aviation excellence plane & simple

FLIGHT STRUCTURES LTD

DESIGN, BUILD, CERTIFY

750XL-II Type Certification

Safety vs Compliance

Design Description

New Company New Design Office

Outstanding Issues

Takeoff Procedure

Noise Testing

Outstanding Result

Video

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

Safety and Compliance

rare occasion when they clash

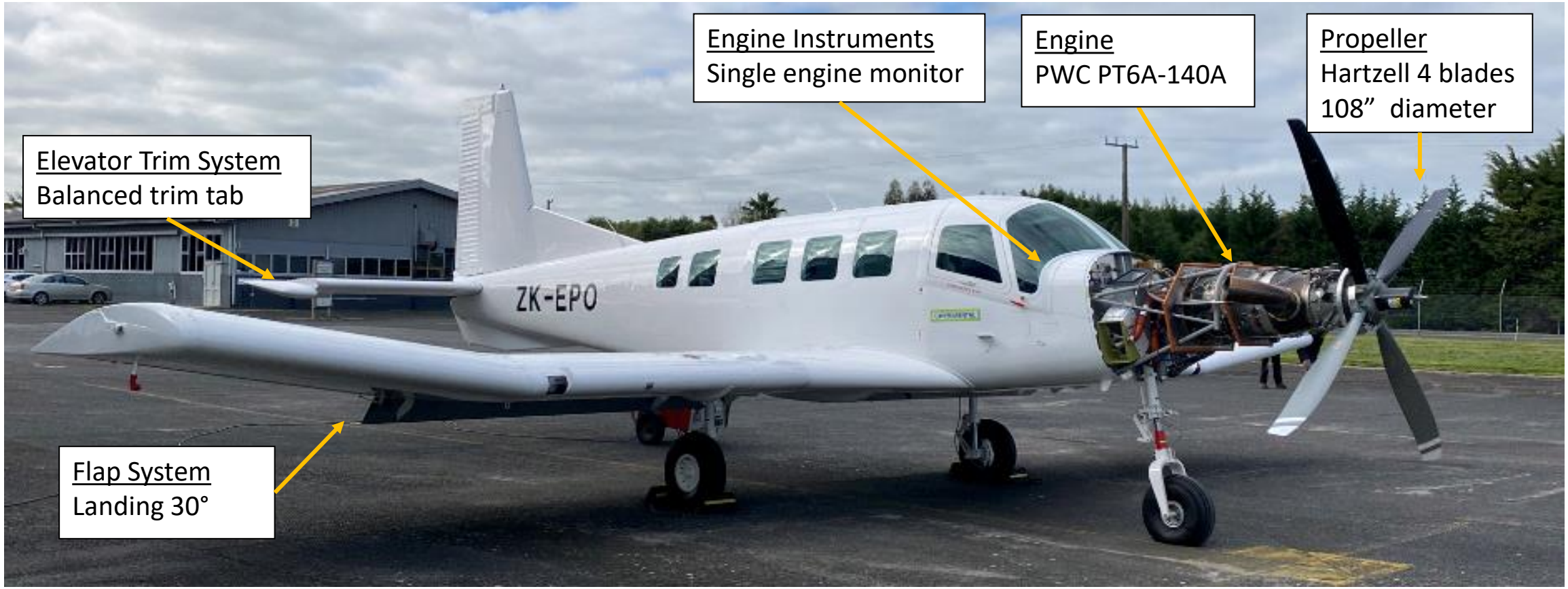
SAFE

COMPLIANT

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II “SuperPAC”

changes from basic 750XL



FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II project – pre 2021

pacific aerospace

- Pacific Aerospace Ltd
  - Initiated 750XL-II project 2016
  - First flight 2018
  - Completed
    - Design and development
    - Structural test programme
    - Comprehensive flight test programme
  - Generated drawings and reports
  - Engaged CAANZ
  - Identified certification issues
  - Did majority of the work

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II project - 2021

new owners, new design office

NZ SKYDIVE LTD

Proudly producing Pacific Aerospace 750XL, Cresco & Fletcher, E-350 Expedition, CT/4 Airtrainer

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II project

outstanding tasks as at 2021

- For 750XL-II project
  - Check and approve drawings and reports
  - Complete flight test programme
- Plus
  - Prepare aircraft flight manual
  - Prepare aircraft maintenance manual
  - Develop new takeoff procedure
  - Develop new stall warning system
  - Upgrade pitch trim system
  - Schedule CAA audit flight test programme
  - Conduct noise testing
- But first for NZSkydive
  - Become Part 146 organisation
    - New DDH
  - Become Part 148 organisation
  - Complete TC amendment for 750XL with G600TXi EFIS
  - Provide production support
  - Provide fleet support
  - Manufacture 2nd prototype ZK-EPO (1st had been sold)
  - Gain 2nd test pilot approval (1st had gone)
- First flight ZK-EPO June 2022

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL EFIS with G600Txi

certified November 2022

A-14 Page 4 of 8

Drawing List:

PAC Drawing No. 11-00001-1 or
PAC Drawing No. 11-00005-1 (See Note 7) or
PAC Drawing No. 11-00005-2 (See Note 7) or
PAC Drawing No. 11-00005-3 (See Note 7) or
PAC Drawing No. 11-00007-1 (See Note 8) or
PAC Drawing No. 11-00009-1 (See Note 10)

Certification Basis:

New Zealand Civil Aviation Rules Part 21B current on 25 January 2000 (amendment 5 dated 25 December 1997).

United States Federal Aviation Regulations:

– Part 23 effective 1 February 1965 as amended by amendment 23-1 through 23-55 dated 1 March 2002.

– Part 34 dated September 10, 1990, including Amendments 34-1 through 34-3 dated 2nd March 1999.

– Part 36 effective 1 December 1969 as amended by amendment 36-1 through 36-24 dated 8 July 2002.

The following requirements are not complied with but are compensated for by factors that provide an equivalent level of safety:

FAR 23.1505(c) – See CAA ELOS Decision memo dated 18/7/03.

Application for certification dated 25 January 2000.

– Aircraft with optional HC-E4N-3P 4-bladed propeller installed by modification PAC/XL/0453 have complied with FAR Part 36 at amendment 36-28.

– Modification PAC/XL/0448 (Extended range wing) has been certificated against FAR 23 effective 1 February 1965 as amended by amendment 23-1 through 23-61 dated 20 May 2011.

– Modification PAC/XL/0679 "Installation - Avionics and Instruments IFR-25A" as defined in 11-00005-2 aircraft are certificated against FAR 23 effective 1 February 1965 as amended by amendment 23-1 through 23-62 dated 31 January 2012.

– Modification PAC/XL/0784 "Installation - Avionics and Instruments IFR-26A (G600TXi)" as defined in 11-00005-3 aircraft are certificated against FAR 23 effective 1 February 1965 as amended by amendment 23-1 through 23-63 dated 21 March 2017.

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

Take Off Procedure

safety issue

- Test pilot advised that basic 750XL takeoff procedure is not suitable for 750XL-II
  - Cannot hold aircraft on brakes with full power applied
  - Full power not required for light weights
  - Aircraft tends to lift off before rotate speed
  - Cannot select V_{50} airspeed before passing through 50 ft
  - Takeoff is quite dynamic
- CAANZ audit test pilot concurred

Basic 750XL procedure

4.11 NORMAL TAKEOFF

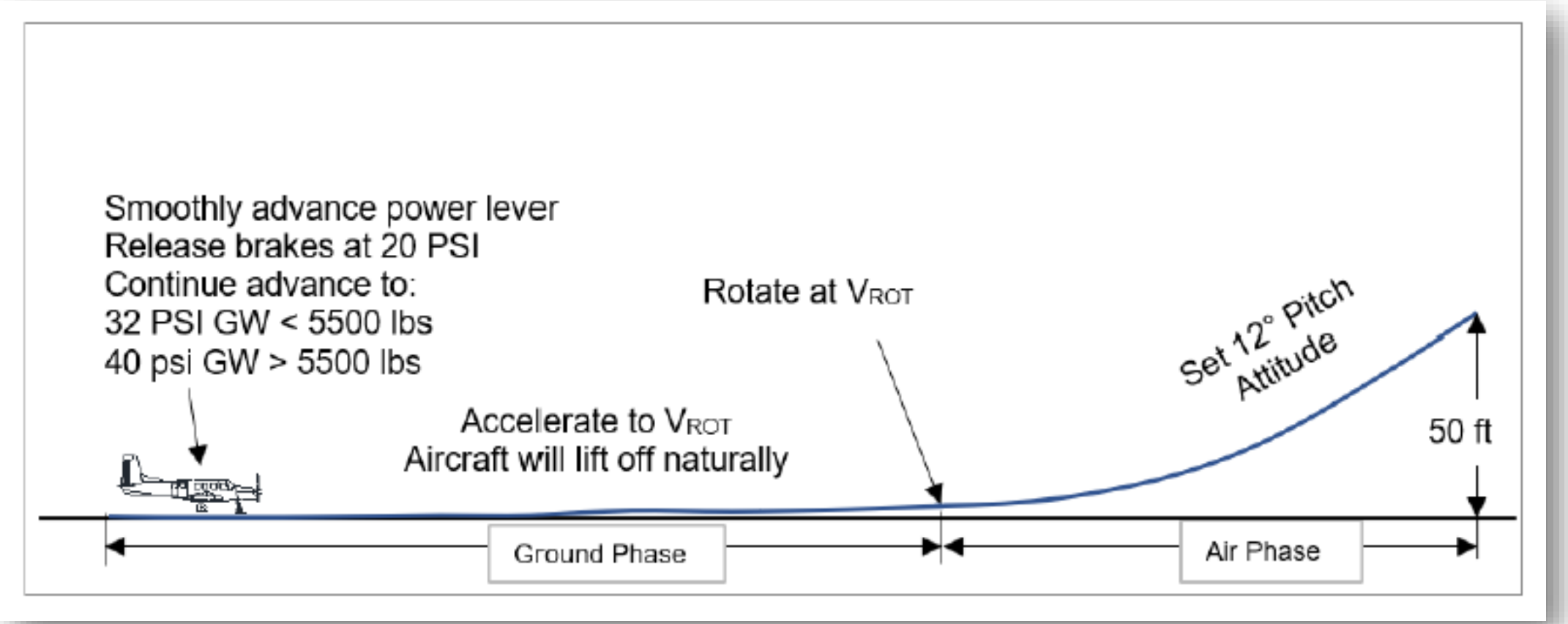
The Normal Takeoff technique is the technique used to derive the takeoff performance data in Section 5.

Lined Up On Runway		CHECK COMPASSES COMPARE WITH RUNWAY HEADING
Fuel Condition Lever		FLIGHT IDLE (fully forward)
Brakes		APPLY FOOT BRAKES AND HOLD
Governor Overspeed		Set 73% Np (1606 RPM) with Power Lever, push and hold Governor Overspeed Test Button, move Power Lever forward to set 84% ± 1% (1848 RPM ± 22). Np should not exceed 85% (1870 RPM), set 73% with Power Lever, release Governor Overspeed Test Button (first flight of the day only)
Power Lever	*Too much power when light*	SMOOTHLY ADVANCE POWER LEVER TO TAKE OFF POWER, OBSERVE ITT AND ENGINE LIMITS
Engine Instruments		CHECK ENGINE SETTINGS WITHIN LIMITS
Brakes		RELEASE *Cannot hold full power*
Rotation	*A/C tends to self levitate*	61 KIAS (refer to Section 5 for speeds at reduced weights)
Initial Climb	*Who knows its happens too fast*	74 KIAS UNTIL CLEAR OF OBSTACLES (refer to Section 5 for speeds at reduced weights)
Clear of Obstacles		Accelerate to 91 KIAS (refer to Section 5 for speeds at reduced weights)
Flaps		RETRACT to 0^0 AT SAFE HEIGHT

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II Take Off

new procedure



FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II Take Off

normal procedure in AFM

Power Lever and Brakes	SMOOTHLY ADVANCE POWER LEVER RELEASE BRAKES AT 20 PSI ADVANCE POWER LEVER TO: 32 PSI at GW < 5500 lbs 40 PSI at GW > 5500 lbs
Engine Instruments	OBSERVE ITT AND ENGINE LIMITS
Control Column	MAINTAIN LIGHT BACK PRESSURE (Lighten load on nose wheel)
Rotation	ACCELERATE TO V_{ROT} (Aircraft will lift off naturally) ROTATE AT V_{ROT} (refer Table 4-1)
Initial Climb	Set 12°(approx.) PITCH ATTITUDE UNTIL CLEAR OF OBSTACLES (V_{50} SPEEDS refer Table 4-1)*
Clear of Obstacles	ACCELERATE TO CLIMB SPEED

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II Noise

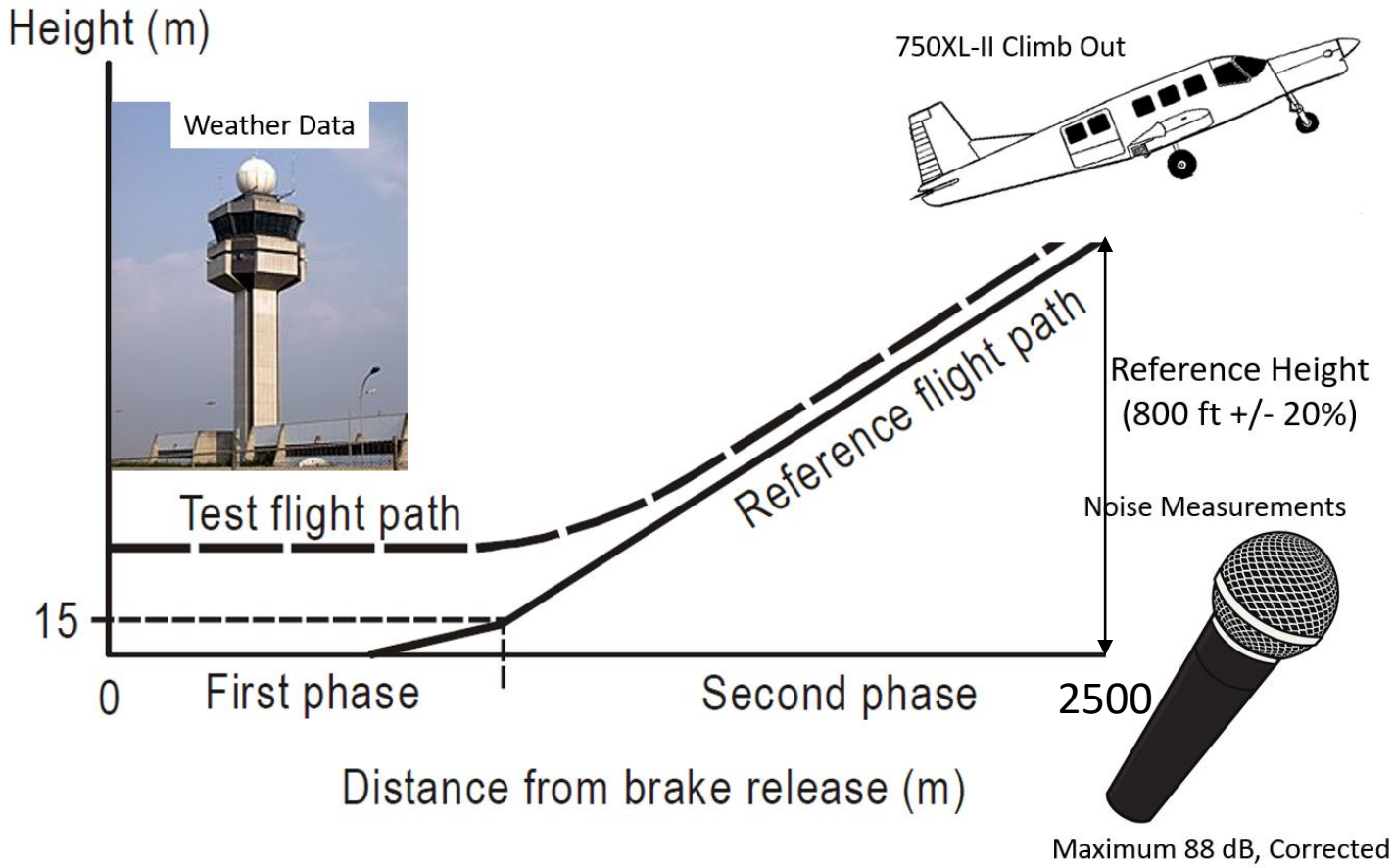
compliance issue

- Basic 750XL meets FAA FAR 36 and EASA CS 36 noise requirements
- 750XL-II is noticeably quieter than basic 750XL
  - 750XL-II propeller speed is 1900 rpm compared to 750XL 2000 rpm
- Noise testing of 750XL-II is required to comply with FAR 36

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

Noise Testing

adopt FAA guidance AC 36-4D

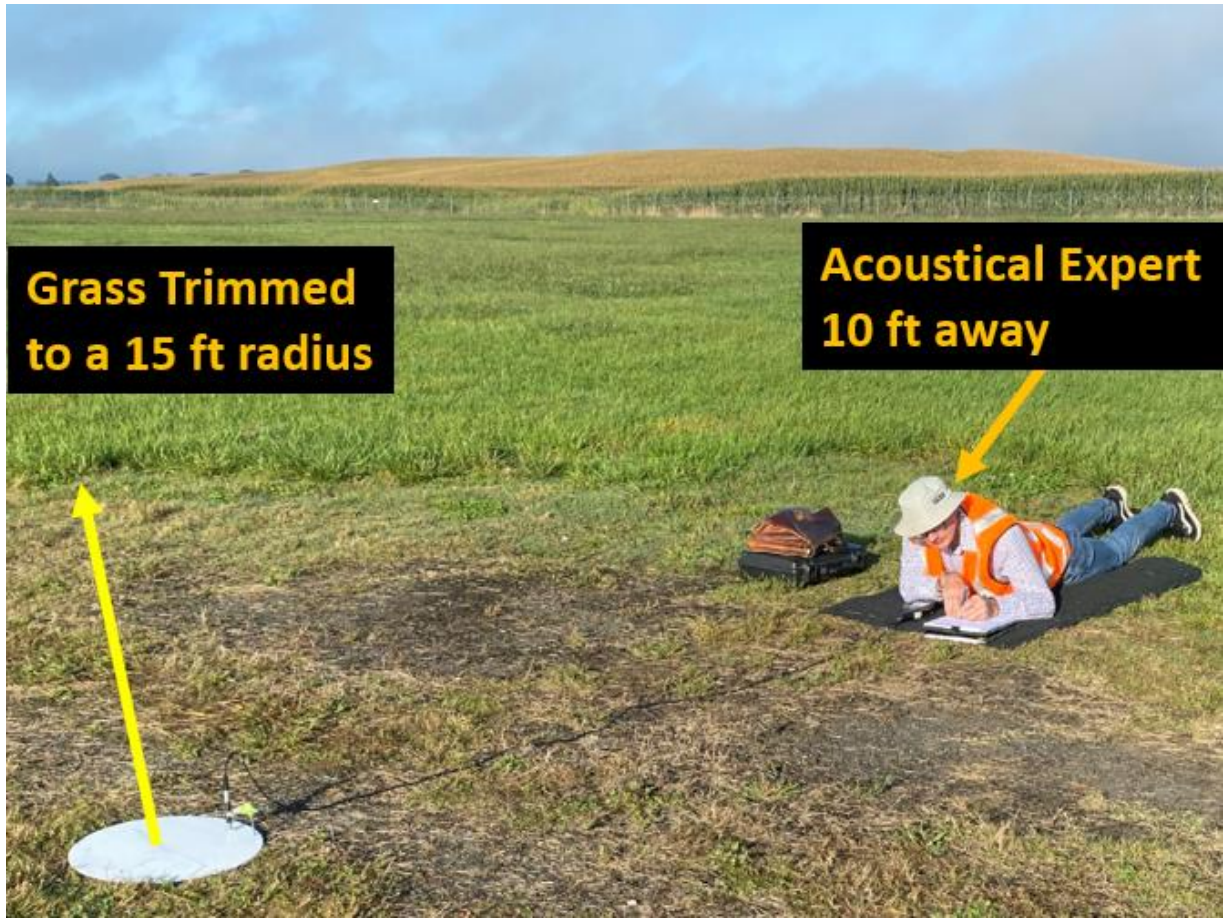


FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

Noise Testing

test setup and result

- Employed acoustical expert
- Calibrated equipment
- Test plan accepted by CAANZ
- Three rehearsals
- Noise testing witnessed by CAANZ
- Corrected noise level 84db



FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II Noise Test

outstanding in the field

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

Civil Aviation Authority of New Zealand

outstanding in the boardroom

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

750XL-II Type Certificate

issued July 2023

CIVIL AVIATION AUTHORITY OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

TYPE CERTIFICATE

No. A-14

Pursuant to Civil Aviation Rule Part 21 Subpart B this certificate is issued to

NZSkydive Ltd
Trading as Pacific Aerospace
333 Airport Rd
Hamilton, New Zealand

and certifies that the design for the

750XL

750XL-II

with the operating limitations and conditions specified in the Type Certificate Data Sheet meets the New Zealand type certification requirements stated in Civil Aviation Rule Part 21 Subpart B.

This certificate, and the Type Certificate Data Sheet which is a part hereof, shall remain in effect until surrendered, suspended, or revoked.

Re-issued this 18th day of July 2023

for Director of Civil Aviation

Originally Issued to Pacific Aerospace Corporation for Model 750XL on 27 July 2003
Transferred to Pacific Aerospace Ltd on 12 December 2006
Transferred to NZSkydive Ltd on 29 November 2021
Re-Issued for Model 750XL-II (Date of Application 1 December 2021)

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

innovation in action

agricultural aviation (show video)

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY


www.flightstructures.co.nz
touchbase@flightstructures.co.nz
ph +64 7 843 1128
CAA
FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY