronted in moderate lift and two were able get the required times to force a Fly-Off.

Max Heap once again had trouble finding the landing area, Max, get new glasses or a better GPS.

After the dust settled Don Grant had done enough to take first place with Steve Gullock being the first loser. The second loser was Lyn Clifford.

Steve Jenkinson had an interesting excursion after his second flight when he landed in the Sewer Settling Pond. I am told by good authority that his wife has only just let him in the house.

That was the end of Saturday and despite the heat and shifting lift everyone had a good time.

A group of us retired to Bistro for the evening and reminisced on what we should have done.

SUNDAY

It was again a great day and it was evident that it was going to become warmer than Saturday.

Overnight we lost Kevin Fryer and Brian Laughton. Kevin, can't you arrange your social calendar to cater for the important events. Brian retired gracefully with all his models intact but with a misbehaving tranny.

Texaco IC and Electric

With nine in IC and four in electric and lift in abundance it was going to be a good day.

In IC all reached the Fly-Off and with no one coming down it was agreed call it a draw.

The only two flyers that were not included in this finish were Pat Keely and Brian Dowie.

Pat found the only down draft that was there and Roger Mitchell pushed Brian's model too hard on the take-off and broke the fire wall. Or was that fatigue in the joint.

The four Electric guys all came up with the right numbers in the heats and went into the Fly-Off.

They did not enjoy the lift that was later experienced by the IC guys but still performed admirably.

Max Heap got his compass aligned and took first, with Roger the Dodger and Gavin Dunn bringing up the minor places.

During the lunch break it was decided to call it a day as it was really warming up and fatigue was beginning to set in to the already worn out bodies.

All up a great weekend and the only thing missing was you!!! Brian Dowie.

COHUNA 11th-12th November 2017
Results from the Contest Director for IC Engines

1/2A TEXACO

	Name	Model	Engine	CC/sec	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Lyn Clifford	Stardust	Cox		420	420			479	1319
2	Kevin Fryer	Cumulus	Cox		420	420			321	1161
3	Robert Taylor	Stardust Special	Cox		420	420			69	909
4	Brian Dowie	Bomber	Cox		420	420			L/Out	840
5	Don Grant	Anderson Pylon	Cox		355	420	406			826
6	Pat Keely	Stardust Special	Cox		420	240				660
7	Brian Laughton	Albatross	Cox		420					420

DURATION

	Name	Model	Engine	CC/Sec	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Kevin Fryer	Playboy	McCoy 60	40	420	420			634	1474
2	Brendon Taylor	Cumulus	YS 63	28	420	420			597	1437
3	Steve Gullock	Playboy	OS 52 FS	32	420	420			159	999
4	Lyn Clifford	Cumulus	YS 63	28	339	420	341			761
5	Robert Taylor	Cumulus	YS 63	28	315	420	250			735
6	Steve Jenkinson	RC1	ASP 40	25	241	420	235			661
7	Pat Keely	Lanzo Bomber	OS 56 FS	32						DNF
8	Don Grant	Playboy	YS 63	28						DNF

TEXACO

	Name	Model	Engine	CC/Sec	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Don Grant	Lanzo Bomber	Anderson Spit-fire	24	600	600			3600	4800
1	Lyn Clifford	Lanzo Racer	OS 60 FS	18	600	600			3600	4800
1	Graeme Gulbin	Lanzo Bomber	OS 60 FS	18	600	600			3600	4800
1	Robert Taylor	Cumulus	OS 61 FS	18	600	600			3600	4800
1	Steve Jenkinson	Lanzo Bomber	ASP 52 FS	18	600	600			3600	4800
1	Steve Gullock	Lanzo Bomber	Enya 53 FS	15	600	600			3600	4800
7	Pat Keely	Lanzo Airborne	OS 61 FS	15	600	600			385	1585
8	Brian Dowie	Lanzo Bomber	OS 60 FS	15	L/Out	600	600		0	1200
9	Robin Yates	Lanzo Bomber	OS 48 FS	12	375					375

BURFORD EVENT

	Name	Model	Engine	CC/sec	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Don Grant	Creep	BB	38	300	300			371	971
2	Steve Gullock	Stardust Special	BB	38	300	300			342	942
3	Lyn Clifford	Stardust Special	PB	38	300	279	L/Out			579
4	Steve Jenkinson	Dixielander	BB	38	300	In the Poo				300
5	Max Heap	Dixielander	PB	40	L/Out					0

COHUNA 11th-12th November 2017
Results from the Contest Director for Electric Power

ELECTRIC 1/2A TEXACO

	Name	Model	Engine	Sec/cc	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Gavin Dunn	Stardust Special			600	600			11503	2703
2	Max Heap	Stardust Special			600	600			922	2122
3	Steve Gullock	Little Diamond			600	408	600		895	2095
4	Kevin Fryer	Atomiser			600	600			848	2048
5	Steve Jenkinson	Stardust Special			600	600			744	1944
6	Lyn Clifford	Stardust Special			600	600			645	1845
7	Robin Yeates	Lanzo Bomber			600	600			L/Out	1200
8	Graeme Gulbin	Stardust Special			600	600			L/Out	1200
9	Brian Laughton	Albatross			600				DNF	600

ELECTRIC TEXACO

	Name	Model	Engine	CC/sec	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Max Heap	Lanzo Bomber			600	600			1800	3000
2	Roger Mitchell	Bomber			600	600			1621	2821
3	Gavin Dunn	Lanzo Racer			600	600			1320	2520
4	Steve Gullock	Dallaire			600	600			1086	2286

ELECTRIC DURATION

	Name	Model	Engine	CC/Sec	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Kevin Fryer	Cumulus			420	420				840
2	Lyn Clifford	Lanzo Bomber			420	L/Out				420
3	Gavin Dunn	Hayseed			420	L/Out				420
4	Max Heap	Red Ripper			L/Out					DNF

Top Left: Gavin Dunn 1st Elec ½A Texaco, Above: Max Heap 1st Elec Texaco. Left: Elec Texaco Winners LtoR 3rd Gavin Dunn, 1st Max Heap, 2nd Roger Mitchell. Below: Gavin Dunn;s Hayseed takes-off in Elec Duration and gaining 3rd place.

Above: Setting up for a hot day at Cohuna.

½A Texaco winners L to R: 2nd Kevin Fryer, 1st Lyn Clifford, 3rd Robert Taylor

Above: Kevin Fryer checks some rubber bands for his Electric Duration Cumulus. Left: Pat Keely prepares his Lanzo Bomber for Duration assisted by Ted Arnett.

Above: Ted Arnett releases Steve Gullock's Lanzo Bomber for the Duration Event. Left: Brian Laughton releases Kevin Fryer's Playboy for the Duration Event.

Above: Steve Jenkinson landing his RC1 for 6th place in Duration. Left: Roger Mitchell's electric Lanzo Bomber comes home with 2nd place in Electric Texaco.

Above: Max Heap taking off for the Electic Texaco fly-off at Cohuna and gaining 1st Place.

Right: Robert Taylor receiving 3rd Place trophy in ½A Texaco at Cohuna.

BROOKLYN DODGER SET UP

From Larry Davidson.

The Trim is Right Climb, Right Glide (stab tilt) for glide (Raise right side of stab)
I fly mine with 2 1/4" total decalage W/Robart Incidence Meters.
1 degree left thrust, 1/8" wash-in in the right main at the poly break (important!). This should keep it from rolling in to the right.
A little wash out in both wing tips. (about 1/8")
CG 4 1/4" from the T/E Important!, no further back!
10-5 APC prop. Forget the backwards thing. That doesn't show much.
Set up the Texas Ultimate timer for a quick (2 second delay) DT and 4 second engine run. Point the plane about 80 degrees and slightly to the right of the wind, banked to the right. Engine about 10K for first flights. Use rudder tab sparingly for climb trim. Good luck. Larry.

BALLARAT OLDTIMER - NOVEMBER 26th 2017

Report from Brian Laughton Photos from Graeme Gulbin

The weather forecast was for 80% chance of rain but not too windy, On arriving the sky looked gloomy with a lot of thunder and lightning in the nearby hills.

Then the rain started and we all sheltered in the new kitchen that the Ballarat boys had built and just finished painting. Starting time was put off until 11 o'clock and by this time it had just finished raining but still lots of thunder and lightning but it was decided to go ahead and fly 1/2A Texaco, both I/C and Electric.

Because of the late start it was decided to fly 2 out of 3 rounds to qualify and as there were some competitors flying both disciplines electric was allowed to fly as they wished, the same as I/C, not all electric together as is normally the case. This helped to get both disciplines up to the start of thefly off in 1.1/2 hours. It was a very good idea of yours Don.

Unfortunately Don Grant lost his Anderson Pylon model by not turning on his receiver, showing another model that flies better without a pilot. In I/C I was lucky to catch a little bit of lift and beat Lyn Clifford with Kevin Fryer 3rd.

In electric Graeme Gulbin came in first beating Kevin Fryer by 5 seconds with Gavin Dunn 3rd, 11 seconds behind Kevin, It was quite spectacular in the landing area with everybody battling to keep their model up and gain those valuable seconds. In I/C we had 7 entries with 3 getting into the fly off and electric had 7 entries with 6 in the fly off.

Then lunch with Dave Sampson cooking the hamburgers with the lot and I mean the LOT. They were huge and delicious. Thanks Dave.

Then after lunch we had climb & glide with 6 entries, 3 electric and 3 I/C and 4 of these flyers were Ballarat boys who love this event. Again the ever reliable "Mr Electric" Gavin Dunn came in 1st flying Lyn Clifford's big Bomber. Next was Kevin Fryer with his converted to electric Cumulus and 3rd was Danny Missen flying his electric bomber.

Unfortunately after this event the rain started pelting down again and there was thunder and lightning so we all drank coffee and ate lovely fruit cake and waited, but by 4pm most guys had decided to go home as the rain didn't look like stopping.

The new Ballarat field is very good and seems to get better each visit through the efforts of the members. If it had not been for the bad weather it would have been a great day thanks to the friendliness of the Ballarat boys, thank you. Brian L.

ABOVE: Placings for 1/2A Electric Texaco L to R: 2nd Kevin Fryer 1st Graeme Gulbin and 3rd Gavin Dunn. RIGHT: Placings for 1/2 A Texaco 2nd K Fryer, 1st Brian Laughton, 3rd Lyn Clifford. BELOW: Brian Laughton's Albatross coming in with 1st place in ½A Texaco. BELOW RIGHT: Lyn Clifford's Stardust Special climbing out in ½A Texaco fly-off.

BALLARAT 26th November 2017
Results from the Contest Director

ELECTRIC ½A TEXACO

	Name	Model	Engine	Sec/cc	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Graeme Gulbin	Stardust			600	600			1098	2298
2	Kevin Fryer	Atomiser			600	600			1093	2293
3	Gavin Dunn	Stardust			600	600			1082	2284
4	Danny Missen	Stardust			600	600			924	2124
5	Steve Gullock	Lil Diamond			600	600			575	1775
6	Brian Laughton	Albatross			600	600			L/O	1200
7	Ted Arnup	Stardust			600	483	Out			1083

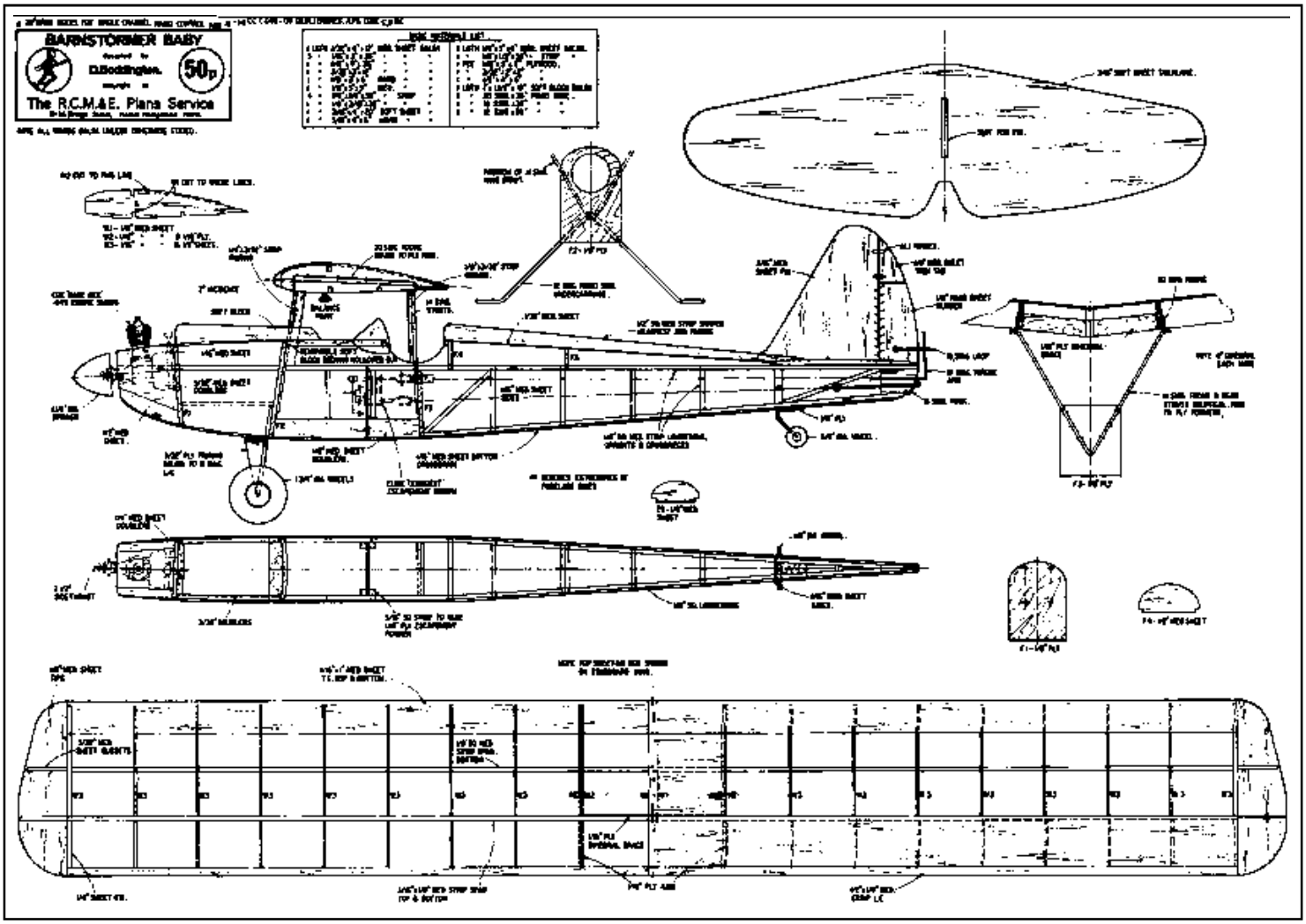
CLIMB AND GLIDE

	Name	Model	Engine	Sec/cc	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Gavin Dunn	Bomber	Electric	30	515	689				689
2	Kevin Fryer	Cumulus	Electric	30	515					515
3	Danny Missen	Bomber	Electric	30	408	500				500
4	D Sampson	Playboy	OS 40	30	422	287	419			422
5	Steve Gullock	Bomber	Enya 40	30	383					383
6	K Howard	Dallaire	Enya	30	187	208	300			300

BALLARAT 26th November 2017
Results from the Contest Director

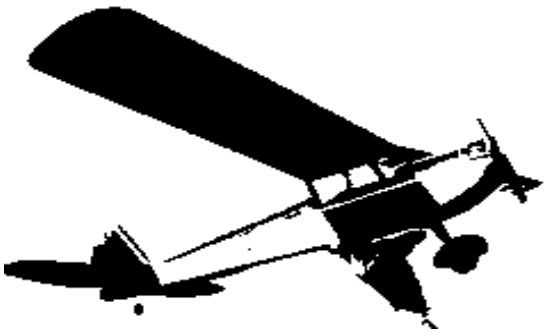
½A TEXACO

	Name	Model	Engine	Sec/cc	Rd 1	Rd 2	Rd 3	Rd 4	F/O	TOTAL
1	Brian Laughton	Albatross	Cox		420	420			853	1693
2	Lyn Clifford	Stardust	Cox		420	420			740	1580
3	Kevin Fryer	Cumulus	Cox		420	420			470	1310
4	Brian Dowie	Bomber	Cox		420	L/O	417			837
5	Pat Keely	Stardust	Cox		199	231	118			430
6	Don Grant	Anderson Pylon	Cox		L/O					
7	Robert Taylor	Stardust	Cox		DNF					



BARNSTORMER BY DAVID BODDINGTON AND VARIATIONS
NOMINATED MODEL FOR 2018 COWRA MAC OILY HAND EVENT IN 2018

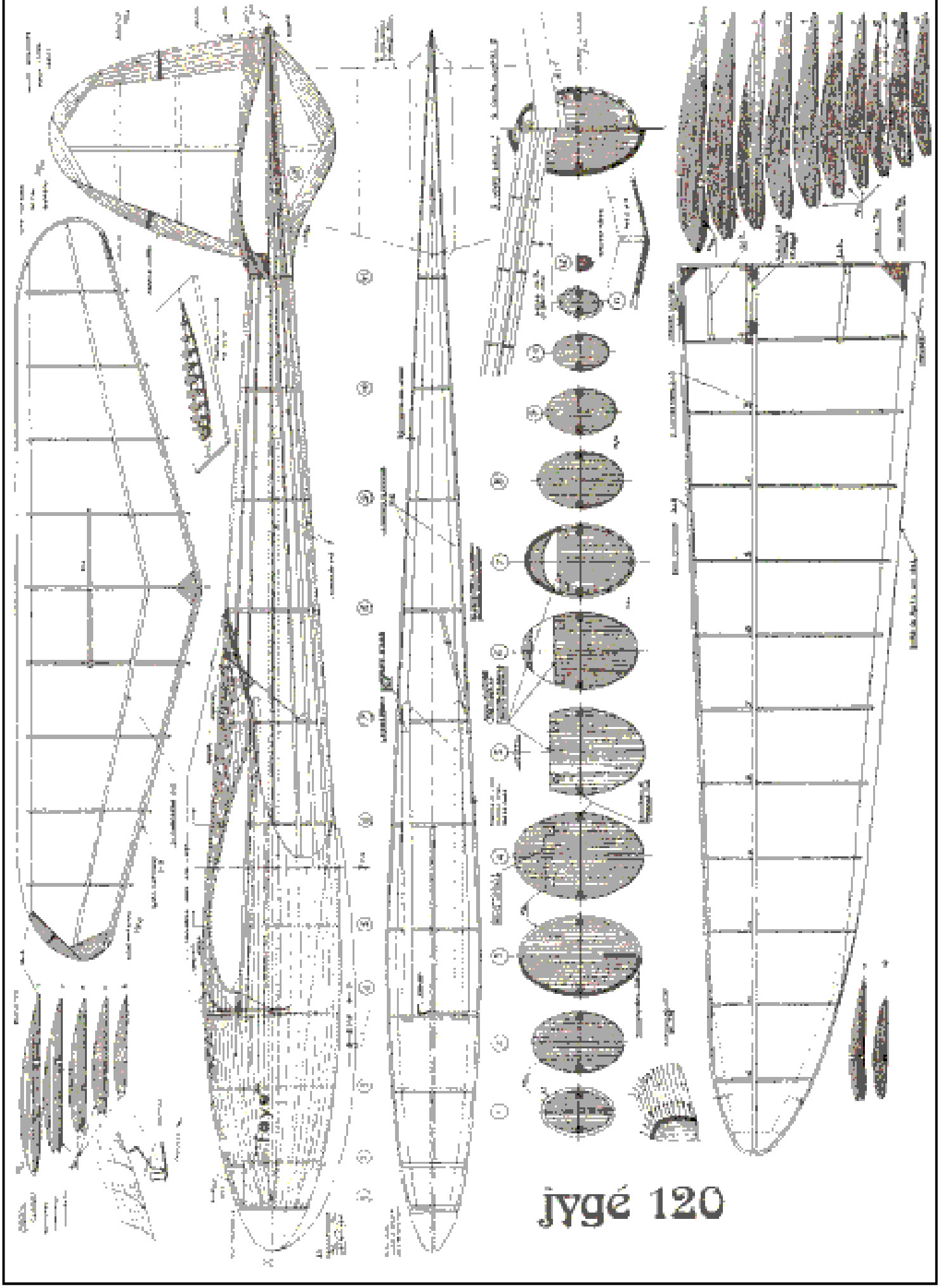
Barnstormer Baby - PDF Plan available at: https://outerzone.co.uk/download_this_plan.asp?ID=4982
Barnstormer 52 - PDF Plan available at: https://outerzone.co.uk/plan_details.asp?ID=8785
Mighty Barnstormer - PDF Plan available at: https://outerzone.co.uk/download_this_plan.asp?ID=6493



About this Plan

Barnstormer Baby - Sport model for single channel RC and .8 - 1.0cc engines. A reduced size version of David Boddington's delightful Barnstormer.

Quote: - "When I particularly like the appearance and flying characteristics of a specific model design, I frequently build a number of different versions of it... this system works fine providing the original design is sufficiently stable to be flown well with rudder-only equipment... this model has a lot of in-built strength, so medium density balsa will be sufficient for most areas. The main departure from the larger versions of the Barnstormer is the use of piano wire for the cabane struts and undercarriage in place of dural."


Jygé 120

FOR OLD TIMER'S SAKE

By Don Howie.

OILY HAND MODELS

Small diesels can be difficult to start if the piston/cylinder fit is not up to standard. Fortunately, recent old-style diesels, such as the MP Jet 0.6cc Classic diesel are set up correctly and gives very easy starting, even when using synthetic oil (Cool Power) in the fuel.

Oily Hand Weekend - Cowra, Sat. 26th August, 2017. Alan Nooster 28inch span R/C Fli Bi MP Jet 0.6cc Classic Diesel.

Alan Wooster from Hervey Bay, Qld., has fitted his MP Jet to a 28inch span R/C Fli-Bi model, which weighs 440 grams with two servos for rudder and elevator. It is finished with yellow tissue over mylar on the wings and yellow tissue on the tail and fin. An alloy undercarriage is fitted and with the blue paint on the fuselage, making it a great looking version of the 1978 design by the late David Owen.

The original Fli-Bi model at 23inch span by the writer, has the nose extended as the engine fitted is a 0.4cc V.A. replica of the 2.13cc Micro diesel, made in the U.S.A. in 1948. David Owen used a DC Merlin 0.76cc diesel mounted upright in his original model, which would have given plenty of power. After flying my model many times, and as it is free flight and prone to crashing if not set up correctly, I have now included several degrees of right thrust, along with left rudder trim to give only a slight turn on the climb. I use about 30% castor oil in the fuel for this small engine, so giving good piston seal with easy starting.

23inch span Fli-Bi by Don Howie, 7½oz, replica 0.4cc Micro Diesel cream air span on wings and tail, Humbrol paint on fuse and fin.

Maris Dislers is our diesel expert in my State (South Australia) and he recently built a 24inch span version of the 35inch span Veron "Cardinal" kit, first introduced in 1950. The model was built for a 0.24cc Clan diesel first built in the United Kingdom about twenty years ago for engine collector Mike Clanford. This turns a 6x4 yellow nylon prop nicely and gives this model great performance. The engine was more recently built by C.S. in Shanghai, China.

The radio fitted to Maris' model is from a three channel 2.4Ghz Helicopter, bought for about $33.00 online, the receiver and two servos being very small and the original Lipo batteries are also quite small, giving much longer duration, as it is not turning rotor blades. The elevator surfaces and rudder is quite small, so not to over control this basic F/F model. I was amazed with the range on the ground as you would lose sight of the aircraft in the air before running out of radio range. The model has traditional tissue and dope finish.

Next model shown is the Keil Draft "Champ" C/L model that won fastest time at the SAM 1788 Champs, Canowindra, 2017. It was built and flown by Fred Pearson from Coffs Harbour, NSW, and is very nicely built with authentic Keil Kraft "Champ" transfer on the fin. The MP Jet Classic 0.6cc diesel, made in the Czech Republic, and at a reasonable cost, is a perfect engine for the model.

Oily Hand Weekend - Maris Dislers (S.A.) 24inch span Veron Cardinal (original 35inch span) Clan 0.24cc diesel

TAYLORMADE PROPS

Robert Taylor is a long-time member of the Cohuna Club in Northern Victoria and in competition started first in Pylon Racing. I remember in the early nineteen seventies when the Prather Prop Gauge was introduced by Terry Prather in the U.S.A., so designers and home constructors of propellors, and pylon racers could design propellors with constant pitch all along the blade.

I remember Gordon Burford showing me this gauge in the early nineteen seventies, when he was designing his new Taipan composite

props for injection moulding. Robert Taylor has been making wooden propellors for Oldtimer Texaco with constant pitch and constant thrust along the blade. Looking at the prop on his Texaco model shown, the tips curve up and he uses a wave flow near the hub to get more thrust near the centre.

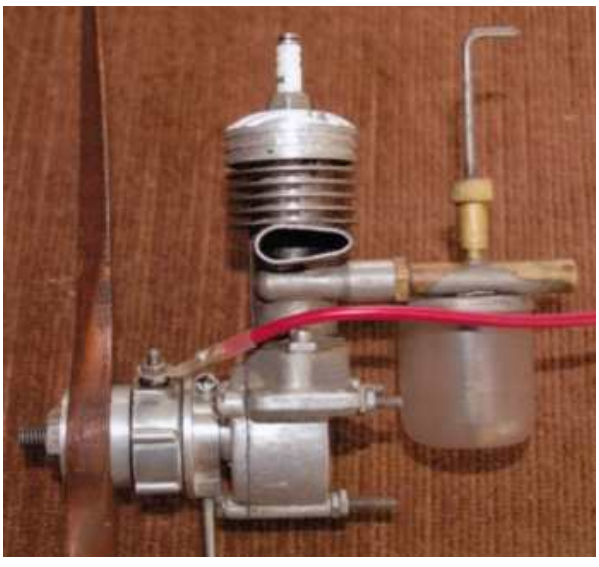
The next photo shows two of his wooden propellors, being held by Robert at the SA/Vic State Champs last May, 2017. Robert had to design a special machine to make these props so the pitch is correct, so people that use his props will get excellent results.

SPARK ENGINES.

Recent trend is the use of spark engines in Oldtimer Texaco, rather than the old, but reliable and long lasting OS 60 open-rocker four-stroke engine. Don Grant from Drouin, Victoria, used an Anderson Spitfire 60 sparkie, introduced early 1940, to power his Lanzo Bomber and win Oldtimer Texaco at the SA/Vic State Champs in 2017 at Cohuna, Vic. This original Anderson 60 was lacking power, but was very strong with single ball-race on the crankshaft and it had a spark ignition timer that worked very well. In June, 1948, they increased the stroke by 1/16 inch, making the capacity now .65 cubic inch.

The stroke in the Anderson Spitfire was increased by placing the crank pin 1/32 inch further out on the flywheel and to increase the power, sub-piston was included with two holes drilled front and back in the cylinder and liner. The holes are the way to distinguish the .65 engine from the .60 size engine. Don Grant also won Oldtimer '38 Antique at the SA/Vic Champs using an Anderson Spitfire .65 in his Lanzo RC-1.

Above: Early 1948 Anderson Spitfire 60 fitted to Don Grant's Lanzo Bomber.
Below: 1939 Madewell .147 cubic inch Spark engine fitted with modified McCoy timer. Made by Jack Keener and Jim Brown, Oaklands, California. USA.



The next engine shown is one of the first Madewell engines which was made by Jack Keener and Jim Brown at Oakland, California, USA. It is 0.417 cubic inch (2.5cc) capacity and the engine shown (owned by Bill Britcher) was made in 1939.

Small engines back in 1938/39 meant that smaller models could be flown, but the cost was not reduced greatly and more time was needed to get closer to tolerances and fit. I have to admit that Bill Britcher and I was unable to get it to run on spark ignition when tested recently. The Madewell 49, built after the war, had a good reputation as a reliable spark engine.

SAM 1788 Champs Canowindra 2017 - Fred Pearson's nice looking Green & White C/L KeilKraft "Champ" MP Jet 0.6cc Classic Diesel - 1st Place at the Champs.

Above: Robert Taylor with his Lanzo Airborne OS 61 FS Texaco model fitted with Taylor made Special Texaco Wood Prop.
Below: Taylor made Propellors by Robert Taylor, Cohuna, Vic.

ALICE SPRINGS
Masters Games
13 - 20 October 2018
The Friendly Games

Model Aircraft Flying

The Alice Springs Masters Games

Old Timer Competition

Is Central Australia on your bucket list? Come and fly at the 2018 Alice Springs Masters Games and experience aeromodelling in the Red Centre!

This national sporting and social event includes 36 sports over 7 days and, for the first time in 2018, will feature F5J Gliders, IMAC and Old Timers.

Old Timer Events

I.C.	Electric
Texaco	Texaco
Duration	Duration
Gordon Burford	1/2A Texaco

Come and join us for a week of fun and flying at "The Friendly Games". Places are limited, so get in early.

Further Information

Contact Stephen Henderson
0421 052 459
flying@alicespringsmastersgames.com.au

www.alicespringsmastersgames.com.au
freecall 1800 658 951 facebook.com/alicespringsmastersgames @friendly_games

WHEN YOU ARE OVER SIXTY.....

I was standing at the bar one night minding my own business. This FAT ugly chick came up behind me, grabbed my behind and said, "You're kind'a cute. You gotta phone number?"

I said, "Yeah, you gotta pen?"

She said, "Yeah, I got a pen".

I said, "You better get back in it before the farmer misses you."

Cost me 6 stitches...but, when you're over sixty.....who cares?

****

I was talking to a young woman in the bar last night. She said, "If you lost a few pounds, had a shave and got your hair cut, you'd look all right."

I said, "If I did that, I'd be talking to your friends over there instead of you."

Cost me a fat lip, but... When you're over sixty.....who cares?

****

I was telling a woman in the pub about my ability to guess what day a woman was born just by feeling her breasts.

"Really" she said, "Go on then... Try."

After about thirty seconds of fondling she began to lose patience and said, "Come on, what day was I born?"

I said, "Yesterday."

Cost me a kick in the nuts, but... When you're over sixty.....who cares?

****

I got caught taking a pee in the swimming pool today.

The lifeguard shouted at me so loud, I nearly fell in.

Cost me a bloody nose, but... When you're over sixty.....who cares?

****

I went to the pub last night and saw a BIG woman dancing on a table.

I said, "Good legs."

The girl giggled and said, "Do you really think so?"

I said, "Definitely! Most tables would have collapsed by now."

Cost me six more stitches, but... When you're over sixty.....who cares?

GRAMMAR LESSON

No English dictionary has been able to adequately explain the difference between these two words. In a recent linguistic competition held in London and attended by, supposedly, the best in the world, Samdar Balgobin, a Guyanese man, was the clear winner with a standing ovation which lasted over five minutes.

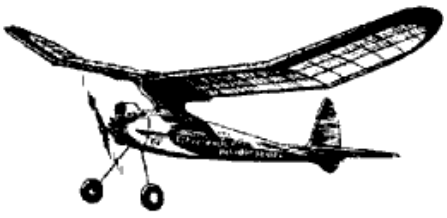
The final question was: 'How do you explain the difference between COMPLETE and FINISHED in a way that is easy to understand?' Some people say there is no difference between COMPLETE and FINISHED. Here is his astute answer:

"When you marry the right woman, you are COMPLETE. When you marry the wrong woman, you are FINISHED. And when the right one catches you with the wrong one, you are COMPLETELY FINISHED!"

He won a trip around the world and a case of twenty-five year old Scotch!

SECRETS TO INNER PEACE

If you can always be cheerful, ignoring aches and pains,
If you can resist complaining and boring people with your troubles,
If you can eat the same food every day and be grateful for it,
If you can understand when your loved ones are too busy to give you any time,
If you can take criticism and blame without resentment ,
If you can conquer tension without medical help,
If you can relax without alcohol,
If you can sleep without the aid of drugs,
Then You Are Probably the Family Dog!



TRIVIA

In The Early 20th Century, Which Of These Dangerous Compounds Was Routinely Added To Makeup?

Atropine	Arsenic
Radium	Lead

Answer →

Answer: Radium

By the start of the 20th century, we'd mostly gotten the trend of putting toxic things in makeup out of our system. Gone were the days of ladies powdering their faces with arsenic-based powders or smearing lead-based makeup on their cheeks. Still, the era of proper product testing and safety regulation was decades off, and there was still plenty of time left in the early 20th century to squeeze in some horrible choices.

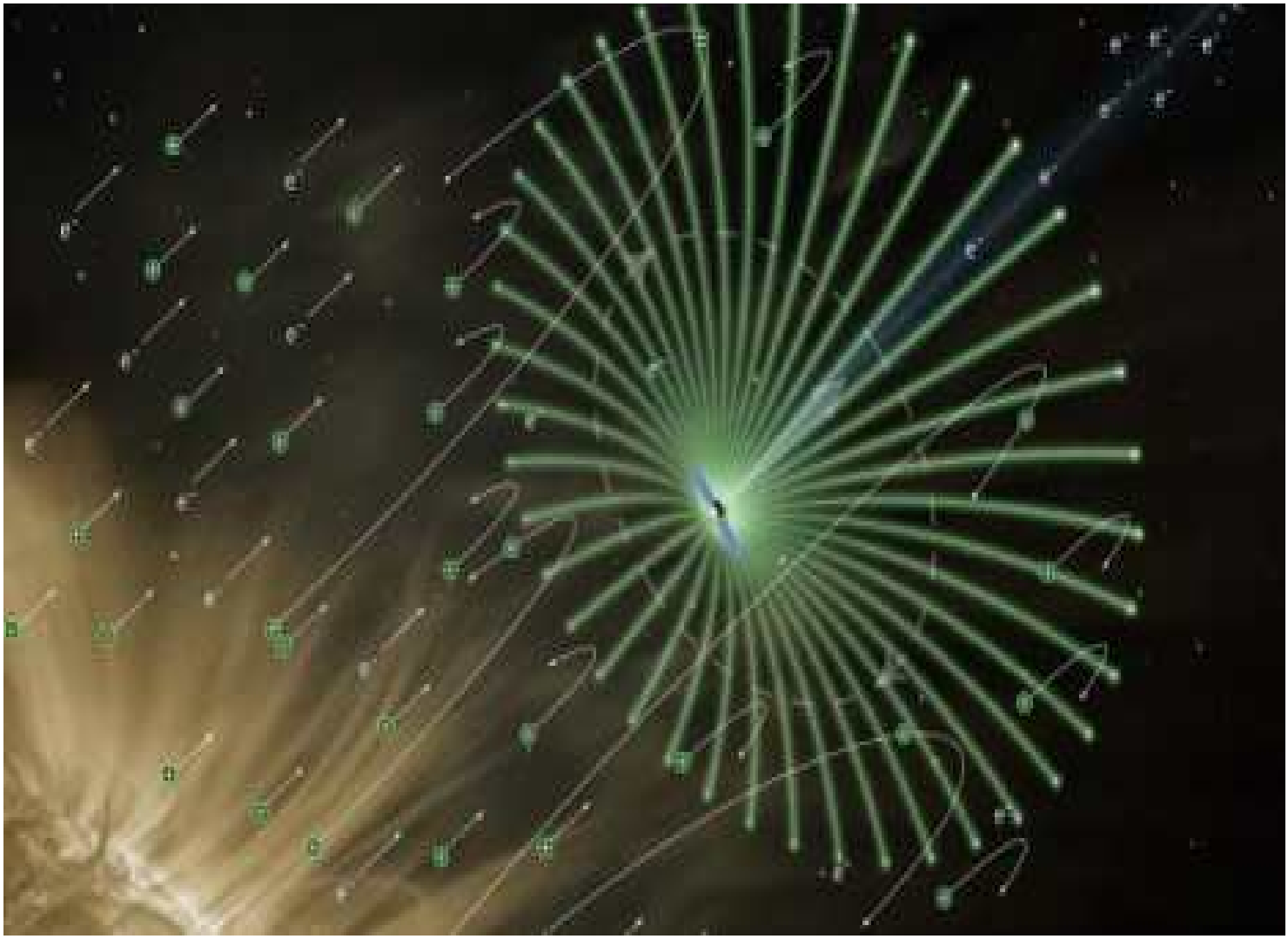
The most notable of those choices was the inclusion, from around 1910 until the 1930s, of the radioactive substance radium, in everything from lipstick to eye shadow and every other makeup you can think of (as well as numerous other products, for that matter, like radium-infused butter and underwear). The products purported to help keep you young and protect your skin while, ironically, in reality they were damaging your cells and accelerating the deterioration of your body. People exposed to high levels of radium, like the famous "radium girls" who applied glowing radium paint on watch faces and military instrument panels, suffered from tumors, bone loss, and many died within years of the exposure.

Eventually, due largely in part to a very high profile lawsuit filed by five of the aforementioned "radium girls", the public trust in radium shifted dramatically and in 1938, the Food, Drug, and Cosmetic Act outlawed the deceptive marketing practices that allowed companies to shamelessly tote the imagined health benefits of smearing radium-based makeup on your face or radium-infused butter on your toast.

A NEW WAY OF PROPELLING SPACECRAFT MAY OPEN UP THE ASTEROID BELT

The electric solar wind sail brings high hopes.

Space travel is expensive. Missions such as *Cassini*, a recently ended exploration of Saturn and its moons, and *New Horizons*, a trip to Pluto and one or two more distant objects in the far reaches of the solar system, have involved launching craft weighing hundreds or thousands of kilograms. For big, essentially unique targets such as these, that expense has proved worthwhile. But as exploration moves on to smaller and more numerous objects, like asteroids, individual visits at costs of hundreds of millions, or even billions of dollars are no longer a feasible idea. Some sys-



tem of mass robotic space travel needs to be devised. And Pekka Janhunen of the Finnish Meteorological Institute in Helsinki thinks he has invented one.

In 2004 Dr Janhunen put forward the idea of a sail that harnesses the solar wind, a stream of charged particles emanating from the sun which manifests itself on Earth in the dramatic displays of the aurorae. He and his colleagues have since refined the idea. In a paper they presented to the European Planetary Science Congress, in Riga, Latvia on September 19th, they proposed that spacecraft equipped with their new propulsion system could make a round trip to the asteroid belt in little more than three years. A fleet of 50 such craft, weighing about 5kg each and thus capable of being launched by a single rocket, could visit 300 asteroids, survey them and return to Earth for a thrifty €60m ($72m) or so, including the cost of launch.

The electric solar wind sail (E-sail), as Dr Janhunen dubs his invention, consists of four wires, each 20km long but just 25 microns (millionths of a metre) thick. These are braided together into a tether. For launch, this tether is wound tightly around a small motorised reel inside the craft. Once in space, the wires are unwound by the motor, assisted by the centripetal force of the spinning craft. Once fully deployed, the tether thus sweeps out a circle with a diameter of 40km.

The craft's propulsion comes from the interaction between this tether and the hydrogen and helium nuclei that form most of the mass of the solar wind. These nuclei are positively charged. And so is the tether, because the craft also carries a solar-powered electron gun that shoots out into space a stream of electrons scavenged from the wires. Since electrons are negatively charged, ejecting them in this way keeps the tether positive. Since like charges repel, the positive tether reflects the positive hydrogen and helium nuclei back where they came from. And since to every action there is an equal and opposite reaction (Newton's third law of motion), that reflection drives the spacecraft forward.

If the tether were stationary with respect to the craft, the result would be a lopsided force. But because it rotates, that force evens out after an entire circuit, propelling the craft ahead. Varying the output of the electron gun, however, can create a lopsided force deliberately, permitting the craft to be steered. And, though the acceleration produced is small (1mm per second per second), there is little in the vacuum of space to slow the craft down. It can therefore reach a speed of tens of kilometres per second after a year of travel, making its rapid jaunt to the asteroid belt possible.

In addition to the E-sail, the craft Dr Janhunen envisages would have a small telescope on board, and also an infrared spectrometer. These would analyse the surface of every asteroid encountered. Each probe would be able to fly to within 1,000km or so of six or seven asteroids, snapping photos and collecting data. Probes would not have the power to broadcast these data all the way back to Earth from the asteroid belt. But they would, instead, be able to store them in flash-memory chips, for relay to Earth on their return home.

In some ways an E-sail resembles a solar sail, a rival idea for powering craft cheaply through space. A solar sail provides propulsion because the sunlight it reflects exerts pressure on the sail, pushing it forward. But E-sails have an important advantage over solar sails. Once unfurled, there is no easy way to stop a craft with a solar sail gathering speed. An E-sail-powered craft can be prevented from accelerating simply by switching off its electron gun. This means it can return to Earth under the influence of the sun's gravity.

E-sails have, however, not been tested. A solar sail has. *Ikaros*, a craft launched in 2010 by JAXA, Japan's space agency, successfully deployed such a sail with an area of 196 square metres. Dr Janhunen hopes to make a start on proving his technology by unwinding a tether 100 metres long in space later this year.

For those of a romantic disposition, E-sails may come to be seen as the technology that will unlock the asteroid belt for commercial exploitation. There is reason to believe that some asteroids are rich in valuable metals, such as platinum and iridium. Craft equipped with many tethers could carry heavy payloads - perhaps up to a tonne - that would permit mining equipment to be deployed and cargoes of metal to be brought back to Earth.

One day, perhaps. But, in the meantime, E-sails do sound a plausible way of extending humanity's understanding of the nearby cosmic neighbourhood.

FROM ALBERT FISHER

awfisher@internode.on.net

Your readers may be interested in this.

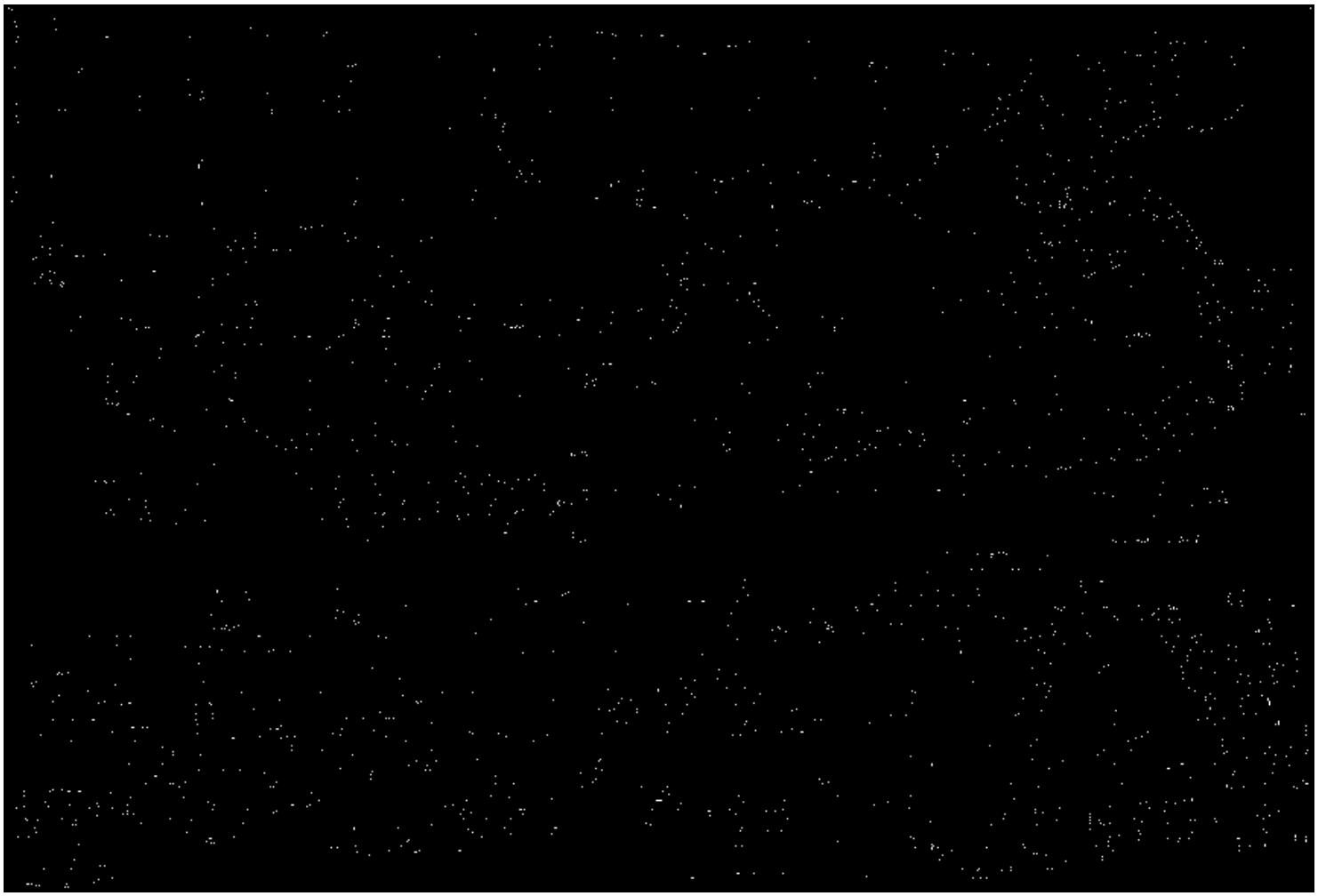
I found the article with the plan for the DG67 in one of the SAM 2001 Italy L'Aquilone magazines .

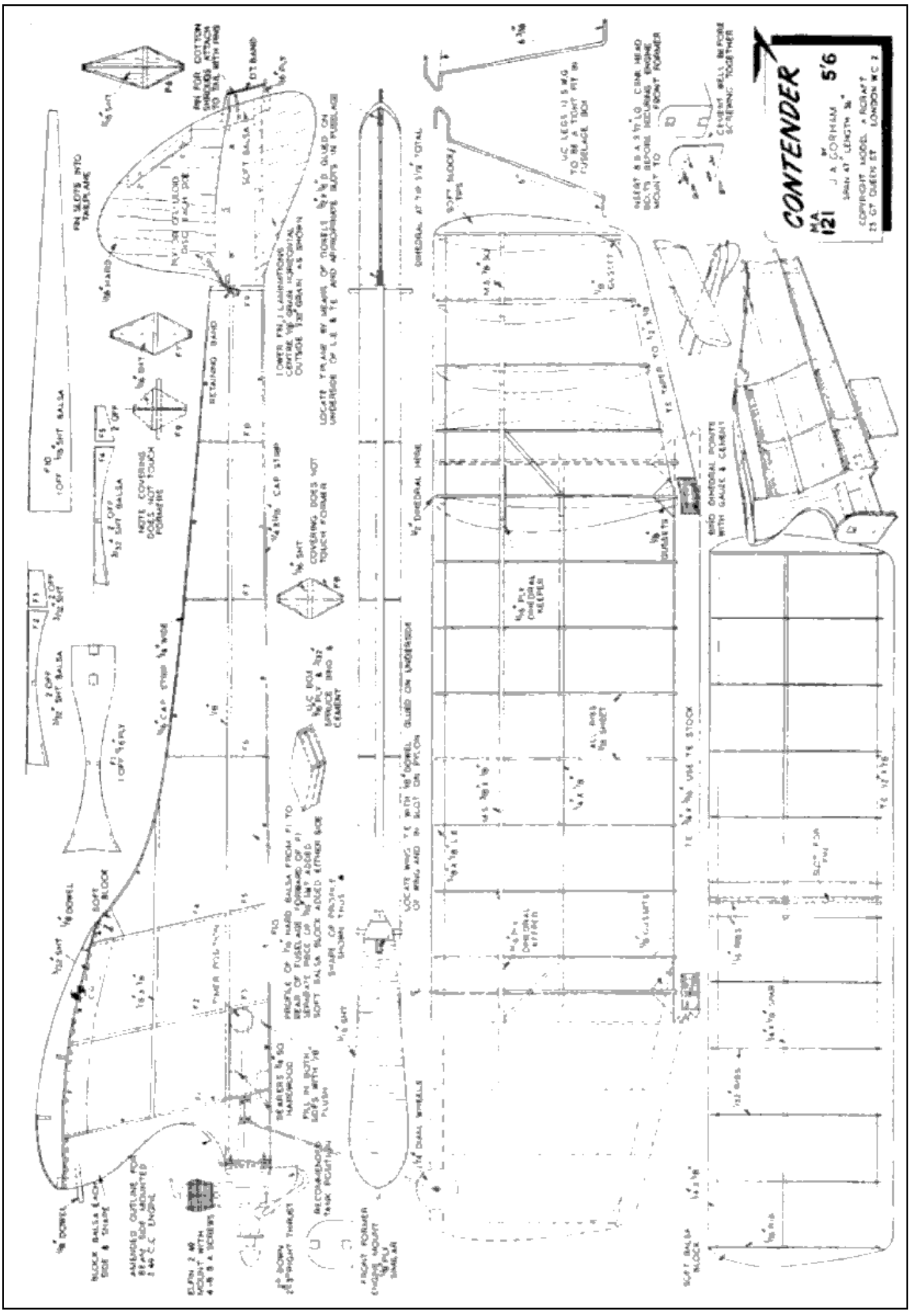
I was going to build the DG42 but it was too easy to build and it did not have the same good looking lines as the DG67 airplane.

I increased the plan to three metres wing span and it came in at 2KG.

Unfortunately at my flying field there is not room to run out a bungee or a winch so I have fitted a Turnigy C3548-900 motor with a 13x6.5 inch propellor and powered this with a four cell LiPo battery.

However, we do get very good thermals at our flying field so I also fitted pop up air brakes. The tip panels are removable for transport. The wing and tail assembly are covered with Airspan, the fuselage is covered with Hobbyking shrink plastic.





J.A Gorhams "Contender" from Model Aircraft February 1952

Machine Guns Take Flight During The Great War by Tom Laemlein

Man had barely learned to fly when he decided to both fly and fight. With both in their infancy, the machine gun was the natural partner of the aircraft in this endeavour.

Don't try this at home. On June 7, 1912, the Lewis Gun and a U.S. Army Wright Flyer went airborne together for the first time at College Park, Md.

On June 7, 1912, with a prototype Lewis Gun strapped to the "passenger seat" and foot bar of a Wright Model B Flyer, U.S. Army Capt. Charles Chandler and his pilot, Lt. Roy Kirtland conducted the first successful firing test of a machine gun carried aloft in an airplane. It is not known what they were shooting at that day over College Park, Md. The fact that the Lewis Gun and the Wright aircraft worked together was enough to cement the concept in many military minds. World War I would soon put the new notion to the ultimate test.

KNIGHTS OF THE AIR

When the guns of August 1914 fired across Europe, the thunder of the cannons drowned out the insect-like buzzing of the first aircraft. That soon changed as the great armies of the empires soon became bogged in the static warfare of the trenches. Aircraft offered the best means (sometimes the only means) to see beyond the mud and gore of "No-Man's Land" and provide reconnaissance of enemy positions, troop movements and intentions.

Early in the war, this German aviator took firepower to the skies with a P08 Luger Artillery Model pistol with shoulder stock. This combination was popular with early war German fliers, as was the Mondragon self-loading rifle.

In the earliest days, opposing recon pilots merely waved or saluted their enemies. Simply flying the early crates was dangerous enough. But the days of airborne chivalry were short-lived. Weapons soon appeared in the cockpits, and the carnage on the ground was repeated in the air. Draglines and grappling hooks evolved to pistols, shotguns and carbines.

This Hotchkiss Portative machine gun was mounted high in the forward cockpit of a French Deperdussin TT monoplane.

The Imperial German Flying Corps adopted the Mondragon Model 1908 self-loading rifle (chambered in 7x57 mm) and issued them to observers in two-seat aircrafts. Made in Switzerland for Mexico, the Mondragon became the "Fl.-S.-K. 15" (*Flieger-Selbstladekarabiner, Modell 1915*, or the Aviator's Self-loading Carbine, Model 1915). These were issued with 30-round drum magazines, and the advanced rifles were certainly a major improvement over bolt-action rifles or Luger pistols. But everyone knew that the machine gun offered the real firepower needed in aerial combat.

This early German AEG two-seater has a Parabellum machine gun mounted to swivel forward at an angle. Note the wire guards to prevent firing into the propeller arc.

TRACTORS AND PUSHERS

An aircraft with a forward mounted engine was called a "tractor." An aircraft with a rear-mounted engine was called a "pusher." Tractors were faster and more powerful, but the forward-mounted propeller presented a massive obstacle to firing in that direction. Machine guns were mounted at awkward forward-firing angles, requiring a strange crab-like approach to the target. Others were mounted above the top wing, to fire over the propeller arc. This was more effective, but still quite difficult to aim and nearly impossible to re-load or clear a jam. Consequently, most early "tractor" aircraft relied on the observer's gun mounted in the rear cockpit.

Right: A German LVG two-seater with a Parabellum machine gun was set up to fire forward over the wing and propeller. The observer needed to stand in his cockpit to operate it.

Pusher aircraft offered significantly reduced aviation performance. However, their

forward view was excellent, and there were no worries about shooting off one's own propeller when firing to the front. Thus, "pusher" aircraft became the best of the early aerial gun platforms. Nonetheless, danger from "friendly fire" was always present. It was necessary to develop elaborate methods of catch spent casings, ejected from machine guns, as the hot brass passing rearwards in the aircraft's slip stream could easily shatter the propeller spinning behind. The best solution was still to come.

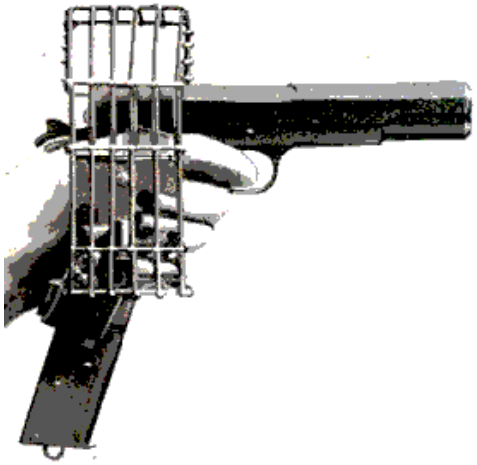
The British Fe2b "pusher" biplane had a rear-mounted engine, which was awkward, but in the early days it provided the best option in forward-firing guns.

THE FIRST AERIAL MACHINE GUNS

When we think of the classic machine guns of World War I, it is normally the belt-fed, water-cooled guns that come to mind. But they are particularly heavy and not easily accommodated within the tight confines of a wood and canvas flying machine.

During 1914, France's Raymond Saulnier successfully experimented with the relatively light Hotchkiss Model 1909 Machine Rifle (also called the Benet-Mercie Machine Rifle or the Hotchkiss "Portative") in one of his aircraft. The Hotchkiss Model 1909 was light enough for aerial work, and its 600 r.p.m. cyclic rate provided the right level of firepower. However, it was fed by rigid 25-round strips, which proved difficult to reload in the midst of combat. A 75-round "bobine" drum with a belt was developed, and this was helpful, but the belt was non-disintegrating and the heavy new weight (on the right side) threw the gun out of balance. Even so, the Hotchkiss Model 1909 was the preeminent Allied aviation machine gun in the first year of the war.

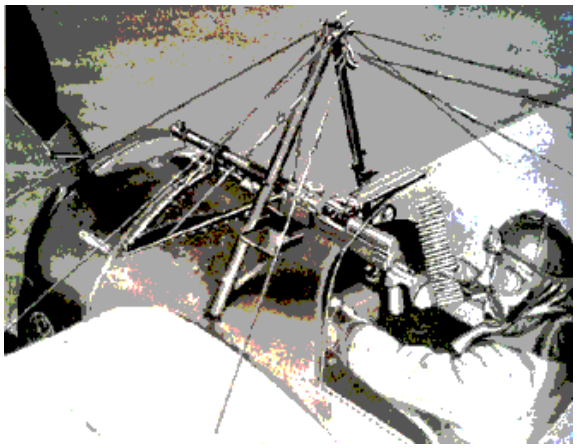
The true jewel in the crown of early aviation machine guns was the Lewis Gun. American-designed (but sadly ignored by U.S. Army Ordnance Dept.), it was quickly adopted by the Belgians and the British. Allied aviators coveted the Lewis Gun from the start. Unfortunately, Lewis Guns were in short supply, and British, French, Italian and Belgian aviation armorers were forced to beg, borrow and steal Lewis guns until the turn of 1918.



A special cage was developed for the M1911 pistol, and it intended to catch the ejected cartridge casings to prevent them from passing through the propeller of a "pusher" aircraft.

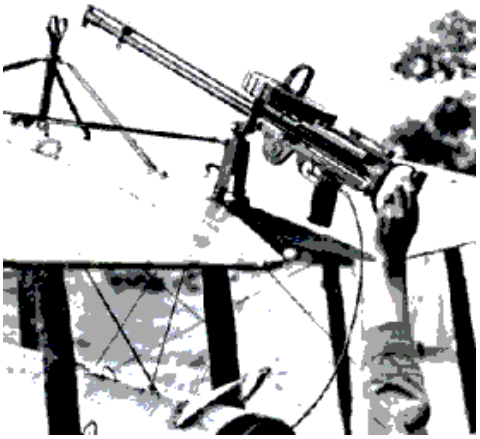
ROLAND GARROS AND THE "DEFLECTOR PLATES"

Roland Garros had been a pre-war daredevil pilot, and he was the first man to fly across the Mediterranean. After the war began, Garros became a recon pilot. In December 1914, he visited the Morane-Saulnier Works, to learn about Saulnier's experiments in attaching metal deflector wedges to propeller blades, allowing a machine gun to be fired forward through a whirling propeller. Working with Saulnier, Garros soon had a deflector plate fitted to his Morane-Saulnier Type L aircraft.



This strip-fed Hotchkiss Portative machine gun mounted on a French Morane monoplane is in the style used by Roland Garros. Note the heavy deflector plates on the propeller.

Equipped with the deflector plates, Garros had a "flying gun," that could simply be pointed at the enemy aircraft. As such, on April 1, 1915, Garros achieved the first aerial victory by firing through a "tractor-aircraft" propeller. He shot down two more German aircraft within the next two weeks. On April 18th, his plane was hit by ground fire, and he was forced down behind German lines. Unable to destroy his aircraft before he was taken prisoner, the Germans learned the secrets of his curious modification.



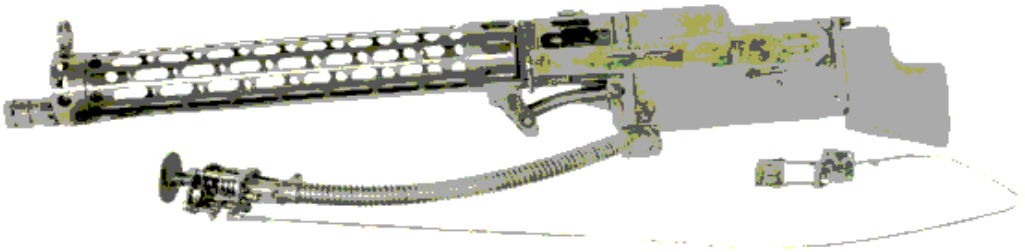
The overhead mount was one solution, demonstrated by a Lewis machine gun mounted on the upper wing. Note the locking system and the firing lanyard attached to the trigger. Changing ammunition drums was extremely awkward in combat.

ANTHONY FOKKER AND HIS INTERRUPTER GEAR

Anthony Fokker is usually credited with the invention of the "synchronizing gear" that allowed a machine gun to be fired through a spinning propeller. When Roland Garros was shot down in April 1915, and the armoured deflector plates on his propeller discovered, Germany's efforts on developing this interrupter gear were significantly accelerated.

Fokker was a Dutchman, an aircraft engineer, and a skilled pilot in his own right. Evidence shows that a synchronizing device had been in development at

Fokker's company for nearly six months before Garros' capture. Regardless, the German Army Air Service wanted results, and quickly.



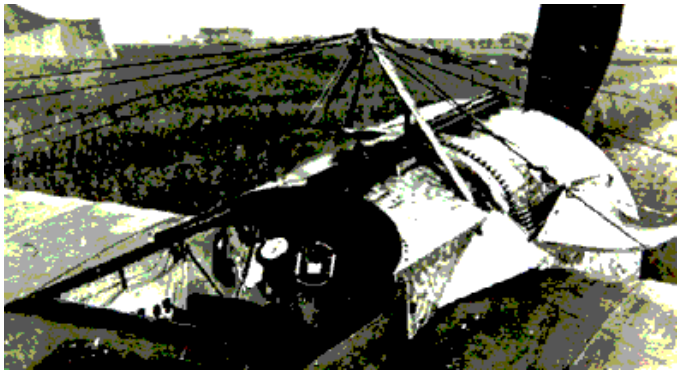
The Spandau 7.92 mm IMG08 was the air-cooled, aircraft version of the famous German MG08 machine gun.

The missing element proved to be Fokker's pushrod control mechanism that synchronized the machine gun to discharge only when the propeller spun out of the line of fire. As with every new design, there were failures. Within the first year of its introduction, several German pilots were lost when the interrupter gear malfunctioned and their propeller blades were shot off; they shot themselves down.

Despite the dangers, Germany was now in sole possession of the technology that would (temporarily at least) tip the fortunes of the air war in their favour.

THE FOKKER SCOURGE

Anthony Fokker's company produced a push-rod controller, a genuine synchronizing gear, where impulses from a cam driven by the engine controlled the firing of the machine gun, allowing it to fire forwards without damaging the propeller. It was quickly added to a Fokker-designed aircraft, the Eindecker (monoplane) fighter. Ultimately, the Eindecker would be the first aircraft developed to leverage a synchronized, forward-firing gun.



The Fokker Eindekker fighter was the first to mount a forward-firing gun synchronized with the propeller.

Armament for the Eindecker series was the 7.92 mm IMG 08 "Spandau" machine gun. Normal rate of fire was 500 rounds per minute, and this was slowed down considerably by the synchronization gear. Most Eindecker fighters carried just a single IMG 08, but experimental versions of the aircraft carried up to three guns, but the added weight of the additional guns and ammunition badly impacted the overall weak performance of the aircraft.

This Fokker Eindekker experimentally mounted triple IMG08 machine guns. Although presenting fantastic firepower, the weight of the triple guns and their ammunition was too much for the tiny aircraft to bear.

From August 1915 to March 1916, the awkward Eindekkers ruled the skies over the Western Front, gaining air superiority in what became known as the "Fokker Scourge." The myth of the Eindekker's performance was revealed in March 1916 when an intact example was captured and tested. At the same time, more advanced French and British aircraft, finally equipped with their own "interrupter gear," began to arrive at the front.

Eddie Rickenbacker, America's greatest World War I ace, poses aboard his SPAD 13 fighter in 1918. The twin Vickers guns set the standard for forward firepower until the early 1930s.

THE AIRCRAFT AND THE GUN ARE FOREVER LINKED

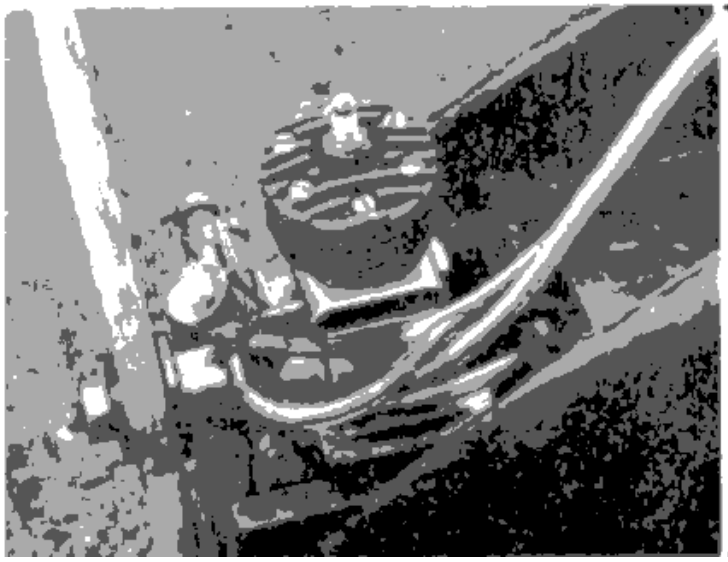
The remainder of the Great War witnessed the rapid progression of aerial armament. Synchronized, forward-firing guns became commonplace. Fighters carried them, bombers did, too. Machine guns like the German IMG 08, Allied Vickers, and Austro-Hungarian Schwarzlose were soon doubled up in search of maximum forward firepower.

Armament for the rear gunner in two-seaters continued to improve, but none better than the Lewis gun were found. Shortages of Lewis guns plagued the Allies until well into 1918 (when the Marines arrived in France, their Lewis Guns were taken away and given to American airmen). But, by the latter part of war, many British, French and American observers controlled a pair of Lewis guns, delivering as much firepower to the rear as was available in the front.

Specialized weapons packages were quickly developed as well, including up to quadruple-mounts of downward-firing machine guns in the belly of trench-strafing aircraft, controlled by the pilot and reloaded by the observer.

For the aircraft and the gun, World War I created a match made in the Heavens, and then consummated in Hell.

AERO MODELLER 466 September, 1956



Know Your Engine

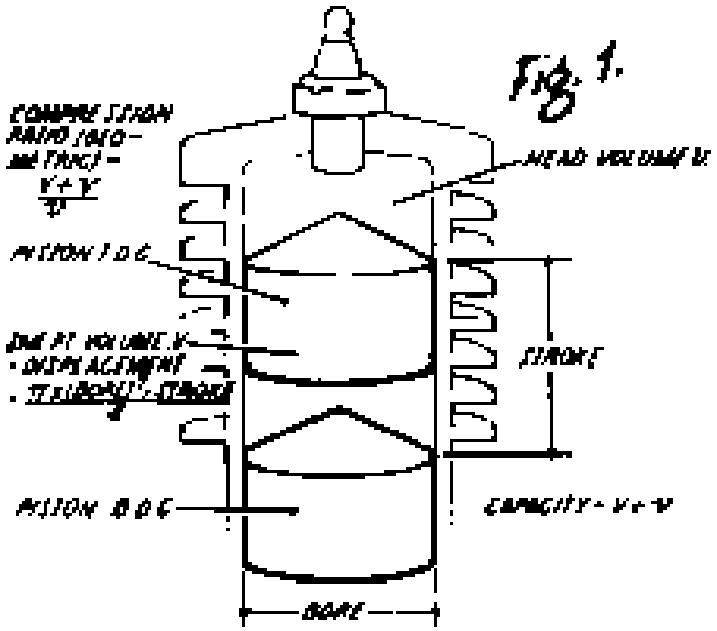
PART 6 EXPLAINS THE SIGNIFICANCE OF COMPRESSION RATIO IN MODEL ENGINES

Can you identify this engine and decipher the complex plumbing attached to its carburettor ?

Engine is a K&B 19 fitted with twin needle valves for radio control. Mass of plumbing is the air-bleed system attached to a Bonner escapement, for high or low speed.

The effective compression ratio of an engine is determined both by the geometry of the engine and its efficiency as a pump. The latter feature is commonly overlooked and the *geometric* compression ratio taken as the absolute criterion for performance. (For example, full size engines normally have the compression *lowered* when supercharged, except the low pressure blowers fitted to series production cars to improve performance). But, for example, suppose the (geometric) compression ratio of any particular engine is 10:1 and its pumping efficiency 60%. Then its *effective* compression ratio is only 6:1 - or the same as, say, an engine with an apparent ratio of 6:1 with a pumping efficiency of 100% (although the latter would be impossible in practice). This, in part at least, explains why some "hot" engines have (apparently) a relatively low compression ratio, compared with other racing designs which do not perform so well. It also explains why increasing the pumping efficiency of an engine can considerably improve its effective compression ratio and performance, although physically the engine is apparently unchanged.

Compression ratio is defined as the ratio of the total volume with the cylinder above the piston bottom dead centre position to the unswept volume, i.e., the small volume left in the head when the piston is at top dead centre - Fig. 1. The two "volumes" involved are the head volume (v) and the swept volume (V). The latter is readily calculated as the area of the bore *times* the stroke and is also called the *displacement*. The capacity of an engine, on the other hand, is equal to the swept volume or displacement *plus* the head volume, i.e., V + v.



The actual value of the head volume (v) is often difficult to calculate and, in fact, the actual volume required for a particular design is usually "guesstimated" rather than calculated. Or arrived at by trial and error methods in altering the shape of the head, or the top of the piston, or both. Thus the only true "size" rating of an engine is *displacement* and to speak of the capacity of an engine without knowing the head volume or compression ratio is quite wrong. In fact, nearly always when an engine is stated as "X" c.c. capacity, when it is meant that the swept volume or displacement of that engine is X c.c.'s.

In the case of diesels, of course, the head volume and thus both the capacity and compression ratio is made variable. Although a few fixed capacity diesels have been made, it is now universally recognised that a variable compression ratio is the most satisfactory method of adjusting the engine to run on different fuels and at different speeds.

Self-ignition stage

Without going too deeply into the technology of fuels it can be stated, in simple terms, that to get the fuel to ignite in the cylinder it must be raised to its spontaneous self-ignition temperature. If the self-ignition temperature of the fuel is low enough, it can be ignited by the heat generated by the compression of the fuel-air mixture in the head, this heat of compression being directly related to the effective compression ratio of the engine. If the self-ignition temperature of the fuel is too high for this to be realised employing practical compression ratios, then some other method of supplying

the heat must be provided, such as a spark plug or heated element. In the latter case, as in the glow plug, the fuel also has a catalytic action on the element, tending to heat it to red heat (e.g., as in the simple science experiment where a piece of platinum wire held in alcohol vapour will heat up to incandescence and set the vapour alight). The actual temperature at which the element will be maintained, however, is greatly influenced by the compression ratio, which has led to the variety of so-called "hot" and "cold" glow plugs.

The significance of compression ratio with diesels need not be discussed in detail since the working ratio is readily adjustable to give optimum running conditions. The main criterion, in fact, becomes the fuel, It can be mentioned, however, that conventional compression-ignition fuel oils, which are mainly paraffin-type oils, have a self-ignition temperature too high to be ignited by the maximum heat of compression normally generated in model engines. Hence they have to be mixed with a substance which has a lower self-ignition temperature (usually ether) and is a relatively poor fuel, as such. Add necessary lubricant and you have the basis of all diesel fuels - a paraffine oil (which is the base fuel), ether to promote easy starting and lubricating oil.

In addition, "dopes" are commonly added to promote smoother running - largely to reduce "ignition lag" and so make the mixed fuel burn quickly and uniformly. These are, to a large extent, inter-dependent on compression ratio, because they themselves tend to act as artificial compression raisers as the engine warms up. This means that it may be necessary to reduce the *geometric* compression ratio when the engine is hot; or, alternatively, compensate for the increase in compression ratio required with increasing operating speed. A particular virtue of the widely variable compression ratio is that it makes the diesel particularly flexible with regard to the types and formulations of fuels which can be used, although with at least one American diesel a doped fuel is essential for high speed running, because the available compression ratio is limited by a flange on the contra-piston.

In the case of glow motors, the position is rather different. The base fuel is methanol, which has a self-ignition temperature nearly twice that of diesel fuel and nearly three times that of ether. Hence a heated element is required to ignite it. (It is an interesting fact that an ether-methanol mixture *can* be used to start and run a diesel, although such a fuel mixture is not recommended! Similarly a "diesel" fuel can run a "Glo" engine, with the same reservations!).

The basic "glow" fuel then becomes methanol and lubricating oil, which is satisfactory up to a degree. However, to maintain the element at the required temperature for consistent firing, quite high compression ratios are desirable. In other words, an appreciable heat of compression must be added to the "chemical heat" generated by the fuel action on the element to keep the element glowing. The higher the compression the duller the element and the more prone the engine to cut as soon as the starting battery is disconnected.

The answer to this is the addition of another kind of dope to the fuel - a nitroparaffin, usually nitromethane. The actual action of nitroparaffin inside the engine is not clearly understood. Largely they appear to decompose and release oxygen so that the fuel burns hotter and the element glows brighter. A doped glow fuel thus requires a lower compression to maintain the element at its working temperature. Oddly enough, the addition of even a small percentage of nitro-methane to *diesel* fuel makes it useless. But some authorities condemn the mixing of nitroparaffins with paraffins as dangerous! This is harder on the element, but easier on the engine, for it has to do less work on the up stroke of the piston in compressing the fuel mixture. And unlike diesel fuels, where more than about 5% added dope has no further benefits (and may, in fact, detract from performance), increasing the proportion of nitro-methane up to as much as 40%, is usually consistent with steadily improving performance. Thus the "top" performing glow engines usually employ 40% "nitro" fuel.

The significance of compression ratio can thus be summarised in this form. For use with a "straight" glow fuel (i.e., no added nitromethane), a glow engine must be made with a high compression ratio. The geometric compression ratio required will depend a lot on the pumping efficiency and may need to be as high as 14:1 for good starting and continued running with the lead disconnected. On the other hand, such a high compression ratio will tend to make the engine kick back, particularly hand starting on small propellors, and be prone to start and run backwards, especially on "symmetrically" ported designs.

Decreasing the compression ratio will improve starting and enable the engine to go faster, because it has to do less internal pumping work. But unless nitro-methane is added to the fuel it will be prone to stop, or run inconsistently, once the starting battery is disconnected. With a lower compression ratio still and a "straight" fuel, starting may be difficult even with the battery lead connected and the plug just goes out once the engine is running and the lead disconnected.

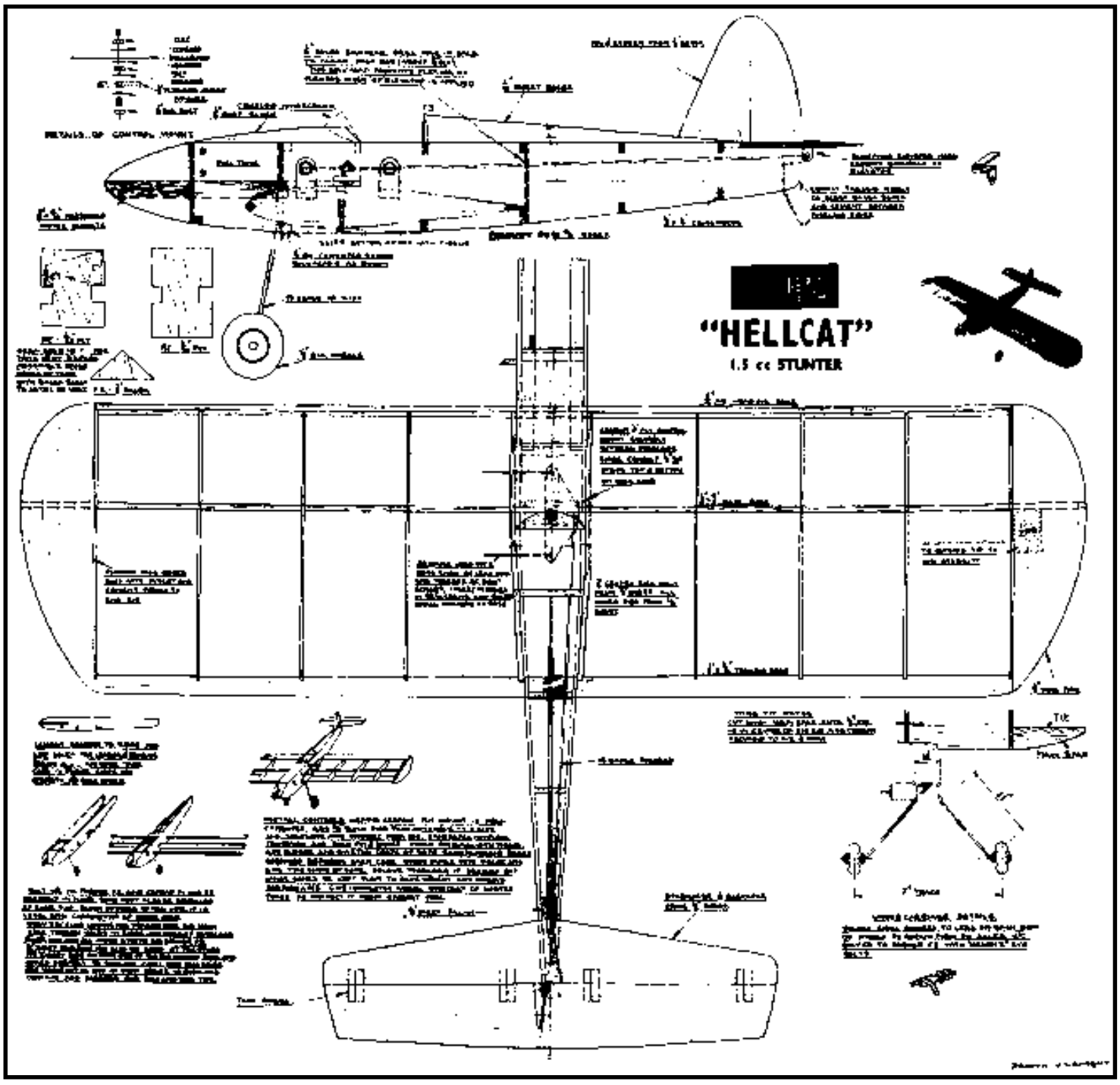
The average commercial design will therefore probably aim a a compromise compression ratio where a relatively inexpensive fuel can be used, i.e., with about 5% nitro-methane. The use of a fuel with a higher proportion of nitromethane will still improve performance, because this is a characteristic of such a dope, but probably at the expense of shortened element life on a standard plug, if this were originally correctly matched to the design. A change of plug to a "hotter" type might well be advisable, or even necessary.

On the other hand, such an engine "hotted up" by the use of a dope fuel will not give as good a performance as a similar size of engine designed initially for peak performance around a particular doped fuel, because its compression ratio is wrong. Its performance with a

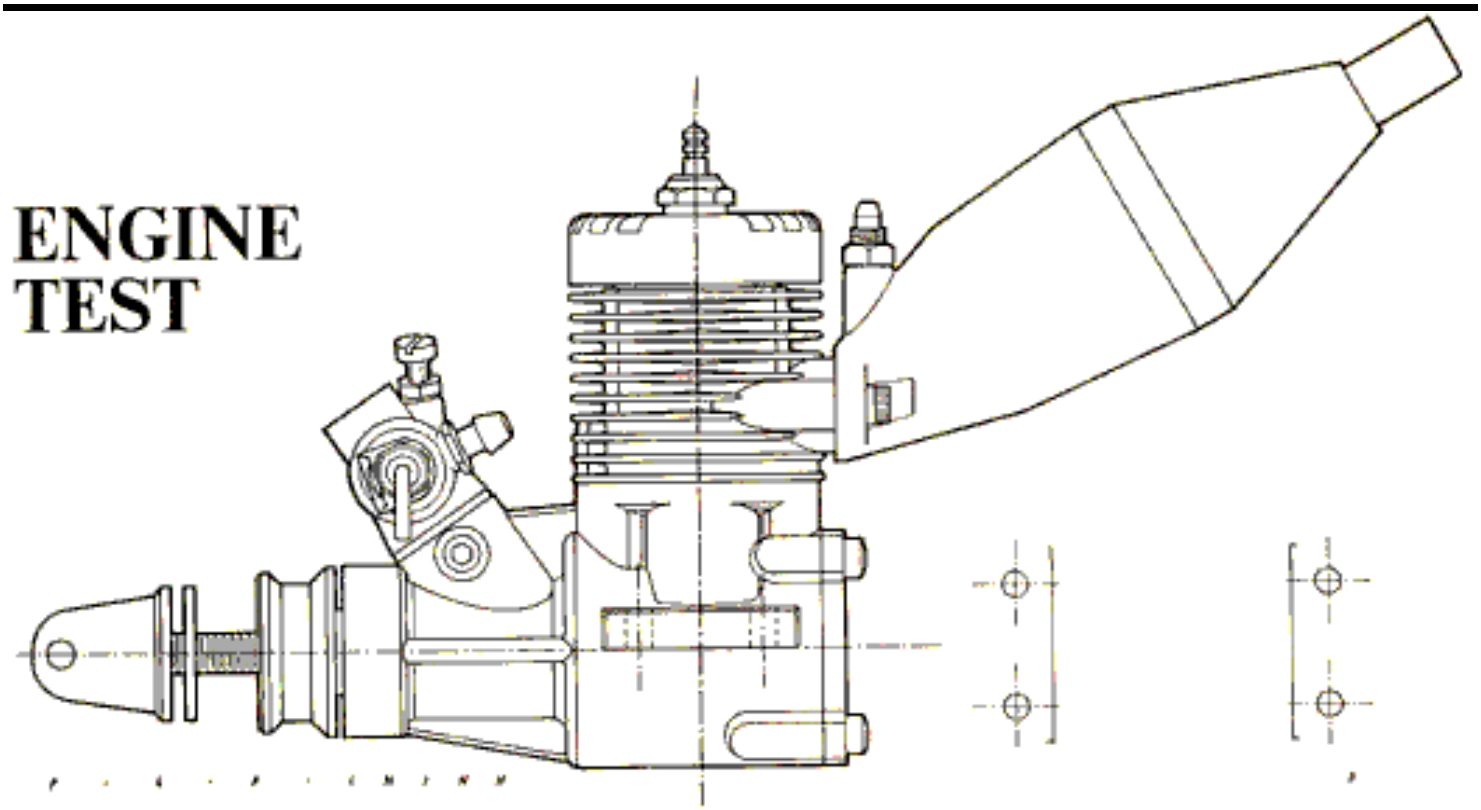
heavily doped fuel could probably be improved by reducing the original compression ratio (e.g., with a short reach plug replacing a long reach one, and thus increasing the actual head volume; or additional gaskets under the head to increase the head volume), although this does not follow as a general rule. The other major factor to be considered is the pumping efficiency, which may well vary with speed. Hence a particular engine may even need an increase in *geometric* compression ratio to compensate for a falling off in pumping efficiency operating at a much higher speed.

Due to the difference in the calorific values of the fuels involved, a glow engine must, inherently develop *less torque* than a diesel, for the same speed. On the other hand the glow engine can, in general, be run up to much higher speeds than a diesel, so that ultimate power output, being the product of torque and speed, can be comparable. But to be truly comparable, or even superior in this respect, virtually means "tailoring" the engine around a particular fuel and, to oversimplify the problem, reduce compression ratio and increase pumping efficiency - in other words maintain the required *effective* compression ratio for the fuel used with the minimum of mechanical losses in so doing.

This normally means that the average glow engine, size for size, will invariably be inferior to its diesel counterpart as regards torque and power output, although it may be capable of running at higher speeds. Top performance from a glow engine can only be got out of a carefully-proportioned design, virtually built around a specific fuel. And although the compression ratio plays a major part in this, assessment of likely performance on the basis of *geometric* compression ratio alone can be most misleading.



ENGINE TEST



TAIPAN 2.5 BR R/C

by Peter Chinn

THE AUSTRALIAN-BUILT Taipan 2·5cc ball-race R/C glowplug engine has the distinction of having recorded the highest brake-horsepower figure of any 2·5cc throttle-equipped engine tested in this series to date.

This motor, featuring Schnuerle scavenging and a rear exhaust, was designed primarily for the 'Quarter Midget' radio-controlled pylon racing class and although a standard non-throttling version is available for free-flight and control-line use, only the R/C version was submitted to us by the manufacturer for test. Nevertheless, the standard version clearly has distinct possibilities for C/L Goodyear racing.

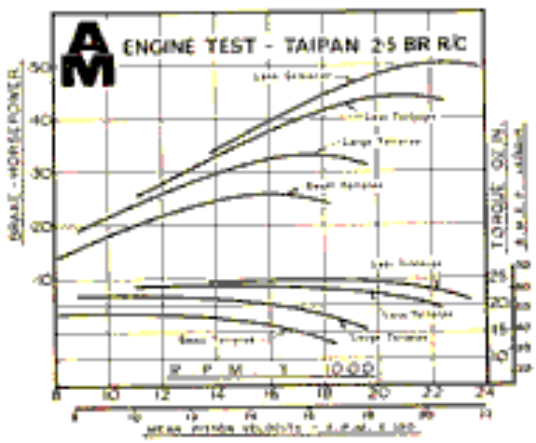
Some modifications have been made to the Taipan since its introduction about 18 months ago. These include minor modifications to the ports and, for 1975, a new backplate moulded in a glass-fibre filled plastic instead of the gravity-cast aluminium backplate formerly used. Other changes include a new crankshaft and a connecting-rod that is bronze bushed at both ends.

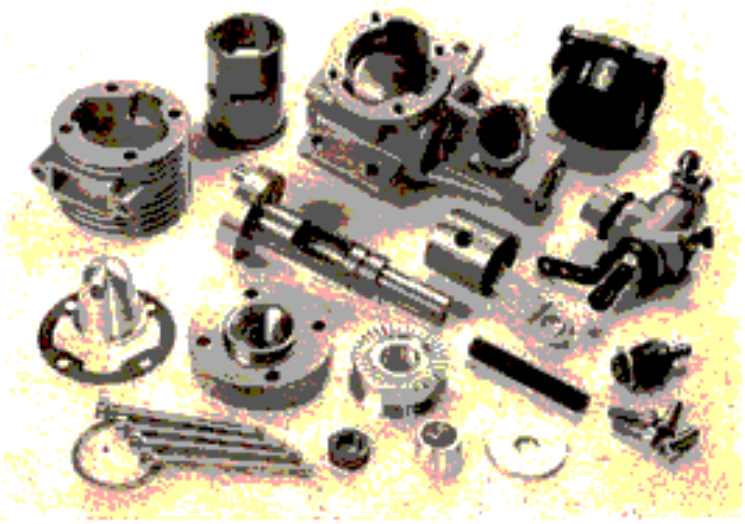
The external appearance of the Taipan 2·5 is quite distinctive and particularly so when the special Taipan silencer made for it is added. This is a closed expansion chamber of a divergent/convergent cone pattern and looks rather like a 'foreshortened tuned-pipe' – if one might be permitted to use such a contradiction in terms as a means of describing it. It bolts directly onto the rear of the cylinder casting and is inclined upwards at an angle of 30°. In theory, its design is good insofar as its location and shape allow expansion of the exhaust gases to take place immediately they leave the exhaust port.

Another good thing about this silencer is that it has provision for adjusting the balance of noise suppression and power absorption through the use of different-sized outlets. The main body of the unit consists of a gravity-cast forward section and a machined rear cone, into which short screw-in interchangeable tailpipes are fitted. Two sizes of tailpipe are supplied: one with an i.d. of 3·5mm and the other with an i.d. of 5·5mm. Alternatively, one can dispense with the tailpipe altogether, increasing the outlet i.d. to approximately 6·8mm.

The silencer has provision for exhaust port priming and an exhaust pressurized fuel system. For the former, there is a right-angled screw-in brass nozzle in the top of the silencer immediately ahead of the exhaust port and, for the latter, there is a screw-in brass nipple on the right-hand side of the silencer body.

The carburettor is of the two-needle automatic mixture control type and has a very generous choke size. Effective choke area, after allowing for the restriction caused by the idle-needle and slightly protruding jet, is approximately 17sq.mm, which is very much larger than that of





the usual 2·5cc R/C engine carburettor.

Other aids to free-breathing are to be seen in the extended induction period (over 200° of crank angle, timed 32° ABCD to 53° ATDC) and the large parallel-sided valve ports (for quick opening and closing) with the fixed port offset in the direction of rotation to promote a tangential gas flow.

Performance

Starting qualities of the Taipan were good and the engine ran freely from the very beginning. After a nominal running-in period of one hour on straight 3 to 1 methanol and castor-oil fuel, a series of test readings were taken using our standard R/C test fuel containing 5 per cent pure nitromethane.

Four sets of readings were recorded for the purpose of this report: (a) with silencer and small tailpipe; (b) with silencer and large tailpipe; (c) with silencer but without tailpipe and (d) with open exhaust, i.e., less silencer.

Restriction of a silencer's outlet area, in the interests of noise suppression, can, if carried too far, spoil a high-performance engine's handling characteristics, as well as seriously affecting its power output.

So far as the Taipan and its silencer are concerned, we feel that the smaller of the two tailpipes, by reducing the outlet area to less than 10sq.mm (40 per cent smaller than the carburettor choke area) is too restrictive. Not only did it almost halve the Taipan's gross (unsilenced) power output and reduce its peaking speed by about 6,000rpm; it also made the engine excessively sensitive to needle-valve adjustment, with very little margin between too-rich and too-lean settings. Admittedly, the degree of silencing obtained was very good, but we feel that the larger tailpipe (25sq.mm) gives an acceptable level of noise suppression, by present standards, while having a much less serious effect on handling and power output.

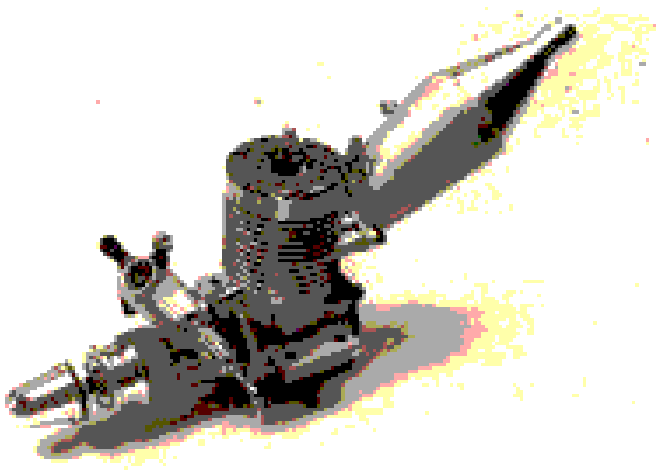
Going one stage further and discarding the tailpipe entirely, enlarges the silencer outlet to approximately 36sq.mm and, with this, the Taipan closely approached the output figures obtained in unsilenced form while within the letter, if not the spirit, of the silencer rule.

To give some idea of how these various size exhaust outlets affect performance, we would mention that, on an 8×4 Taipan nylon-glass-fibre prop, respective full-throttle speeds recorded were: 13,600rpm (small tailpipe); 15,000rpm (large tailpipe); 15,800 rpm (less tailpipe) and 16,000rpm (less silencer).

Considerably greater variations are to be expected when the engine is loaded for higher speeds and this is illustrated by the performance curves. Here, it will be observed that, while the gap between the performance recorded with the small and large tailpipes fitted remained fairly constant, our test motor showed markedly higher top end performance when less restricted, culminating in a peak bhp of 0·44 at 21,000rpm when the tailpipe was discarded and just over 0·50bhp at around 22,500rpm with the complete silencer removed.

It is this figure of 0·50bhp on 5 per cent nitro fuel that established our test model Taipan as just about the most powerful 2·5cc R/C engine tested to date. We obtained a similar figure with the Schnuerle port K&B 15 R/C Series 72, but only when using 25 per cent nitromethane fuel. On the other hand, the K&B developed higher maximum torque, irrespective of fuel used and, as a result, had an ability to pull bigger props. Certainly one should not over-prop the Taipan (in this respect it can, perhaps, be more closely likened to the Super-Tigre G15) and it may well be significant that, in Australia, the fastest Quarter-Midget times have apparently been achieved with props of rather lower nominal pitch than is generally used in this class.

The Taipan 2·5cc BR R/C is not a cheap engine



(current list price is £23·36 or £27·82 with silencer) but it is finely finished inside and out and is strongly made. Examined at the end of our protracted period of test running, it was found to be in excellent condition. Nor is it a plug-cruncher. The Taipan plugs used stood up very well to prolonged periods of running at speeds of up to nearly 24,000rpm.

Power/weight ratio (as tested):

0·55bhp/lb with silencer and small tailpipe.

1·25bhp/lb less silencer.

Specific output (as tested):

105bhp/litre with silencer and small tailpipe.

204bhp/litre less silencer.

SPECIFICATION

Type: Single cylinder, air-cooled glowplug ignition, Schnuerle-scavenged, rear-exhaust, two-stroke, with crankshaft rotary-valve and twin ball-bearings. Throttle type carburettor.

Bore: 16mm (0·6306in.)

Stroke: 14mm (0·5512in.)

Swept volume: 2·474cc (0·151cu. in.)

Stroke/Bore ratio: 0·9:1

Measured nominal compression ratio: 10:1

Checked weights: 182 grammes – 6·4oz. less silencer
213 grammes – 7·5oz. with silencer

GENERAL STRUCTURAL DATA

Gravity diecast aluminium alloy crankcase with integral foot mounting. Counterbalanced crankshaft with 10mm o.d. main journal, 7mm o.d. front journal, 7·1mm i.d. gas passage, pressed-in 4mm dia. solid crankpin and running in ball journal bearings front and rear. Diecast aluminium alloy cylinder-jacket with deep-in cylinder-liner located by flange at top. Machined aluminium alloy finned cylinder-head with gold anodised finish and 0·4mm copper gasket. Complete cylinder assembly fixed to crankcase with four long screws with paper gasket between the two castings. Lapped cast-iron flat crown deflectorless piston with internal annular stiffening rib below gudgeon-pin holes. 4mm o.d. hollow gudgeon-pin retained by wire circlips. Machined aluminium alloy connecting rod, bronze bushed at both ends, with oil hole at big end. Barrel throttle type carburettor incorporating adjustable automatic mixture control via second needle in throttle barrel. Glass-fibre reinforced nylon crankcase-backplate secured with four screws. Machined aluminium alloy prop driver, mounted on shaft via aluminium alloy split taper collet. Separate screw-in prop retaining stud. Conventional steel hexagon nut and optional machined aluminium spinner nut supplied.

TEST CONDITIONS

Running time prior to test: 1 hour.

Fuel used: (i) 25 per cent Newton R castor-oil, 75 per cent methanol (running-in).
(ii) 5 per cent pure nitromethane, 20 per cent Newton R castor-oil, 75 per cent methanol (tests).

Glowplugs used: Taipan long-reach as supplied.

Air temperature: 11°C (52°F).

Barometric pressure: 1005mb (29·7in. Hg.).

Silencer used: Taipan rear expansion chamber as supplied.

Two policemen call their station on the radio.

"Hello. Is that you Sarge?"

"Yes?"

"We have a case here. A woman has shot her husband for stepping on the floor that she had just scrubbed and mopped clean."

"Have you arrested the woman?"

"No sir. The floor is still wet."

Contest Calendar 2018

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 18th / AGM Echuca 8.30am September 16th

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

January 27th & 28th.	**P & DARCS CARDINIA 10 am Start** Saturday: Classic Aerobatics, Vintage Gliders, Fun Fly Sunday: Roy Robinson Trophy Texaco, Duration,--- Mass launch foam gliders
March 17th & 18th.	**ECHUCA** *Saturday:* 1/2A Texaco, Duration, Burford *Sunday:* 8.30am General meeting, Texaco, 38 Antique (Climb & Glide)
March 29th-April 2nd. Easter	**CANOWINDRA - SAM Champs Down Under** SAM 1788 Competition
April 23rd-30th	**70th MAAA AUSTRALIAN NATIONALS - West Wyalong NSW** **http://www.maaaevents.com.au/** 24th ½ A Texaco ---- Standard duration 25th Anzac Day---- Duration 26th Scramble ----Texaco 27th Burford ---- Nostalgia 28th 2CC ---- 38 Antique 29th Old Time Glider
May 5th & 6th	**COHUNA - VIC / SA CHAMPS (yet to be confirmed)** Saturday: 1/2A Texaco, Duration, Burford Sunday : Texaco, 38 Antique
May 19th & 20th	**BALLARAT** (new field) Saturday: 1/2A Texaco, Duration, Burford Sunday: Texaco, 38 Antique, Climb & Glide
Sept 15th & 16th	**ECHUCA** Saturday: 1/2A Texaco, Duration, Burford Sunday:8.30 am AGM meeting, Texaco, 38 Antique (Climb & Glide)
Sept 29th & 30th	**EASTERN STATE GAS CHAMPS - Wangarrata** SAM1788 Contest
Nov 10th & 11th	**COHUNA (yet to be confirmed)** Saturday: 1/2A Texaco, Duration, Burford Sunday: Texaco, 38 Antique { Climb & Glide }
Nov 25th	**BALLARAT (new field)** 1/2A Texaco, Climb & Glide, Texaco