TIGER RAG

NEWSLETTER OF THE TIGER MOTH CLUB OF NEW ZEALAND INC

DECEMBER 2022

MERRY CHRISTMAS MEMBERS

A very Merry Christmas to all Tiger Moth Club of New Zealand members and a best wishes for a great 2023 year
From De Havilland Enterprise December 1950

Technical Notes for Pilots

DE HAVILLAND REVISED ENGINE GROUND & FLIGHT OPERATIONS, ENGINE LONGEVITY

Most of us grey haired pilots were taught to fly Tigers by instructors who were taught by WWII veterans. Dark haired Tiger pilots were taught by instructors up to 3 generations removed from these WWII veterans. The significant change has been that more & more fine details have been forgotten on each passing on, of Chinese whispers (may not be PC nowadays)
One area that has not been forgotten is engine handling on the ground and during take-off and initial climb. Except that what we have been taught has been **wrong** since the close of WWII.
As best that can be determined, the reduce power after take-off and the low 1950 RPM cruise power setting was a 'war emergency fuel economy measure' thus saving precious fuel and allowing more training and combat sorties. The 73 Avgas was also more conducive to this style of operation than current available fuels
The post-war Gipsy Major Handbook 1952 onwards has not been read by pilots and instructors or it's recommended procedures followed, simply because for two factors
1. "This is how it's always been done!" – an oft used aviation term
2. The Gipsy Major Handbook is an engineer's reference manual

Typically the highest Cylinder Head Temperature (CHT) an air cooled piston engine reaches, is at about 300 feet altitude after take-off. This is because we apply full power at zero airspeed, thus the engine is creating the maximum temperatures with no cooling airflow, this excess of heat over ability to cool, continues to accumulate until the aircraft has reached an airspeed that provides an equalizing amount of heat transfer into the cooling airflow. Typically this is at about 60MPH for low powered aircraft, 80 MPH for high powered aircraft
To get around this deficiency of cooling ability during take-off and climb, extra fuel is introduced into the fuel/air mixture to absorb this heat & conduct it out the exhaust system. Any sort of reduced power take off will increase the "Piston Feet Minutes" (and heat) that the engine does before attaining a suitable cooling airflow.
Most of us were taught that after take-off to reduce power by 50 RPM to climb power this was to be done at 20-50 feet (some are taught 200-300ft) The problem with that by reducing power so early in the climb, the mixture is leaned out and causes the CHT to increase even further before an acceptable cooling airflow has had a chance to effectively manage the heat of take-off
The most challenged components of an engine are the exhaust valves and exhaust seats, by leaning the mixture the exhaust valve is then delivered even more searing heat and becomes a candidate for failure sometime shortly in the future. The use of 100LL Avgas and compounds in modern Mogas add to the risk.
The Gipsy Major Series 1 Handbook has the following information in
Chapter 6 Ground running and checks 19. …. When the oil pressure is correct proceed as follows:-
(1) Run the engine at 1,000 -1,200 RPM Selecting the RPM at which the engine runs most smoothly.
Chapter 7 Flight Operation, Climb 11. Climb at full throttle to approximately 1000 ft or for five minutes, whichever takes the shorter time, then throttle back and continue the climb at normal climbing RPM.
Maximum climb RPM is 2,100 for 60 minutes for all Series 1 engines except 1D engines – 1D are not installed in Tigers
Chapter 7 Avoidance Of Spark Plug Fouling: Operating Instructions
1. Avoid over-doping
2. As soon as RPM builds up, open up to 1200 RPM for warming up. Carry on with the run up or taxiing as soon as oil temperature reaches 15deg.
3. During ground running, never idle engines at less than 1,000 RPM except when necessary in taxiing.
In short reducing power after take-off is reducing the climb performance and increasing risk from gusts etc. It also places a greater risk of overheating exhaust valves and valve seats
Yes, fuel is expensive, but failed exhaust valves and reduced time between top overhauls are more so!
This information also applies to other Gipsy Major powered aircraft including Austers
Glenn Thompson LAME, IA, CPL (D cat)

Photo review of 2022 These pics were too good to stay hidden in our archive

Masterton March AGM Meet (Photos by Aaron Murphy)

In the sky over Rangitata Island (Photo Aaron Murphy)

And Lastly Taumarunui 2022

ZK-PHZ **Thruxton Jackaroo** **82151**

Photo Omaka Feb 2020

Built by The de Havilland Aircraft Co.Ltd, Hatfield as standard DH 82A Tiger Moth to RAF specs

N6907	20 Jun 1939	RAF 5 MU, Kemble
	20 Jul 1939	RAF 17 E & RFTS, Barton (op by Airwork Ltd)
		Crashed on landing at Barton Moor 19 Aug 1939
	27 Sep 1939	RAF 24 MU, Ternhill repairs
	30 Nov 1939	RAF 4 MU, West Ruislip storage
	16 Jun 1940	RAF 15 MU, Wroughton storage
	17 Dec 1940	RAF Station Flight Church Fenton
	4 Jan 1941	RAF 54 Operational Training Unit, Charterhall
		Involved in fatal accident 22 Jun 41
	26 Jun 1941	Taylorcraft Aeroplanes (England) Ltd, Rearsby repairs
	30 Jul 1941	RAF 4 EFTS, Brough
	3 Aug 1945	RAF 9 MU, Cosford
	30 Jun 1947	RAF Station Flight HQ, Abingdon
	28 May 1948	RAF Station HQ Oakington
	20 Jan 1949	RAE Netheravon
	27 Apr 1950	RAF 33 MU, Lyneham
	29 Jun 1951	RAF 2 School of Recruit Training, Cardington
	29 Mar 1954	RAF 9 MU, Cosford storage awaiting disposal
	18 Aug 1954	W. A. Rollason Ltd, Croydon
G-AOIO	13 Jan 1956	Alan H. Jones, David B. Hart and Henry I. Armstrong, Thruxton
		(t/a The Wiltshire School of Flying)
	11 Dec 1956	The Wiltshire School of Flying Ltd, Thruxton
		conv to 10th Jackaroo 11 Sep 1957 UK cofa 15 Jul 1958
	29 Aug 1958	Blackpool & Fylde Aero Club Ltd, Blackpool
	15 Feb 1963	Jack Bower, Rowland T. Robinson & Jack Carr, Doncaster
	25 May 1964	Air Navigation & Trading Co Ltd, Squires Gate
	19 Oct 1967	Peter R. Harris, Booker
	15 Nov 1971	Mrs Jane Redvers-Higgins, Shoreham.(cofa expired 12 Jan 1972
	29 Nov 1972	Paul A. Gliddon, Newbury don,
		Damaged at Newbury 2 Apr 1973 TF 30 Jun 1973
		stored at Newbury 29 Jun 1974 (cofa lapsed) cancelled 27 Feb 1978
	Exported to Australia “as is” but remained in storage at Berwick	
	2007	John Fisher, Maryborough, Vic. (restoration project).
	Exported to New Zealand Apr 2017	
ZK-PHZ	21 Jan 2020	John Pheasant, Tauranga TF 15 Feb 2020

Tiger Camp 2023

The Wings over Wairarapa airshow is the weekend before our annual fly in and AGM in Balclutha so why not start there, leaving from Masterton on Sunday 26 February 2023 after the airshow, and ending up at Kaikoura.

Sunday 26 February: Masterton - **Kaikoura** (or meet in Kaikoura)
Monday 27 February: Kaikoura - Forest Field - Lake Heron - Omarama - **Wanaka**
Tuesday 28 February: Wanaka - Nokomai - Garston - **Mossburn** or **Wanaka** or **Te Anau**
Wednesday 1 March: Day trip around western Southland.
Some options are Milford, Fiordland, Te Anau, Stewart Island, Mandeville.
Returning to **Mossburn** or **Te Anau** for the evening.
Thursday 2 March: Day trip around central Southland. Mossburn/TeAnau - **Gore**
Friday 3 March: Gore - Waikawa - Catlins - **Balclutha**

Accommodation: There is limited accommodation in Mossburn so we're recommending staying two nights in Wanaka or Te Anau instead. If you'd like to stay in Mossburn please contact the camping ground sooner rather than later. www.mossburncountrypark.co.nz.

Rooms have been held in Balclutha until the end of December 2022. If you have not booked your accommodation for Balclutha please do so soon to avoid missing out as these rooms will be released to the public in the New Year.

Rosebank Lodge http://www.clt-trust.co.nz/rosebank-lodge---balclutha.html
Helensborough Motor Inn https://www.helensboroughmotorinn.co.nz/
Highway Lodge Motel www.highwaylodge.co.nz

Saturday 4 March: **Balclutha**
Sunday 5 March: Balclutha - Ranfurly - **Pukaki**
Monday 6 March: Pukaki - Rangitata Island - Fernside Fields - **Hanmer Springs**
Tuesday 7 March: Hanmer Springs - Omaka - home

Further information including registration forms will come out before Christmas.
Until then, safe flying!

UP AND COMING EVENTS

2023
Reminder to all Tiger Moth owners to register with DH Support, Duxford, UK for the technical data to keep your aircraft compliant

24-26 February 2023 Masterton

Check out the official website @ **https://www.wings.org.nz** for the next Wings Over Wairarapa Airshow to be held at Hood Aerodrome, Masterton

26 February to 3 March Tiger Camp 2023

3-5 March 2023 Balclutha

The AGM and Fly-in of our Tiger Moth Club of New Zealand
Further details soon

5-7 March 2023 Tiger Camp 2023 (Part deux)

7-9 April 2023 Omaka

Details for the next Classic Fighters Airshow at Omaka airfield, Blenheim are available on their website**:**
https:/www.classicfighters.co.nz

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29-31 March 2024 Wanaka

For more details check the official website @ **http:/www.warbirdsoverwanaka.com**

CAPTION CONTEST

While you are on holiday why not dream up a suitable caption for this photo showing the Lord Mayor of Oxford aboard a DH Moth with pilot Alan Cobham. This is our Christmas caption:

"I say old chap the kids at Hatfield are expecting Father Christmas. They'll never recognise him in that outfit"

The first three cabin Tiger Moths in New Zealand had Canadian built canopies installed for the RNZAF

CANADIAN TIGER MOTHS

Ask any Canadian to choose the best Tiger Moth and don't be surprised if the answer is, the Canadian DH 82C and for good reason. The Canadian machines were fitted with a 140 HP Gipsy 1C, had brakes, a tailwheel, and of course an enclosed cockpit, something the Hatfield and Morris Motors Tigers didn't have. But is was not always like that for back in 1931 de Havilland's were hoping their new Tiger Moth, then with the designation DH 60T, would sell in Canada, and in particular, to the Royal Canadian Air Force. One of the first eight D.H. 60T Tiger Moths was shipped to Toronto where it became CF-APL in September 1931. It was sold to the Toronto Flying Club but the Great depression put paid to further sales.

Four years later, in August 1935 de Havilland's tried again. This time they shipped over one of the latest D.H. 82A Tiger Moths which on arrival was fitted with a cockpit canopy and then tripped around the Dominion on a sales tour. Several were sold to Flying Clubs but the RCAF showed no interest. But de Havilland's did not give up and finally, when they proposed a deal whereby Tiger Moths would be built in Canada modified specifically for RCAF requirements, did they succeed and on 12 March 1937 the RCAF ordered 26 Canadian-built Tiger Moths.

Top of the list of modifications was the enclosed canopy where the frames rolled along runners attached to the outside of the fuselage below the level of the cockpit doors. This gave a wider and more comfortable cockpit but at the cost of a slight deterioration in performance. In addition to the canopy

the RCAF specified a thick rubber crash pad around the instruments plus cockpit heating via a series of pipes connected to a hot-air muff around the exhaust pipe. Plywood leading edges were added to the lower wings for protection as well as wider, plywood-covered, walkways alongside the cockpits to reduce incidents of feet stepping through canvas. The wooden interplane struts were replaced with thinner streamlined steel tubes and the ailerons were mass balanced. Handholds were fitted to the lower wingtips to ease the ground handling in windy conditions while the engine cowls were hinged above the engine along the centre-line for better access. Larger fuel and oil filler necks were fitted and the oil tank was insulated so it did not have to be drained every winter evening. Heavier axles were fitted to take the extra loads when the machines were operated on skis.

On 15 March 1937 the modified British-built Tiger Moth, CF-AVG was accepted by the RCA and then returned to de Havilland's so it could be pulled apart and every component was then used as a master for the production line. The first Canadian-built D.H. 82A Tiger Moth, RCAF 239, was test flown by Phil Garratt on 21 December 1937 and all 25 machines were delivered by 12 April 1939, although two were retained by de Havilland's for development work.

Lee Murray, who had gone back to Hatfield in 1936, returned to Downsview in 1938 with de Havilland's new Chief designer, Ron Bishop. They carried a contract from Hatfield to build 200 Tiger Moth fuselages to ease the pressure on the welding staff at Hatfield. When the first Canadian-built fuselages reached Hatfield just before the outbreak of the Second World War, the Hatfield men found they could not easily match the Canadian fuselages with Hatfield made wings. An urgent report was sent to Downsview listing all the snags that were encountered. The Canadians couldn't understand why those at Hatfield were having problems because each fuselage had been built using drawings supplied by Hatfield. They sent C. D Long to England to show that the components had been built in accordance with the British plans but Long was confronted by an irate group of workers who took delight in showing him that their wings did not fit the Canadian fuselages. How could fuselages built to the same plans end up being different?

The answer was simple. The Canadians used a North American construction system where the welding sequence resulted in a fuselage that exactly matched the plans in contrast to those fuselages built at Hatfield which were built the "de Havilland" way where the parts were welded in a different sequence and the weld to attach the wing attachment lugs was left til last, when the wings were ready to be attached. That way the lugs would always fit the wings. By contrast the lugs on the Canadian fuselages were always in the same place but the sockets on the wings were not. To ease production further shipment of Canadian fuselages was stopped..

Meanwhile in Canada the RCAF had decided their Tiger Moths needed improvements. They wanted battery-powered navigation and signal lights and a pressurised fire extinguisher. They opted for the higher compression and more powerful 140 HP Gipsy Major 1C engines with sodium-cooled exhaust valves which ran on the higher octane leaded fuel then commonplace in Canada.

DH 82A built in UK & fitted with canopy in Canada

Canadian built DH 82C with canopy slid as far back as it would go
Front sliding section goes over the top of the rear cockpit section
Note the undercarriage stance, thinner interplane struts, tailwheel, and mass balance on aileron and elevator.

After Britain declared war on Germany the engineers at Downsview began to strengthen the jigs and tools on the Tiger Moth line, a timely move, for in February 1940, the RCAF ordered 404 Tiger Moths to the new specifications. These DH 82C models had their main wheels set further forward to prevent the aircraft from flipping on to its back when the brakes were applied. The tail skid was replaced by a castoring tailwheel and American instruments were fitted. These were smaller than the British equivalents and gave the instrument panel a more "American" look. The view from the rear cockpit was better because the rear instrument panel was smaller and, for the first time in a Tiger Moth, a control wheel in each cockpit could adjust the elevator trim.

The first production D.H. 82C Tiger Moth, RCAF 4001, was flown on 1 March 1940 and even with the more powerful Gipsy 1C engine it was slower and more sluggish than the DH 82A because of the extra weight of equipment and the drag from the bigger canopy. Production at Downsview increased rapidly just when the supply of Stag Lane built Gipsy Major engines was anything but certain. Still production went on and by 1942 an average of 51 Tiger Moths were built each month.

THE PLAN

Perhaps the greatest flight training organisation ever established was the British Commonwealth Air Training Plan set up on 10 December 1939 with training centres in Australia, Canada, Rhodesia and South Africa. Thousands of pilots, navigators, air gunners, and wireless operators would be trained in the safe skies far from the battle torn skies over Europe and Africa. Canada was central to the Plan, so after initial training in Australia and New Zealand, the aircrew were sent to Canada. This invasion caught the Canadians unprepared and one student recalled that the airfield "was just a field; there were no runways, just a wind sock, and you tried to land into wind as much as possible, always on the look out for other aircraft attempting to do the same as you were."

Winds howled across the wide flat prairies and that made landing Tiger Moths kind of tricky. The ground crew used to drive out on to the airfield in a Chevy truck until they were alongside the landing Tiger. "As soon as that aircraft touched the ground they'd pile out and each man would grab a wing." That's how they prevented the plane from flying backwards.

"At Goderich, when the wind was real strong, the Instructors would fly a square circuit for the simple fact that it could be done. First, a bunch of us guys went out holding the wing of the Tiger Moth and they'd take off at full throttle keeping low along the runway. Keeping the plane horizontal at all times, the Tiger Moth would then climb straight up once it reached the end of the runway, then fly backwards across the field. Once above the other end of the runway, they would reduce the throttle and descend. Finally by pouring on the power they would advance along the runway again until we were able to grab the wingtips as they touched down."

Initially most instructors were Canadians but as the war progressed a number of operational pilots were sent to Canada after they had completed a tour of duty. This was thought to give them a "rest" but many resented the monotony of instructing and training standards were anything but consistent. One trainee recalled that the first thing his instructor (an ex fighter pilot) said was: "Do you want to go low flying?"
"You're damn right!," the student replied.
"Well, don't go low flying unless you tell me. Whenever you get the urge, you tell me, and we'll go low flying. That'll keep you out of trouble."
The student replied: "I want to go now." And that's what they did for 75 hours. They flew low!

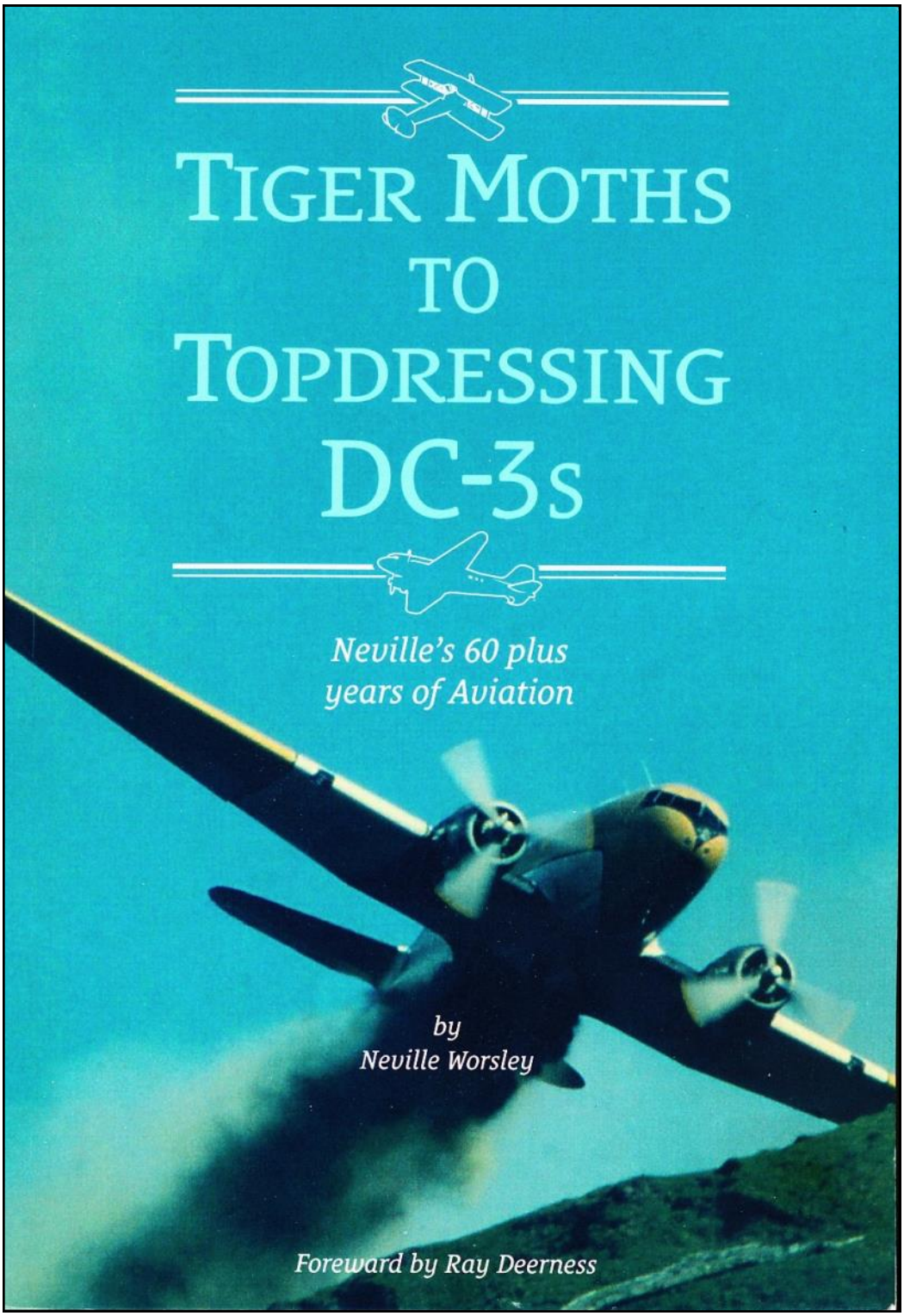
Each flying school had many aircraft which were hangared every night so the ground crew could complete the maintenance checks. One civilian, who helped the pilots park their Tiger Moth in neat lines after they had landed, recalled:

“In those days you had to start the aircraft by hand, and I was mainly a prop swinger, although I did do a lot of maintenance under supervision. All the aircraft had to be refuelled before they were stored in the hangar at the end of the day. The prop usually stopped straight up and down but this did not allow us to store all the aircraft inside because the prop would not fit between the wings of the other aircraft. We had to turn the propellers crossways. One Tiger Moth had just pulled into a gap in the line and I hadn't noticed the engine was still hot. I was just going down the line pulling the props crossways until this one backfired and caught me across the hand. I swore it hit me fifty times before I got my hand outta there, but I guess it only hit me once. I thought my hand was gone for I couldn’t feel a thing. It was just numb and I was afraid to pull the glove off in case I took my right hand off with it!”

Communication with the instructor was through a Gosport tube. One Norwegian trainee recalled: “You spoke into a funnel in front of you by putting it up to your mouth. It was kind of difficult at times, particularly if someone had been sick in the aircraft prior to your flight. The stench was unbelievable so it was natural to open the coupe top about a quarter of an inch or so to get some fresh air. Then you couldn’t hear what the instructor was saying because of the noise”.

In winter the Tiger Moths were put on skis. Even the instructors had to get used to that.
“It was sure hard to taxi. There were no runways, just a field, and all we had to show direction was a half-ton truck facing into the wind. This was fine until the wind changed. The students could land pretty well anywhere on the field and then taxi around the outside. However, when the students went solo, you had to be really careful. Flying on skis was more hazardous. There were no brakes and if they got into deep snow; the Tiger Moth would sink down and we had to get a man on each wing to pull them clear. In really bad cases you had to get a tractor to pull them out. Of course we had to hang onto the wings to guide them to their parking spots.”

On of the biggest advantages of the Canadian-built canopies was that they could be flown either enclosed or open as demonstrated by these two New Plymouth Aero Club machines.



Neville Worsley has written an interesting account of his life flying all manner of aircraft many of them unusual. The bulk of the book is about his days as a topdressing pilot starting with a Piper Super Cub and later flying de Havilland Beavers and the mighty DC-3. It starts with his training on Tiger Moths and gives a particularly clear picture of just what it was like to be a topdressing pilot. Living in small towns, never sure whether it would be a stay at home day or a day practically glued to the controls from dawn to dusk. Yes there were plenty of adventures and they are described in this 220 page book. This is a most enjoyable book to read and backed up with lots of photos covering an era now sadly passed.

For a copy of this book e-mail Neville at dh822dc3@gmail.com or call his cell phone 02102395922.
The price of the book is $70.00 plus postage which works out about $7.50 Rural delivery is extra .

Better still why not buy your copy direct from Neville at the Taumarunui Fly-in. That way you can meet the author, if you haven't already done so, get him to autograph your copy, and save on postage.

Tiger Moth Club Official Merchandise

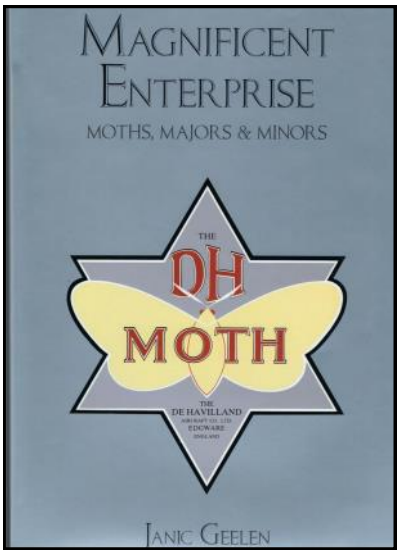
Lightweight Denim Blue Shirt 2017 Safari
was $75 now $ 50.00

Round neck T-shirt
Men and Ladies Fleece Vests
now only $ 35.00

Adult Gold and Blue Polo SPF 50 polo shirt
now only $ 35.00

Adult Blue polo **was $40 now $ 25.00**

Kids Blue Polo **$ 25.00**



MOTHS, MAJORS & MINORS by Janic Geelen
One of the finest books about the golden years of de Havilland. Full page 3-view drawings, accurate gen on all the Moths, Dragons and other 1930s designs. Includes the engines, propellers and racing successes. Hardbound. 214 photos; 56 Three-view drawings
Now $ 35.00

TMC 50 th Anniversary
Metal Badge **$ 7.00**

still available
Standard TMC Metal Badge **$ 10.00**

BUY SELL & OTHER USEFUL DATA

TIGER RAG PUBLICATON DATES

20 February as lead in for Balclutha AGM

PS: I will not be attending the AGM at Balclutha so please submit any material for the post AGM issue to Janic
e-mail: janic_g@yahoo.com

15 April is deadline for post Balclutha issue

10 October for pre-Taumarunui issue

WANTED TO BUY—TIGER MOTH
Contact Carl @ 021500737.

Fantastic opportunity to own one of just a few de Havilland Fox Moths currently flyable in the world

ZK-AQB IS FOR SALE

AQB (Serial #FM49) is one of 51 built by de Havilland Aircraft, Canada in1946 arriving in New Zealand in 1947. It was assembled and sold to the Auckland Aero Club embarking on an interesting flying history until 1972 when it crashed just off Motiti Island.
The wreckage changed hands a few times, finally ending up with Colin Smith and his team at the Croydon Aircraft Company, Mandeville where it was rebuilt it to it's present pristine standard. No expense was spared in bringing AQB up to a standard that could be considered the best in the world.
AQB is currently in the safe care of the Croydon Aviation Heritage Centre, Mandeville, New Zealand
Further photos and details available to serious enquirers: email dantyrrell@mail.com

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