RAANZ

Recreational Pilot e-zine

Issue 115
February 2017

Belated happy new year.

Rodger Ward/RAANZ Pres 0274932943

I hope the new year is treating you ok and you are managing to spend some quality time at the airfield and even better if you have been able to get some air between you and the ground. I have been unfortunate in that the aircraft I have an interest in have had short term problems which have meant they cant fly Λ But I am very fortunate that my local club have a couple of very nice aircraft at very good rates so I have still been able to fly.

My articles have maybe rambled on a bit but they all have revolved around some common themes. I thought it may be worthwhile summarising these.

- We do have one if not the best Microlight operating frameworks in the world.
  It is a privilege not a right and needs to be treated with respect.
- Our procedures have been fine-tuned to make them as simple as possible while at the same time complying with all appropriate rules and practices. Please do not try and shortcut anything.
- There is a lot of new technology out there. Sure use it if you can. Do not rely on it and make sure you do all the basic stuff competently first.
- **OLOC** (**O**verload **L**oss **o**f **C**ognition) is very real. Ie there is just so much data coming that you lose the ability to process any of it. Keep it as simple as you can.
- Nobody is perfect.
- We are all learning. One of the best ways to learn is by osmosis. Just being around, listening and watching is very good. Spend some time at the local club with a coffee with like minded people. Priceless.
- Our club based structure is excellent for mentoring and stopping small problems before they become big ones.
- RAANZ is a big team with every member having value acting towards a common goal. Do not be afraid to offer input or help out where ever you think you can.
- Listen to advice or feedback if it is given and do not hesitate to give it if you think it is needed.
- There are **No** dumb questions. If you are unsure about anything please put your hand up and ask.
- **Airmanship** is alive and well. It is the combination of all those individual skills that you must master to become a respected and competent aviator.
-

That probably covers it for a while.

Enjoy your flying and I look forward to seeing you at an airfield somewhere and at the National Flyin at Rangiora.

RAANZ 2017 National Fly-in

Canterbury Recreational Aircraft Club

Rangiora Airfield

Mar 31- April 2 2017

Friday 31st March

- Meet at Rangiora
- Free flying
- BBQ Tea-$15
- Fly to pier and Sumner or Landing comp.

Saturday 1st April

- Breakfast at clubhouse 7.00am - $10
- Fly to Oxford for lunch via Forrest field and Rakaia Gorge to Lake Coleridge – Oxford. $10

Afternoon

- General flying and competitions
- Dinner at RSA Rangiora- self funded

Sunday 2nd April

- Breakfast at clubhouse. $10

Notes

- Camping at Rangiora with club facilities for use.
- Up to 20 sleeping places at clubhouse.
- Motels in Rangiora, only 7 minutes away.
- Aircraft parking but no hangars are available.
- We are talking to Council about landing fees and think they will be minimal.

Please check NOTAMs as South side of runway 07-025 is closed.

Mercury Bay Aero Club Fly-In

February 11, 2017

starting at 10 a.m.

WALLY ANDERSON, FOUNDER OF SYNERGY AIR, OREGON, USA, ON HAND TO TALK ABOUT BUILDING YOUR OWN VANS RV AND ENJOY FLYING IT FOR YEARS

Wally believes that most people can realise the dream of building and flying their own Vans RV aircraft. Wally will talk about tricks and tips that can save both time and money and make the job turn out really well, particularly when working with fibreglass which can intimidate most people. He will also share information about great tools that are available and demonstrate how to use them and how connecting to a support group can be very helpful.

The Aero Club Cafe will be open for food and refreshments

Please get in touch with me or the organiser, Jim Evans on jevans@ihug.co.nz if you have any questions.

RAANZ Inc
Freepost 102829
PO Box 15016, Hamilton 3243
office@raanz.org.nz
07 825 2800

Microlight Incident Report

IRP No: 1484178616

Name [redacted] Phone [redacted] email [redacted]

The information above will NOT be published. It will only be used by RAANZ if we are not clear about anything in the report.
Please provide as much information as possible- photos, diagrams, etc

☐ **Check this box if you agree to the information below being published**

Incident Details

Microlight type/model	Autogyro MTO3
Place of incident	Tauranga
Other aircraft involved	
Describe the incident	During Pre-rotation in a strong gusty wind I allowed the rotor disc to tilt back too quickly and the rotor flapped and struck the propeller and the tip of the rudder. No injuries or other damage. The aircraft was pushed clear and returned to the hangar for repair.
Describe the affect on safety	safety issues affecting you or others
Remedial action taken	Thorough check of rotor assembly by LAME. New propeller fitted, rudder repaired.
Corrective or preventive action recommendations	I have rewritten our guidance on this subject emphasising the relationship between rotor speed and the amount of airflow the disk can accept, hopefully I will take note in future!

Gyro Rotor Control

Tony Unwin/Gyrate

Rotors have a huge amount of energy in them when they are flying, 10 tons of centrifugal force and 300 mph tip speeds. Out of control this energy can destroy your aircraft and your wallet!

If you have watched modern sailplanes (gliders) on take-off you may have noticed the flexing of the long fibreglass wings as they bounce along a grass runway. In due course as the machine is accelerated aerodynamics come into play and the lift generated by airflow over the wing causes the tips to rise upward and the flexing settles down to almost zero as the aircraft becomes airborne. Glider pilots work hard to keep the wings from contacting the ground during take-off and landing.

For gyroplane pilots contacting the ground or the aircraft with the rotors during take-off or landing is dramatic. We have seen too often the expensive results of poor rotor management. Static rotors although aerodynamically shaped are no more than flexible aluminium (or fibreglass) planks until they start to generate lift. At this stage the blade tips bend upwards and create a coned disk which has stability, rigidity and ENERGY!

The rule is clear, whenever the rotors are static or moving below 100rpm they must be tilted fully forward with an almost zero angle of attack. (The angle between the chord line and the relative airflow). Above 100rpm each individual rotor blade becomes invisible, they blur into a shadowy disc. ***In general terms if you can see an individual rotor blade turning above your head the stick must be held fully forward.***

Once you can see only a blurry disc then the pre-rotator can be released and the stick can come fully back letting the wind blow into the disc, create aerodynamic lift and accelerate the rotor-speed. A little wind or slow forward aircraft movement will sustain rotor momentum.
If for any reason the rotors slow below 100rpm the stick must go fully forward!

Smooth increase in airflow, either by a strong wind or slow, smooth aircraft acceleration will increase the airflow over the aerofoil shape of the rotor-blades and hence increase rotor rpm. In extremely windy conditions it may be necessary not to bring the stick fully aft until some incoming air has increased the rotor speed well above the basic 100rpm. **For a given rotor speed there is a physical limit as to how much air the rotating blades can turn into lift without causing the break-up of the airflow over the aerofoil. Do not accelerate too quickly!**

Should loss of smooth airflow occur then the blades will stall, flap, flex violently and shake the stick wildly. To regain control the pilot must close the throttle and firmly and forcibly move the control column fully forward to reduce the airflow into the disk. In a take-off situation the break- up of smooth airflow can be caused by a pilot accelerating the aircraft too quickly before the rotors have increased sufficiently in speed.

Training in rotor management is a fundamental part of learning to operate a gyroplane. But to précis, if you can see an individual rotor then the rotor speed is below 100rpm and the stick must be fully forward. Having reached more than 100rpm to accelerate for take-off the stick is fully back until the aircraft nose lifts, on landing the stick comes fully back until the aircraft stops and then goes fully forward and into wind to allow the rotors to slow down and stop.

Rubbish Radios

Martin Little/MBAC

I suspect we have all heard position reports from some pilots who seem to have stuffed a Mars bar in their mouths before pushing the transmit button. I don't believe that any sane pilot would continue flying with a radio that cannot transmit properly so what is going on?

Here's my theory for what it's worth.

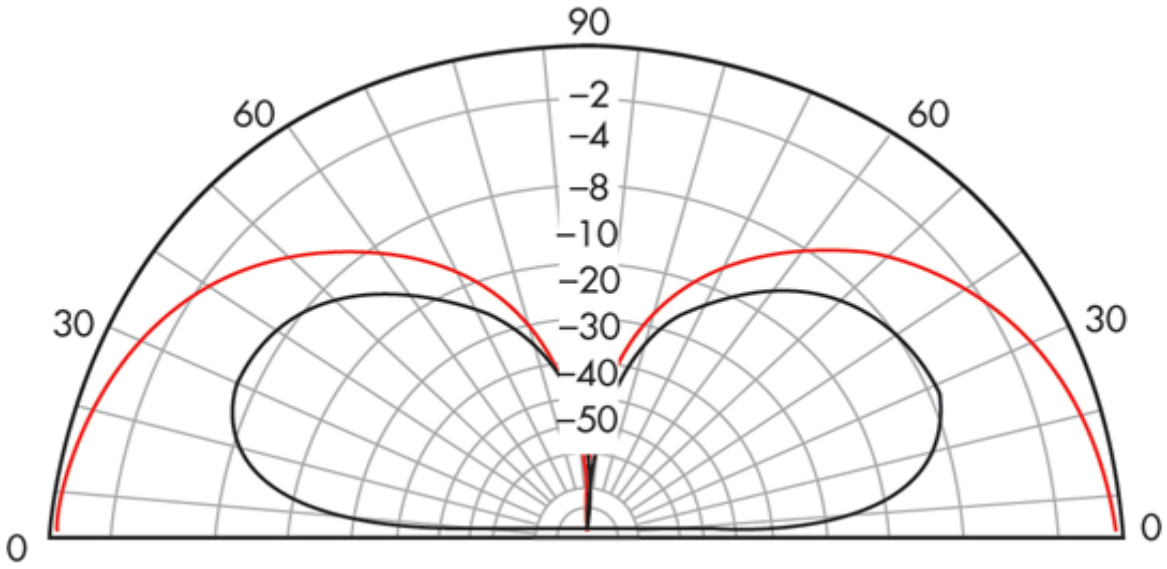
The engineers at Icom (& others) are not stupid or incompetent so we can assume that the radio itself is OK (unless there is smoke coming from it). The radio's sensitivity is such that receiving is seldom a problem – it is **transmit** where the trouble lies.

The radio expects to see an impedance of 50 ohms in order to transmit the maximum power. This is done by using high quality 50 ohm coaxial cable with quality connectors on either end. Having got all the power to the far end of the cable we now come to the antenna.

At aircraft band frequencies the wavelength is about 2.4m and the usual antenna is a whip type of ¼ wavelength (approximately 600mm). With good connections and a secure ground plane the antenna presents an impedance of 50 ohms to the coax and so all the power now goes into the antennae.

So far so good.

The radiation pattern of a **¼ wave vertical whip** is as shown below.



RED- Ideal ground plane. BLACK- typical ground plane

Note how it is strongest in the horizontal plane and weakest in the vertical direction. This is good as our signal wings it's way (pardon the pun) to the horizon with ease but is weak directly above and below. [our altitude is measured in feet but horizontal separation is measured in miles].

At this point, if I now told you to bend your straight (vertical) whip into a coat hanger shape and it would work just as well, you would (or should) laugh.

But wait.
Some manufacturers of low wing planes stick the aerial on the underside and then ***bend it in half*** to clear the ground.
Insanity.

Think what this does to the radiation pattern. Imagine you are below and behind that aircraft, you will be looking directly at the top of the aerial which is the weakest radiation direction. If the aircraft turned through 90 deg then the signal strength would improve only to drop off when the aircraft is pointing directly towards the receiver. This, I think, explains the intermittent bad transmission.

Straight aerials, positioned **vertically**, will always deliver the best performance. Still not convinced? Ask any yachtie whose VHF whip is at the masthead if the transmissions are affected when heeled over.
I rest my case.

Editor's note:
*All components are important for a good antenna system- cable, connectors, antenna length and orientation, and ground plane. The **ground plane** can be problematic in an aircraft, where position, space and orientation are constrained.*

- *Aluminium skin? Generally no problem- you have a built-in ground plane.*
- *Rag and tube? Mount on a strut or spar, preferably where a compression strut or rib makes a **T** shaped ground plane.*
- *Composite? Make your own ground plane- aluminium foil patch or a star pattern of 3 or 4 wires, radius at least as long as the ¼ wave antenna.*

Quality aircraft since 1974

Mandatory Action
Jan. 2017

Issue Date
January 2017, Rev. 0

Subject
Inspection of the Horizontal Stabilizer tail attachment brackets

Affected Models
All CH (Chris Heintz designs) series of aircraft. This includes the Zodiac and STOL models.

All Canadian Advanced Ultralight CH (Chris Heintz designs) series of aircraft.

Compliance Time
Before next flight

Required Parts
As required

Inspection Frequency
Annual (on-going)

Subject/Purpose

Transportation Safety Board of Canada - **AVIATION SAFETY ADVISORY A16O0137-D1-A1**
Zenair Zodiac CH-601A—Risk of structural failure of the horizontal stabilizer

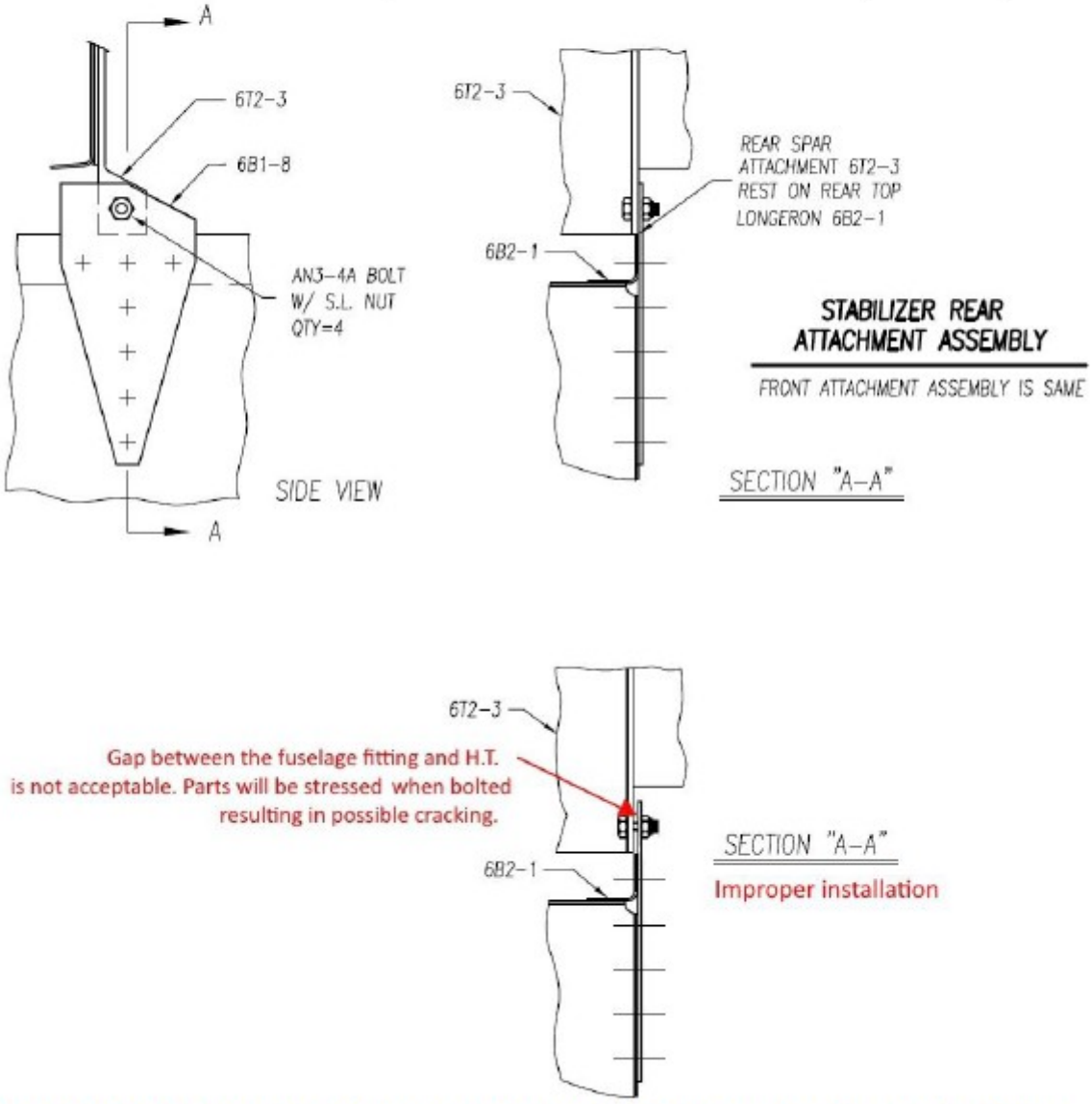
Inspection:

Remove the Horizontal Stabilizer (H.S.) rear and front attachment bolts. Clean the area and inspect the parts. Look for cracks, deformation, improperly installed rivets, rivet and bolt edge-distances, material thicknesses, check that the riveted joints are fastened tightly together and everything else at the attachment brackets on the fuselage and H.S. Inside the H.S., the upper parts of the forward attachment brackets and associated rivets and holes could be viewed by shining a flashlight through the triangular cut-out which the bracket comes out of.

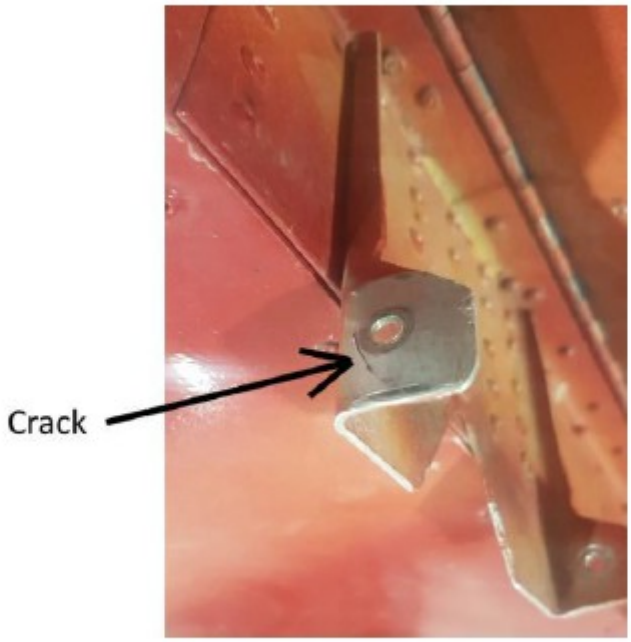
Use the Airframe Drawings, the Design Standards manual and the assembly instructions when inspecting. If you do not have all the information, purchase it from Zenair Ltd.

http://zenair.weebly.com/zenair-service-area.html

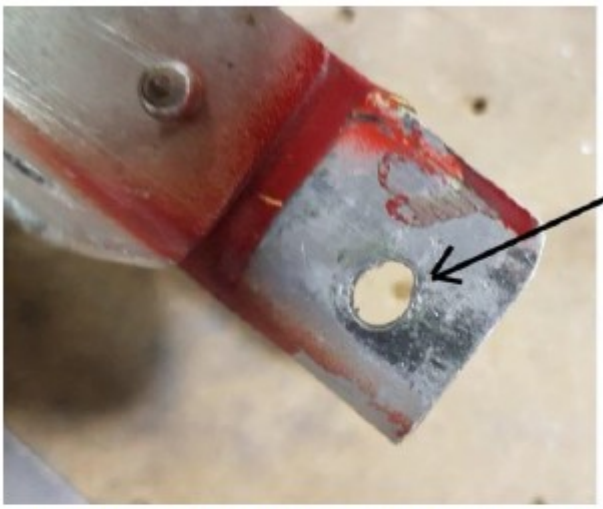
If you did not assemble the airframe, hire a certified aircraft mechanic to complete the inspection.



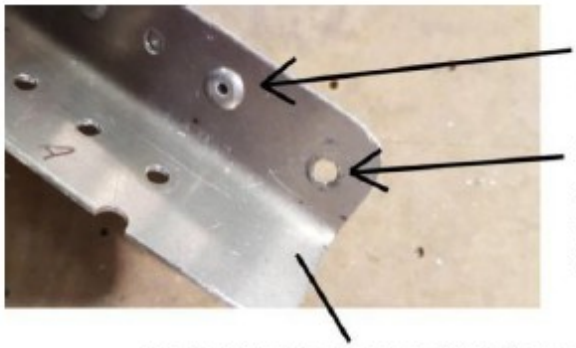
Above assembly drawing is for a typical CH 601 aircraft. Each CH design is different. Use your airframe model blueprints (drawings) and not the above example for inspection and installation.

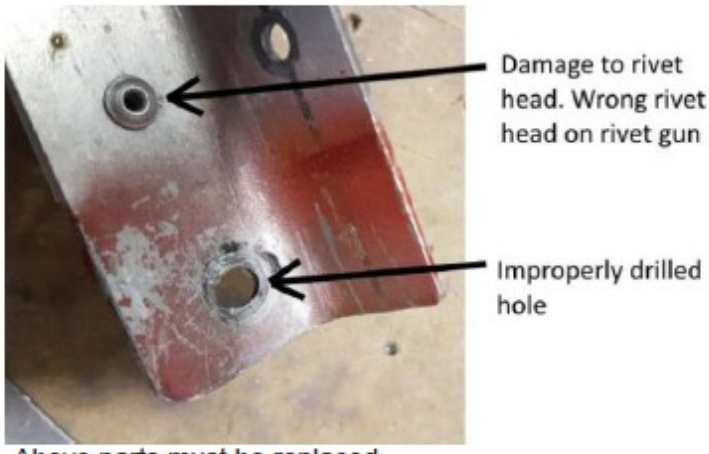


View of H.S. rear attachment bracket. A crack is developing in the part. Part must be replaced.



View of H.S. front attachment bracket. Bolt hole was not properly drilled. Part must be replaced.





Above parts must be replaced.

Above photos are from a typical CH 601 aircraft. Each CH design is different. Use your airframe model blueprints (drawings) and not the above examples for inspection and installation.

Action:

Replace parts that do not match the aircraft airframe blueprints (drawings). Replace parts that have been drilled or assembled incorrectly. The H.S. must fit snug to the fuselage fittings. Bolts when tight must not bend the H.S. fittings. Correct type rivets must be installed properly as per the design standards manual. If you did not assemble your airframe, hire a certified aircraft mechanic to complete this task. Log book entry must be made. When reinstalling, use new AN bolts and self locking bolts. Torque them as per AC 43-13 1B and 2B. Do not over tighten the bolts. Once installed, check control cable tensions, all connections, interferences, etc. See http://www.newplane.com/Service_Letters_Bulletines/Control%20cable%20tensions%20Zodiac.pdf
including all other continued airworthiness documentation and make sure your aircraft is up-to-date before flying. When the aircraft is parked outside, lock the control cables. Strong winds can cause significant damage to the control system.

For additional information contact Zenair Ltd.

ZENAIR LTD, HURONIA AIRPORT, MIDLAND, ONTARIO, CANADA L4R 4K8
TEL:(705) 526-2871 - FAX:(705)526-8022 zenair.com@gmail.com

Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

200 Promenade du Portage
Gatineau, Quebec
K1A 1K8

Our File Reference
A16O0137-D1-A1

06 December 2016

Mr. Aaron McCrorie
Director General, Civil Aviation
Transport Canada
330 Sparks Street, Place de Ville
Tower C, 5th Floor, Area A
Ottawa, Ontario
K1A 0N8

Subject: AVIATION SAFETY ADVISORY A16O0137-D1-A1
Zenair Zodiac CH-601A – Risk of structural failure of the horizontal stabilizer

Dear Mr. McCrorie,

On 24 September 2016, C-FSDN, a privately registered Zenair Zodiac CH-601A advanced ultra-light aeroplane, was on a VFR flight from Pembroke (CYTA), Ontario, to Kitchener/Waterloo (CYKF), Ontario. Approaching destination, the pilot reported radio problems to the CYKF Control Tower and advised of a diversion to Guelph (CNC4), Ontario. While on final approach for landing on Runway 32 at CNC4, the aircraft rapidly pitched down from approximately 500 feet and crashed into a wooded area 1 nautical mile from the runway. The aircraft was destroyed and the pilot, who was the sole occupant, was fatally injured.

In accordance with the TSB Occurrence Classification Policy, the circumstances of this occurrence were assessed, and the occurrence was deemed to be a Class 5. Consequently, TSB activity was limited to the collection of data, which have been recorded for safety analysis, statistical reporting, and archival purposes. The following paragraphs contain safety-related information derived from the assessment of this occurrence.

A structural inspection of the aircraft's tail section revealed inconsistencies between the actual assembly and the applicable drawing set. Inconsistencies with acceptable methods, techniques, and practices for inspection, repair or alteration, as outlined in Federal Aviation Administration Advisory Circulars 43.13 1B and 2B, were also identified. The complete tail assembly was sent to the TSB Laboratory in Ottawa for further analysis.

The exact drawing set and construction manual used to build the aircraft could not be obtained; however, a similar set that was published two years following the construction of the occurrence aircraft was located. The drawings are believed to be similar.

As per the drawing (Figure 1), the horizontal stabilizer forward structural attachment is designed to be constructed by riveting two aluminium angles (attachment bracket 6-T-2-1 and attachment doubler 6-T-2-2) with three rivets back-to-back and connecting the attachment bracket to the front surface of the forward spar (6-T-1-3) with five rivets.

In the actual installation, the three rivets connecting each attachment bracket to the associated attachment doubler were missing and the required holes were not drilled. Four additional holes were drilled through the left attachment bracket and continued through the forward spar. Rivets were installed in all of these additional holes; however, they were only installed in one of the five holes specified in the drawing.

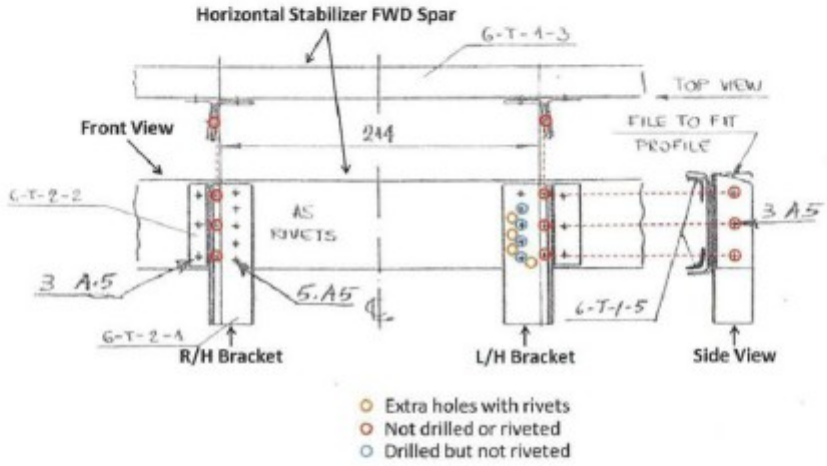


Figure 1. Horizontal stabilizer forward structural attachment—aircraft drawing. (source: Zenair, with digital annotations by the TSB)

Structural integrity of the horizontal stabilizer forward attachment point was compromised on both sides because of the missing rivets, and the strength of the forward spar itself was reduced because of the extra holes.

The occurrence aircraft was built by an individual in 1994, and was based on a kit manufactured by Zenair. It was registered with Transport Canada as an advanced ultra-light aeroplane (AULA). To apply for registration of an AULA, a Statement of Conformity (SOC) issued by the manufacturer is required.

Prior to issuance of a SOC, Zenair currently requires that two independent inspections be completed: a pre-closing inspection by a Minister's Delegate—Recreational Aviation, and a pre-flight inspection by a Transport Canada certified aircraft maintenance engineer.

The manufacturer introduced these requirements approximately five years ago therefore, at the time of construction and initial registration of the occurrence aircraft, neither of these independent inspections was completed. Numerous other Zenair aircraft were built and

registered before this requirement was in place and it is likely that these aircraft were not inspected either.

As shown in this occurrence, if adequate independent inspections are not conducted during the manufacturing of an aircraft, non-conformance with the intent of the drawing, and/or construction manual, and/or acceptable methods, techniques and practices could go undetected, thus increasing the risk of a structural failure and complete loss of control during any phase of flight.

The foregoing is provided for follow-up action as deemed appropriate. The TSB would appreciate being advised of any action taken.

Yours sincerely,

Yanick Sarazin
A/Director of Air Investigations
Transportation Safety Board of Canada

cc:
Mr. Michael Heintz, Zenair Ltd.
Mr. Bernard Gervais, President & CEO, Canadian Owners and Pilots Association
Mr. Gary Wolf, President, The Recreational Aircraft Association Canada
Ms Kathy Lubitz, Ultralight Pilots Association of Canada
Mr. David Gascoine, President & CEO, Light Aircraft Manufacturers Association of Canada
Mr Allan Mahon, Minister's Delegate – Recreational Aviation
Mr. Sean Elliott, Vice President of Advocacy and Safety, Experimental Aircraft Association

Membership changes

David Wynne	Bay of Islands Aero Club	Advanced National	Upgrade
Roger Dold	Bay of Islands Aero Club	Advanced Local	Upgrade
Walter Taber	Wairarapa Ruahine Aero Club	Advanced Local	Upgrade
Robert Newbigging	Opotiki Aero Club	Senior Flight Instructor	Upgrade
Alister Pringle	Geraldine Flying Group	Novice	Joined
Shanon Eyre	Matamata Aero Club	Intermediate	Upgrade
Hayden Faulknor	Hawkes Bay and East Coast Aero Club	Advanced National	Upgrade
Peter Dell	Gyrate Flying Club	Advanced National	Upgrade
Gregory Molineux	Geraldine Flying Group	Advanced National	Upgrade
Cris Lawry	Canterbury Recreational Aircraft Club	Advanced Local	Upgrade
Jason Tassell	Parakai Aviation Club	Novice	Joined
Viorel-Florin Predan	Canterbury Recreational Aircraft Club	Intermediate	Upgrade
Dave Witherow	Otago Aero Club	Advanced National	Upgrade
Sarah Colliver	Feilding Flying Club	Senior Flight Instructor	Upgrade
Warren Sly	Mercury Bay Aero Club	Advanced National	Upgrade
Matthew Wilkins	Feilding Flying Club	Novice	Joined
Peter Aspell	Canterbury Recreational Aircraft Club	Novice	Joined
Garth McVicar	Gyrate Flying Club	Novice	FRTO
Mark Oliver	Associate	Advanced National	Joined
Daniel Breakspeare	Motueka Recreational Flying Club	Advanced National	Joined
Gary Prouting	Geraldine Flying Group	Novice	Joined
Maria Pietras-Jensen	Canterbury Recreational Aircraft Club	Novice	Joined
Graeme Duske	Matamata Aero Club	Novice	Joined
Norris Charlton	Wairarapa Ruahine Aero Club	Advanced National	Joined
James Ferguson	Nelson Microlight Club	non-flying	Joined
John Scott	Canterbury Recreational Aircraft Club	Novice	Joined
Anna Wruck	Canterbury Recreational Aircraft Club	Novice	Joined
Garth Clow	Waikato Microlight Club	Novice	Joined
James Bertie	Canterbury Recreational Aircraft Club	Novice	Joined
John McMullan	Wairarapa Ruahine Aero Club	Advanced National	Joined
Craig McBride	Wairarapa Ruahine Aero Club	Novice	Joined
Paul Milnes	Canterbury Recreational Aircraft Club	Novice	Joined
Niall Mueller	Associate	Novice	Joined
Alexander Shadbolt	Canterbury Recreational Aircraft Club	Advanced National	Joined
Neil Hintz	Associate	Novice	Joined

PO Box 15-016
Dinsdale 3243
Hamilton

07 825 2800
office@raanz.org.nz
w: www.raanz.org.nz