Recreational Pilot e-zine
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RAANZ Instructional Techniques Course (ITC)

Easwaran ICEMAN Krishnaswamy/RAANZ President

Greetings members, fellow aviators, RAANZ instructors and particularly RAANZ pilots who are wanting to become instructors in the future. This is an update for both current and prospective instructors.

Section 2.9 of our Policies and Procedures (P&P) manual states all instructors should have completed a RAANZ approved Instructional Techniques Seminar within the first 2 years of holding their instructor rating. This is usually conducted under the sponsoring ATO who issues the instructor rating. We have been working in the background to revamp this instructional techniques course and standardise the syllabus based on CAA Advisory Circular AC61-18.

As the RAANZ instructor pool is spread across the country and are mostly volunteers, we have broken down the course into two parts:

- An online module which gives you ease of access to facilitate learning at an individual's pace. This online module covers the theory of flight instruction. It can be accessed from anywhere with an internet connection and a device (PC, Laptop, Tablet, phone etc.)
- A face-to-face seminar/workshop which covers the practical applications of the theory. This will be facilitated by a trained presenter over a weekend.

All RAANZ Instructors will be required to have this course signed off in their logbooks in due course. There will be a transition period where current instructors will require a refresher of this course and attend the workshop to obtain a sign off in their logbooks. A theory refresher will be required prior to future renewals of instructor ratings. This will be facilitated through the online module. Timing and final dates of implementation/compliance will be announced after the RAANZ executive committee has reviewed the logistics.

We have also been in contact with the CAA of NZ who have reviewed the material and are very supportive of the initiative. Recommended improvements are being revised to fine-tune the course.

The first of the new ITC was conducted at the Canterbury Recreational Aircraft Club. This was attended by 6 instructors and was facilitated by myself. There was good feedback about the course and we are excited to roll it out to the wider RAANZ membership. This effort will, in future, make it easier and quicker for new instructors to gain the skills and knowledge required to instruct and for sponsoring ATO's to facilitate the course.

RAANZ is in the process of rolling out this ITC to the wider membership and requires facilitators to enable delivering of the course to our instructors. If you are interested being a facilitator please get in contact with myself (Easwaran Krishnaswamy).

Canterbury RAANZ instructors attending ITC, Left to Right: Dave Mitchell, Scott James, Tony Denhaan, Doug Anderson, Glenn Martin, Stewart Bufton.

I would like to thank all the ATOs instructors and members who supported the creation of the course.

Special thanks to **Andy Drain** for putting together the online module.

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Rotax 4-stroke survey results

See report appended to this document

New MET services

From 26 June 2018, the GRAFOR (Graphical Aviation Forecast), along with the recently released Graphical NZ SIGWX (GNZSIGWX) chart, will replace the text ARFOR. These changes will swap pages of text with graphics and will provide the same level of information as the current ARFOR, displayed spatially on a map. Wind information will be available in the same format as is currently used, and will be called Aviation Area Winds (AAW). Details are in the pages below.

Weather for Flight Planning

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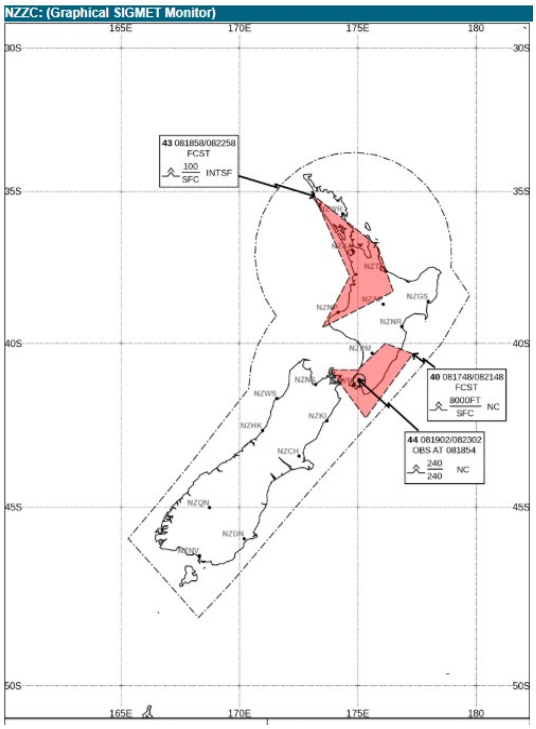
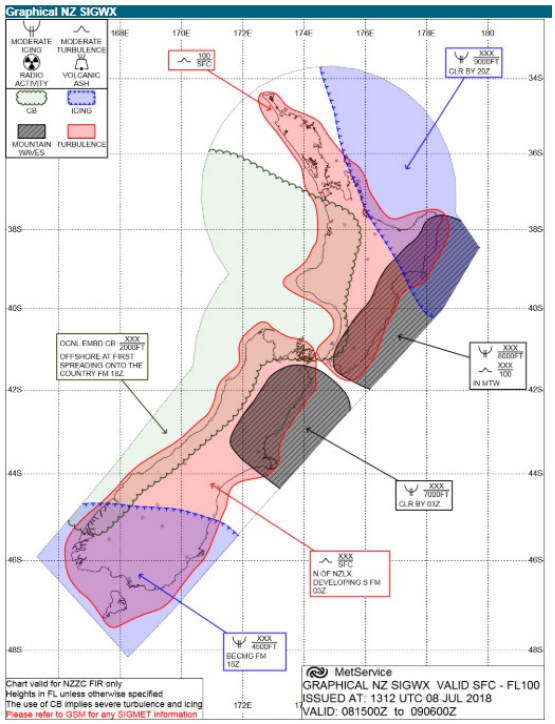
•Weather Information for Your Flight
•How to Access Aviation Weather Information
•How to Interpret Aviation Weather Information
•MetFlight GA - How to Log On
•MetFlight GA Website

It is worth spending some time having a play with these services to get familiar with using them. Soon to be implemented in IFIS Mobile as well.





A good excuse for a club night topic?

Custer Channel-wing: the original upper surface blown STOL aircraft

Membership changes

Garry Belton	NZ Autogyro Association	Senior Flight Instructor	Upgrade
John Issott	Northland Microlight Club	Senior Flight Instructor	Upgrade
John O'Leary	NZ Autogyro Association	Advanced Local	Upgrade
Ashok Abhyankar	Waikato Microlight Club	Advanced Local	Upgrade
Duane Keenan	Associate	Advanced National	Upgrade
Ross Hatfull	Central Hawkes Bay Aero Club	Advanced National	Upgrade
Stephen Butler	Auckland Recreational Microlight Aircraft Club	Advanced Local	Upgrade
Desmond Barry	Geraldine Flying Group	Flight Instructor	Upgrade
Bernard Lewis	Parakai Aviation Club	Advanced Local	Upgrade
Stephen Crowley	Waikato Microlight Club	Advanced Local	Upgrade
Benjamin Dodd	Canterbury Recreational Aircraft Club	Advanced National	Upgrade
Peter McVinnie	Mercury Bay Aero Club	Senior Flight Instructor	Upgrade
Rusell Dickson	Fiordland Aero Club	Novice	Joined
Cara Bosman	Mercury Bay Aero Club	Novice	Joined
Dominic Feiler	Waikato Microlight Club	Advanced National	Upgrade
Hamish Barrow	Fiordland Aero Club	Novice	Joined
Richard Hanna	Mercury Bay Aero Club	Novice	Joined
Robin Sladen	Canterbury Recreational Aircraft Club	Novice	Joined
Andrew Cronin	Mercury Bay Aero Club	Advanced National	Joined
Neville Stirling	Fiordland Aero Club	Novice	Joined
Samuel Dodd	Canterbury Recreational Aircraft Club	Novice	Joined
Pietro Zugnoni	Canterbury Recreational Aircraft Club	Novice	Joined
Ross Martin	Stratford Sport Fliers Club	Advanced National	Joined
Kevin Hanna	Canterbury Recreational Aircraft Club	Advanced National	Joined
Ali Shokri	Waikato Microlight Club	Novice	Joined
Jasmine Ward	Canterbury Recreational Aircraft Club	Novice	Joined
Philipp Henne	Mercury Bay Aero Club	Novice	Joined
Martyn Burgess	Feilding Flying Club	Novice	Joined
John McLelland	Canterbury Recreational Aircraft Club	Advanced National	Joined
Celroy Mascarenhas	Bay of Islands Aero Club	Senior Flight Instructor	Joined
Daneva Quinto	Canterbury Recreational Aircraft Club	Novice	Joined

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Rotax 912/914 reliability survey

The fleet

There are 1106 microlights on the CAA aircraft register (211 Class 1, 895 Class 2).
Based on RAANZ stats for annual inspection returns, approximately 50% of these are equipped with a Rotax 4-stroke engine (912/914 family).
This indicates about **550** of the microlight fleet are powered by Rotax 4-strokes.

The survey

RAANZ and SAC together surveyed their members for reliability information on these engines-type, hours TIS, calendar TIS, defects and root cause.

Recreational Aircraft Assn. of New Zealand (Inc.)

Rotax 4-stroke engine reliability survey

RAANZ (Inc), PO Box 15-016, Hamilton 3243

Dear [fullname]

RAANZ are lobbying CAA to relax the Rotax specified calendar limit before TBO to allow low use/low hours engines to run to at least full TIS before major overhaul or replacement.

To do this we need robust fleet reliability statistics.

We have some data on engines **failing** (though that is fairly sparse), but just as important is data on engines **not failing** (which is even more sparse!).

If you own or have owned a 912/914 powered aircarft we would very much appreciate your feedback.

Just click on the **REPLY** button, fill in the form below with relevant information, and **SEND** back to RANZ.

Your return will be de-identified and consolidated into reliability statistics for the entire fleet.

Thanks from the RAANZ Executive!

Aircraft registration	
Engine type	
Total time in service (hours)	
Calender time since installation (years)	
Have you experienced engine failure?	
Failure details (time in service, failure mode, root cause)	
Failure classification	Engine design/installation/handling/maintenance/wear/age/accessory/etc
Any other comments?	

The response

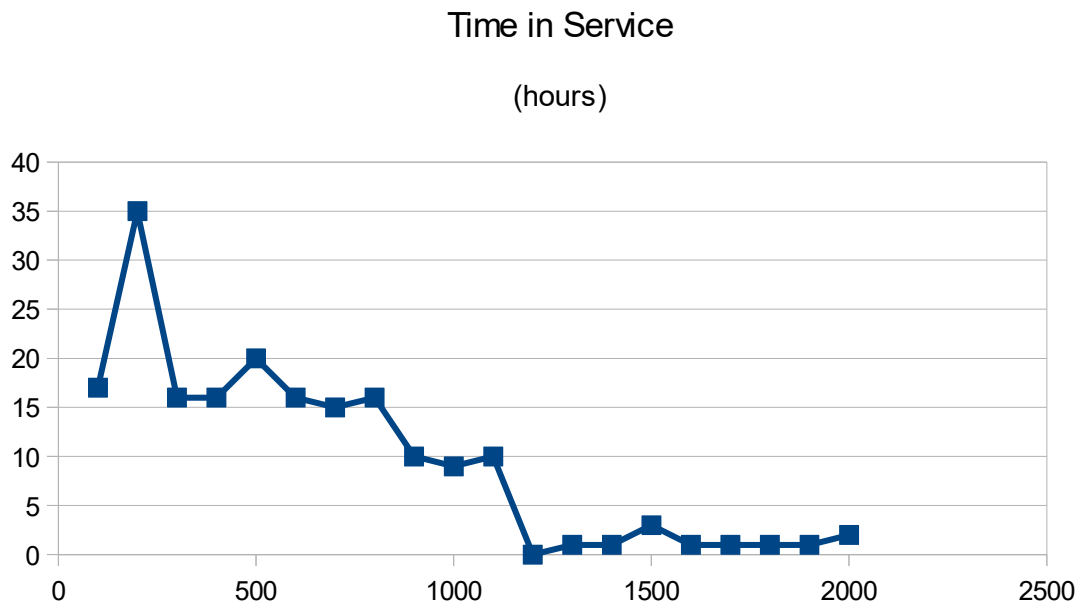
We received **204** individual responses, representing approximately **37%** of the total fleet.
This response gives confidence that the data collected is reasonably representative of the entire fleet.

Fleet TIS (hours)

Total fleet TIS = **102134** hours.

Average TIS = **503** hours.

TIS analysis	Hours	Row number	Aircraft
	100	18	17
	200	53	35
	300	69	16
	400	85	16
	500	105	20
	600	121	16
	700	136	15
	800	152	16
	900	162	10
	1000	171	9
	1100	181	10
	1200	181	0
	1300	182	1
	1400	183	1
	1500	186	3
	1600	187	1
	1700	188	1
	1800	189	1
	1900	190	1
	2000	192	2



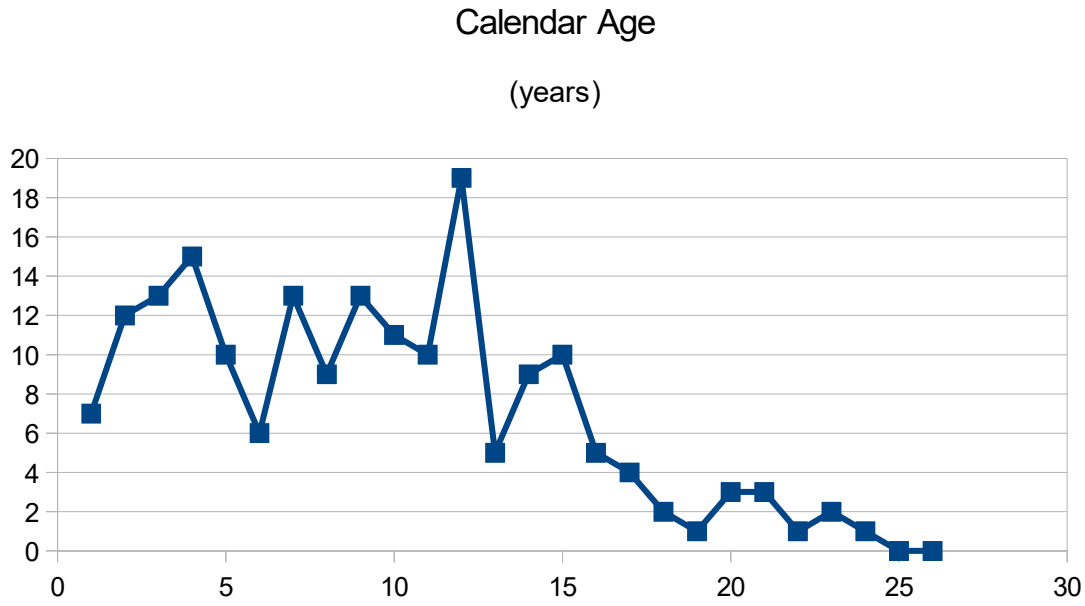
The majority of engines have less than 1000 hours TIS, but a scattering up to 2000 hours.

Fleet age (years)

Total fleet age = 1723 years

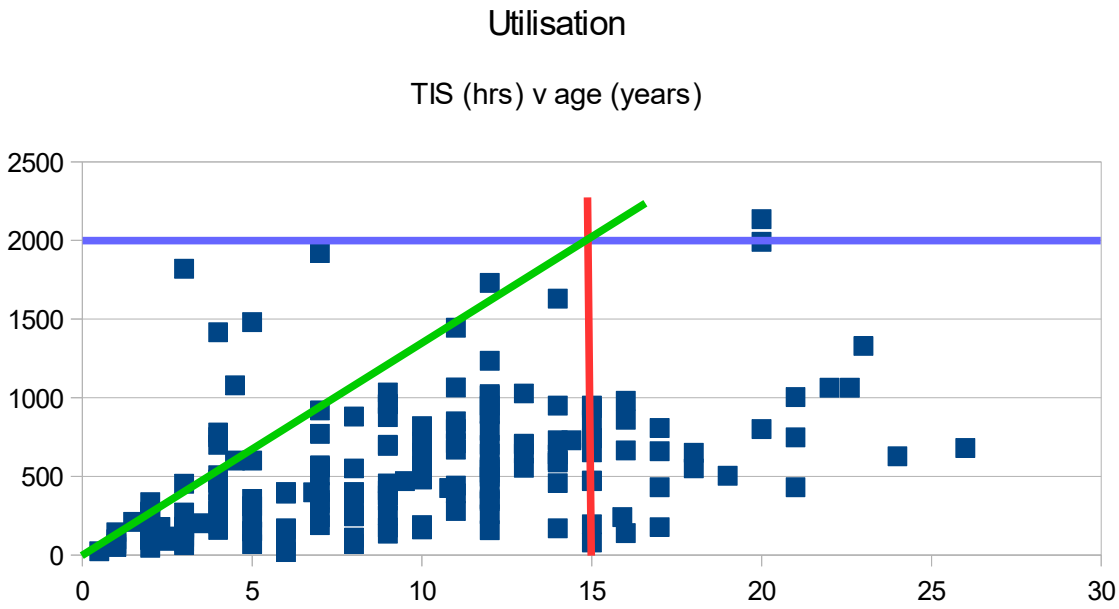
Average age = 8 years

Age analysis	Years	Row number	Aircraft
	1	7	7
	2	19	12
	3	32	13
	4	47	15
	5	57	10
	6	63	6
	7	76	13
	8	85	9
	9	98	13
	10	109	11
	11	119	10
	12	138	19
	13	143	5
	14	152	9
	15	162	10
	16	167	5
	17	171	4
	18	173	2
	19	174	1
	20	177	3
	21	180	3
	22	181	1
	23	183	2
	24	184	1



The majority of engines are less than 15 years old, but still a significant number stretching out to 25 years. But over the next 3 years we will start to see a wave of engines reaching the 15 year recommended limit.

Fleet utilisation

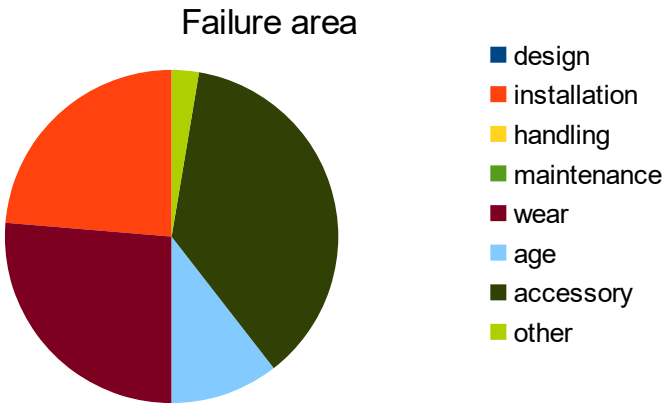


Each plot represents an individual engine TIS v age.
Those above the **blue** horizontal line have exceeded the Rotax recommended 2000 TIS limit.
Those to the right of the **red** vertical line have exceeded the Rotax recommended 15 year age limit.
Those below the **green** diagonal line will likely hit the age limit before reaching the TIS limit.
Note that some of these engines will be early models with lower TIS and calendar limits.

It is evident from these data that because of the typically lower utilisation of private recreational aircraft, most will reach the recommended calendar life limit well before the TIS limit.
We already have a significant number of older low hours engines, with many more coming our way.

Reported defects
There were 38 reported defects.
Based on total fleet TIS this gives a reported defect rate of **37.21/100,000 hours**

Defect analysis			
	design	**0**	
	installation	9	9x carb icing
	handling	0	
	maintenance	0	
	wear	10	3x sprag clutch, 3x inlet valve
	age	4	2x carb diaphragm
	accessory	14	9x ign modules, 4x fuel pump, 3x cap
	other	1	
		38	



The most significant 'weak points' in the engines are **ignition modules** and **mechanical fuel pumps**. The engines have dual ignition- loss of a module will generally be evident on a mag check at run-up, and a single module in-flight failure will result In a slight loss of power.
Most installations have a recommended electric boost pump- failure of the mechanical pump will generally be evident at run-up, and an in-flight failure can be mitigated by selecting the boost pump.
Note that the Rotax Service Bulletin corrected the mechanical fuel pump issue.

We have an anecdotal report of a single in-flight engine failure in New Zealand (not reported in this survey), where the failure mode was a broken banjo bolt on the oil cooler, resulting in loss of oil and catastrophic in-flight engine failure.
There was a similar engine failure in Australia where the oil filler cap was left off, again resulting in loss of oil and catastrophic in-flight engine failure.

The survey data show no sudden catastrophic in-flight failures due to engine wear or age, including those engines well above the recommended TIS and calendar age limits. The defects reported have either been progressive, caught at run-up or routine servicing, or mitigated by duplicated systems.

Maintenance comments

Typical owner reports (including those with 15+ year engines) are that they check and maintain the engines according to the Rotax schedule and wear limits, and are confident the engines can run well beyond the Rotax recommended TIS and calendar limits.

LAMEs maintaining multiple aircraft typically commented that these engines are far more reliable than the older Continental/Lycoming types.