

CONTROL LINES

By Ivars and Maris Dislers

This issue we report on the 1983-84 Australian and New Zealand Nats. We regret that some of the events cannot be properly covered due to the fact that the computer print-out of the results showed no scores while those scores that were recorded were unclear (and that's being kind). I have relied on the results printed in Circle Torque, the REMAC Newsletter and reports and letters where possible. This gripe aside, the feedback I have received on the Nats has been favourable and the Nats committee should be complimented on a job well done. Particular praise has been expressed regarding the excellent practice facilities at the tarmac site and the efficient manner stunt was run. Brian Eather details how to set up a Super Tigre 46 for stunt. This rework will require care but is well within the scope of normal ability. We also show you how to go about converting an Aeroflyte metal tank to an Aeroflyte tank for a more even engine run. The Aeroflyte tanks are the most common type used by Australian flyers, hence our choice; however, the principle could be applied to other commercial tin tanks as well.

1983 - 1984 AUSTRALIAN NATIONALS

FAI Team Race.

Twelve teams took part in the racing which was of a good general standard for Australia. Peter Tilley directed the proceedings well, with no incidents or protests. The smooth tarmac Parade Ground provided an excellent surface with plenty of room for practice. Two teams were noticeably better than the rest. Wilson-Lumsden recorded an excellent 3:45.2 and Georgiadis-Prior showed the act was still there with four good times within 4 seconds of each other. Fitzgerald made the semis (fastest 9 qualifiers) when Turna-Adler withdrew, and made the best of the situation, eventually making the final. The final was a clean race with Wilson-Lumsden quickest at 20.2 to 20.6 for ten laps, but were hurting for range and made two extra pit stops. Fitz-Fitz had an uneventful run with 21.2 to 21.4 airspeed. Georgiadis-Prior, with little chance to practise due to living in different states, had some tuning trouble at one stage which cost them time, and were timed at 21.8 to 22.0. All competitors used Nelson AACs and most used flying wing models.

Results: (12 entries)

Wilson-Lumsden	3:45.2	DNS	3:47.9	DNS	8:03.4
Fitzgerald-Fitz	6:15.5	5:33.4	5:30.0	4:05.6	8:26.6
Georgiadis-Prior	4:00.5	3:56.2	4:00.1	4:03.2	8:29.5
Smith-Thorne	4:22.8	4:12.4	4:22.9	4:09.9	
Nugent-Nugent	4:46.3	4:15.3	4:27.4	4:18.1	
Randall-Lumsden	4:21.6	5:30.4	4:37.5	4:16.6	
Best-Walton	5:06.4	4:29.5	4:41.0	5:14.7	
Turna-Adler	4:50.7	Withdrew			
Hunting-Hunting	4:53.9	DNF	4:35.7	DNF	



Yak entered in Scale. No other details available. Who can tell us more? Middleton photo.

2.5 cc Rat Race

Wilson-Lumsden, using a new model, once again demonstrated their expertise in this event, coming close to setting a new final record, but had a mix-up with one minute to go, involving an extra pit stop. A number of pilots found that they could not keep up a strong whip in the hot conditions, for the whole race. It does seem that more and more pilots see flying in this event as an ordeal. This could explain, in part, the reluctance of those without a masochistic tendency to take part! Shortening the race distance or using the Junior Rat rules, which now require an exposed engine and no whipping, may be a good thing. Equipment has pretty well standardised with Nelson diesels, particularly the steel liner version, and aircraft either a pod and boom full fuselage layout or a flying wing.

Results: (10 entries)

Wilson-Lumsden	Vic	307	DNS	572
Fitzgerald-Fitz	SA	267	281	546
Randall-Lumsden	Vic	278	DNS	535
Hunting-Hunting	Vic	212	273	
Best-Walton	WA	263	33	
Tonkin-Brown	NSW	208	222	

Goodyear

Goodyear has for a number of years been dominated by the racing glows. This trend was again apparent this year. The OPS of Fitzgerald was unusual, making excellent power and speed. To my knowledge this is the only team currently using this motor, and as their 4:00.6 heat time shows it is a competitive choice in the right hands. Turna-Adler had a very quick Mk2 Rossi and Wilson-Lumsden turned in their fastest time with a Nelson 15G. These three teams seemed to have an edge over the rest of the field in terms of airspeed.

Results: (13 entries)

Turna-Adler	4:01.1	DNS	8:32.8
Wilson-Lumsden	4:12.0	4:36.2	9:27.0
Fitzgerald-Fitz	6:03.1	4:00.6	DNF
Justic-Justic	4:27.3	5:33.3	
Snaith-Snaith	4:28.1	4:28.1	
Mattas-Rothwell	DNF	4:33.1	
Bellis-Bellis	5:13.3	DNF	
Bainbridge-Bainb	5:52.8	DNS	
Hunting-Hunting	6:18.2	5:52.9	
Trimmer-Trimmer	5:56.5	Disq.	
Sidaway-Chappell	DNF	6:22.3	

Open Rat Race by John Hunting

Due to the speed of these models they must pass a

Results: (7 entries)

Hunting-Hunting-Sparks	Vic	2:39.4	DNS	5:26.6
Turna-Adler-Bush Chook	WA	3:19.1	2:42.8	8:01.2
Wilson-Lumsden-Nugent	Vic	4:27.6	3:08.6	10:07.3
Yeoman-Frith-Wareham	Vic	2:42.2	DNS	DNF
Brown-Tonkin	NSW	3:32.8	3:59.8	

32G pull test, which resulted in the models of Tilley-Shing and Sidaway-Chappell being damaged, the latter team being unable to compete. When building models for this class, the control system must be designed to withstand a pull test of up to 50G. Obviously, the lighter the model the lower the pull test required. My model weighs in at 26 oz. Some say that this is too light and therefore structurally unsound, however, careful wood selection and other materials in the right place go a long way towards achieving a realistic weight.

The first heat was between Hunting-Hunting-Sparks and Turna-Adler-Bush Chook (Who??). Both teams got away together with airspeed favouring the H-H-S team. The Turna team suffered a blown glow plug at their first pit stop but recorded a reasonable time of 3:19.1. The Hunting team scored a quick 2:39.4 and brother Ken managed to burn his hand on the hot mini pipe exhaust. In the second heat Wilson-Lumsden-Nugent had slowish airspeed and poor stops while Brown-Tonkin had a good run although lacking high airspeed. In the third heat Yeoman Frith-Wareham showed good pit work and recorded another 2:39.4. Tilley-Shing had problems and did not finish. In the second round the Hunting and Yeoman teams elected not to fly as they recorded good enough times in the first round. Turna and Wilson improved on their first round scores.

Following the heats the Contest Director was approached and, for safety reasons, consented to two two-up races to decide the final. (A wise decision in the opinion of those I have spoken to, I.D.) With models circulating at 150 mph, a three-up race could become hazardous!

FINAL 1: The Yeoman team was first away with Hunting and Co. having a reluctant K&B starting rich and having to be retuned, losing some 23 seconds. The Yeoman team made a quick pit stop at 60 laps but by 88 laps the Hunting team, circulating at 1.5 seconds per 7 laps quicker than the Yeoman team, had made up their deficit of the slow start. All of a sudden the OS lost airspeed with a sick sound, the shut-off was activated and the model brought down where the pitmen discovered a broken ring. So ended Yeoman's chance of recording a time. The Hunting team went on to record a time of 5 min. 26.6 seconds, which turned out to be the best final time. In FINAL 2, both the Turna and Wilson teams had problems and their times of 8:01.2 and 10:07.3 reflect this.



Doug Grinham (Vic), 8th place in FAI Aerobatics. Smart dark green and white. Middleton photo.

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Mouse Race

Mouse Race is not one of the events normally held at a Nats but was included in the program this year. It was run to the NSW rules; i.e. 35 foot line length, 10 minute heat and 20 minute final with a 10 minute final if all agree and whipping is allowed. The Cox TD 049 was the dominant motor as expected, and equipment ranged from a fully cowelled model of mine that Fitzgerald-Fitzgerald fixed up for the occasion to the uncomplicated sidewinder. The eventual winners, Snaith and Snaith used an unusual upright layout (see photo). Here is **Joe Snaith's** account of the action.

This year at the Nats the Mouse final was fought out between Fitz-Fitz, Hunting-Hunting and Snaith-Snaith. It featured the most aggressive flying I have ever seen in any racing event, with no quarter asked or given. My pilot, David, had never swapped handles and flown left-handed before, because, at 6 foot 3 inches, he had never needed to! He had to learn fast! In the latter stages of the race the mishap which everyone was expecting, happened. Hunting and Fitzgerald clipped each other and Hunting's model crashed. The remains charged around the circle in ever decreasing circles as it wound its lines around the legs of Fitzgerald and Snaith, eventually immobilising them. Fortunately for us our mouse is fitted with a cut-out and we were able to land safely. Continuous looping while someone cuts you free with wire cutters tends to be rather difficult with a mouse. The unscheduled delay while the pilots were released accounts for the low lap count!

Results: (8 entries)

Snaith-Snaith	NSW	264	DNS	255
Fitzgerald-Fitz	SA	46	253	201
Hunting-Hunting	Vic	292	DNS	DNF
Wareham-Frith	Vic	174	230	
Justic-Justic	NSW	DNF	203	
Murray-	NSW	144	132	

Mini Goodyear

Mini Goodyear had only eight entries and three of these failed to post a time. The three NSW teams had little experience with the PAW diesel Mini Goodyears as their local rules for Mini Goodyear use .049s. This inexperience was reflected in the results. Ivor F had converted a Sesqui to a plain bearing configuration for the event while Hunting-Hunting were reported to be using a Sparks modified PAW.



The irrepressible Ivor F. flew this CL plane fitted with floats at the Nats. He attempted a touch-and-go using a U-REELY CL handle; he wound it in as he flew it in an attempt to touch it and let it go again. Alas, control was difficult on 5 foot lines and it ploughed into the water!



Kiwi Nationals FAI Team Race finalists. Brothers Gordon and Doug Palmer (won last year but were disqualified for oversize tank), Don Robinson and Bill Pepper from New Plymouth, the Jolly Red Giant from Kaiapoi, Big Trev Henderson, and pilot Dave Bolton from New Plymouth. A great final. Corfield photo.

Results: (8 entries)

Lumsden-Lumsden	4:24.8	DNS	8:53.3
Hunting-Hunting	4:36.1	5:07.5	9:31.8
Wareham-Frith	5:39.7	5:50.7	11:46.4
Randal-Wilson	6:33.2	DNS	
Bainbridge-	7:52.1	DNF	

1/2 A Team Race: (7 entries)

Lumsden-Randall	4:21.6	DNF	8:48.62
Hunting-Hunting	4:45.0	4:12.0	8:48.97
Wilson-Lumsden	4:22.2	4:22.8	DNF
Fitzgerald-Fitz	4:49.2	4:34.6	

Junior 2.5cc Rat Race

R. Lumsden	Vic	514
D. Bainbridge	NSW	327
C. Hart	NSW	40

Junior FAI Combat

1st: Andrew Heath, Mini Boomerang, Thunder Tiger 15.
2nd: Scott Hanson. 3rd: Graham Barnes.

Scale.

Max Newnham	15340	17710	33050
John Farmer	17490	14405	31895
Richard Gibbs	17470	8495	25965
Walter Schubach	13760	11265	25025
Ray Ogle	12000	10135	22135
Craig Yeoman	6690	13035	19755
Gary Sunderland	13350	5935	19285
Ernie Holden	1176	0	1176

F2B. F.A.I. Aerobatics: (20 entries).

Total best two rounds

Reg Towell	6139
Brian Eather	6000
Paul Turner	5966
Frank Battam	5645
John Tidey	5601
Craig Yeoman	5474
Russell Bond	5422
Doug Grinham	5268
Nico Van Zijp	5238
Rob Fitzgerald	5115

F.A.I. Combat (F2D)

1. N. Van Zijp
2. G. Barnes
3. M. Cominskey

Seaplane

Ray Ogle	753
Ivor F	643
J. McFall	538

Junior FAI Aerobatics

Best 2 rounds

Glenn Mitchell	4080
Brian Gardner	3010
Raymond Chappell	2611

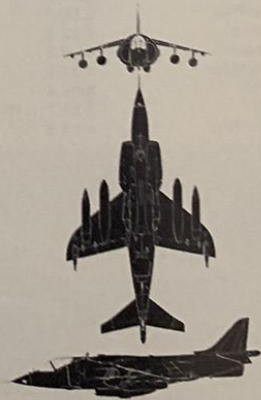
Jet Speed

Jet speed was held at the tarmac site. Most units were Dyna Jets from the USA, except one, Gary Turna's Zanon Jet from Italy. This unit is about twice the

Ballarat & Victoria's Western District Model Shop

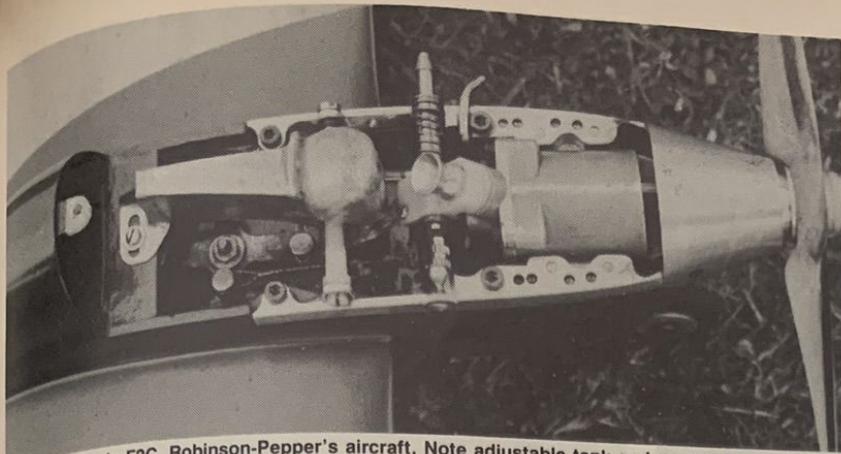
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NZ Nats winner in F2C. Robinson-Pepper's aircraft. Note adjustable tank and neat bellcrank, Robin Boys prop and immaculate workmanship. You need to get it all together in F2C! Photo from Phil Corfield.

size of the Dyna Jet and seems to be harder to set up. When the unit fired briefly the sound was awesome, to say the least. This unit is capable of 350 kph, so watch out boys! David Axon had the fastest of the Jets but trimming problems on the Hot Canary model prevented him from setting an official time. Ivor F broke the tail on take off which ended his chances. While Fred Adler and Craig Yeoman had the most reliable units they were certainly not operating at maximum potential. Craig's speed was 189 kph and Fred had 180 kph.

AUSTRALIAN TEAM FOR 1984 WORLD CHAMPS

The following people have indicated their intention to represent Australia at the next Control Line World Champs at Chicopee, Massachusetts, USA. I am sure the readers will join Control Lines in wishing them success.

- Combat:** Bruce Bellis, Richard Bellis, Garry Turna.
- Speed:** Andy Kerr.
- Team Race:** Rob Fitzgerald-Maris Dislers; Dave Smith-Robert Thorne.
- Aerobatics:** Brian Eather, Jeff Reeves, Craig Yeoman

AEROBATICS - THE SUPER TIGRE 46 STUNT ENGINE.

by **Brian Eather**
The Super Tigre 46 is quite old, both chronologically and in its design. It is the only G series Super Tigre remaining in production and is based on the 29 crankcase but with increased bore and stroke resulting in a very light 46 engine. This engine has been, and probably still is, the best stunt engine available today. At around \$60 it is very good value. A good example has all the desired qualities for a stunt

engine: it produces good torque, is easy to tune and produces consistent running characteristics.

Before running the engine it should be dismantled and cleaned to remove any foreign materials. To remove the liner, heat the engine in an oven at about 200°C for about 5 minutes. Push the liner out from the bottom through the backplate opening with a piece of hardwood. Do **not** grip the liner with any tools as this may distort it. The gudgeon pin is withdrawn through the screw hole in the back of the crankcase. For this I use a piece of 20 gauge piano wire with a small S bend in it. Adjust the bend so that it is a push fit in the gudgeon pin and withdraw the wire with the pin attached to it. Remove the ring from the piston by expanding both ends of the ring. I do this with a pin inserted into the ring groove under each end of the ring. Once expanded, the ends of the ring can be hooked with my thumbnails and the ring slid off the piston.

The ring seal is now checked. Carefully insert the ring into the bottom of the liner (do not use oil) and slide it up the liner, with the skirt of the piston, to about 6 mm from the top. Hold the liner up to a bright light and check for any light passing between the ring and liner. If no light is visible, the ring seal should be OK. If light is visible, the ring should be lapped. I do this using a chromed 46 liner, fine valve grinding paste and two pieces of round hardwood turned to a few thou smaller than the bore and faced off square at the ends. A thin film of paste is smeared inside the liner, the ring is inserted from the bottom and squeezed between thumb and forefinger with the wooden rods, one in

CONTROL LINES

each end of the liner. While squeezing the rods to hold the ring square in the bore, use the other hand to slide the liner back and forth using a twisting action. After a few strokes, remove the ring, wash it in solvent and slide it back into the new liner and check for light as before. Continue this process until no light is visible.

Whether the ring is lapped or not it is now checked for end gap. Insert the ring into the liner to about 8 mm from the top of the liner as before and check the gap with a feeler gauge. A 5 to 6 thou gap is required. File the gap with a flat needle file squeezed between the ends of the ring. Continue this process until the right gap is achieved. Select the surface with the best finish and lap it on a piece of glass with a fine cutting compound to remove any machine marks. Sometimes 600 wet and dry paper (stuck to the glass with water) should be used first if the ring has poorly machined surfaces. While the engine is dismantled, the crankcase should be drilled to take an Enya or OS spray bar.

After thoroughly washing all the parts in solvent the engine is ready for assembly. I usually do not remove the ball races unless there is obviously a problem with them. Expand the ring between the thumbs and slide on to the piston from the top. Be sure to face down the lapped face to ensure a good seal in the bottom of the ring groove. Rotate the ring in the groove to make sure it does not stick. Assemble the engine following the reverse procedure for dismantling. To insert the liner, the crankcase is heated as before. Be sure to have the ports in the correct position - the exhaust are the higher ones (i.e. they open before the transfers). Take care to line up the ends of the transfer ports. Take care when tightening the head and backplate screws: they should be tightened a little at a time in a diagonal sequence to ensure even pressure. Place a few drops of light machine oil in the exhaust port before turning over the engine.

Set up the engine on a test bench and run 500 ml of 4:1 methanol:castor oil fuel through it using a Fox long reach idle bar plug. Give the



David and Goliath? Actually, Alistair Boys and Steve Williams battle it out in Combat. David (Alistair) also flies 1/2A Team Race. Phil Corfield at the New Zealand Nationals, 1984.

CONTROL LINE AIRCRAFT SOCIETY



PROGRAM FOR 1984 SECOND SEMESTER

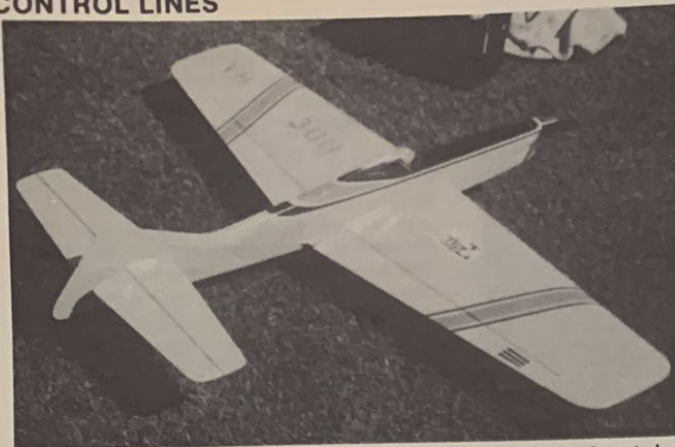
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Paul Turner's Windwedge. Third place in FAI Aerobatics. Another beauty by past Nats champ. Middleton photo.

engine about three minute runs, on a 10x4 prop. The first run may produce some black in the exhaust oil. On each run alternate the needle from a slow to a fast four stroke. Check the temperatures while the engine is running. When it feels hot while at a fast setting, open the needle to a slow setting to allow the engine to cool. Keep alternating the revs in this manner for three minute runs until 500 mls of fuel have been used up.

Fly the engine on your normal flying prop, starting with a rich setting and slowly leaning out each run until the correct setting is achieved in about 4 or 5 flights. A good engine should

hold a steady four stroke, just touching a two stroke above 60 degrees and should not give bursts of power or speed up due to overheating as the flight progresses.

THE LAST LAP

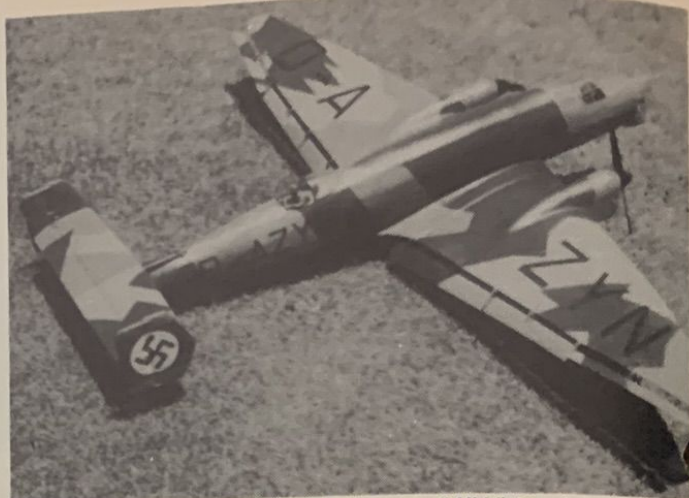
Last issue we ran an article on an easy to build and operate racing model by Frank Coombs, Tissue Trim. Two things I want to comment on. Firstly, it seems the details on whether the plan will be available through AIRBORNE and the price were omitted. Perhaps Merv can include these details in this issue. Further, it occurred to me that one would be hard pressed to find a more suitable design for

the revised Junior Rat specifications requiring an uncwelled motor. *Good Grief! Whatever happened to our little notice?*

Copies of the plan of Tissue Trim are available from AIRBORNE, 11 Cornwall Close, Tullamarine, 3043, for \$5, post free.

BOLLY PROPS

Les Bollenhagen has shifted into his new house, so please send your next prop order to his new address. Les is also working on new props all the time and will even trim and balance your prop for a bit extra if you want this service. His new address is: 11 McKinley St., Elizabeth Downs, SA, 5113.



Junkers 86 entered in Scale. More info wanted! Middleton photo.



At the N.Z. Nats, Dick Willard in foreground fields questions about his famous control line jet Midnight Special. Yes, this is it folks, the jet that Dick flies every New Year's Eve at midnight! Must be one of the greatest (and noisiest) ways of bringing in the New Year. Corfield photo.



Joe Snaith's 1st place Mouse Racer showing hot finger contacts and overflow prime. Total weight - 7.5 oz.; wing area - 45 sq. in.; tail area 14 sq. in.; Cox TD 049; tank capacity - 23 cc; prop - 5x4 own design glass-epoxy. Other wins include 1980 and 1981 NSW State Champs. Snaith photo.

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