AIR NELSON

Captain John Martin

Head of Flight Safety Programmes

Route Structure

Air Nelson Bases

Current Company Fleet:
13 SAAB 340's
6 Bombardier Q300's

58,000 Flights Annually

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Traffic Collision Avoidance System

TCAS is a family of airborne devices that function independently of the ground-based air traffic control (ATC) system to provide collision avoidance protection for a broad range of aircraft types.

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TCAS Computer interrogates Transponders of other aircraft in the vicinity, tracks their range & bearing and Calculates a time to the Closest Point of Approach (CPA) The time value is the main parameter for issuing alerts.

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Collision Alerts

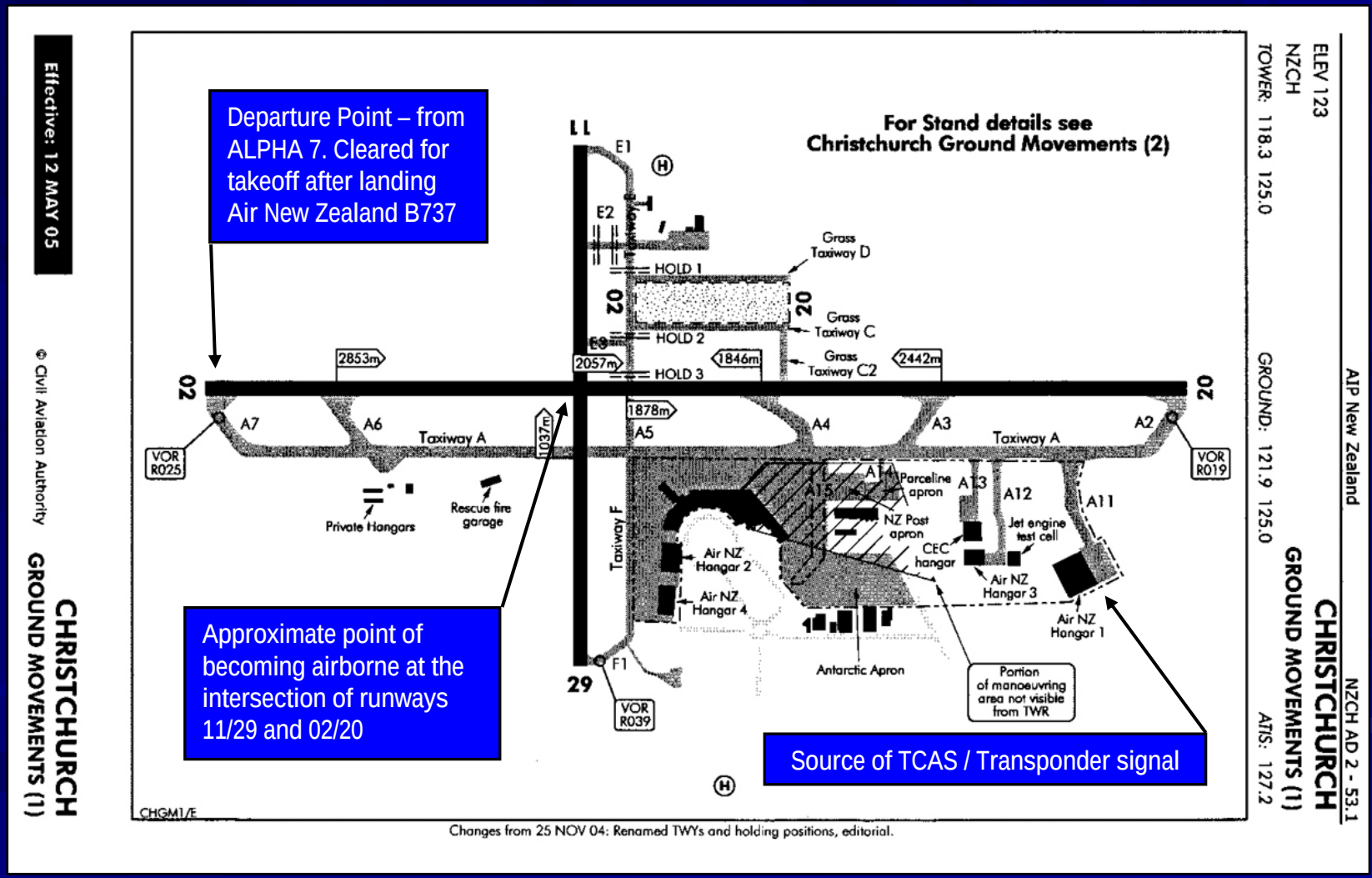
- Traffic Advisory (TA)
- Resolution Advisory (RA)

Safety Investigation Report

Occurrence investigated: O62-05
24-May-05 09:32 ST

TCAS ALERT

Christchurch International Airport



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Flight Deck TCAS Representation

Intruder Aircraft displayed on TCAS

The “Range Ring” is 2nm or 3700m from the “own aircraft” symbol. It is estimated that the Air New Zealand No.1 hanger is displaced laterally approximately 500m from the centreline of runway 02/20.

Airways Corporation Radar Display

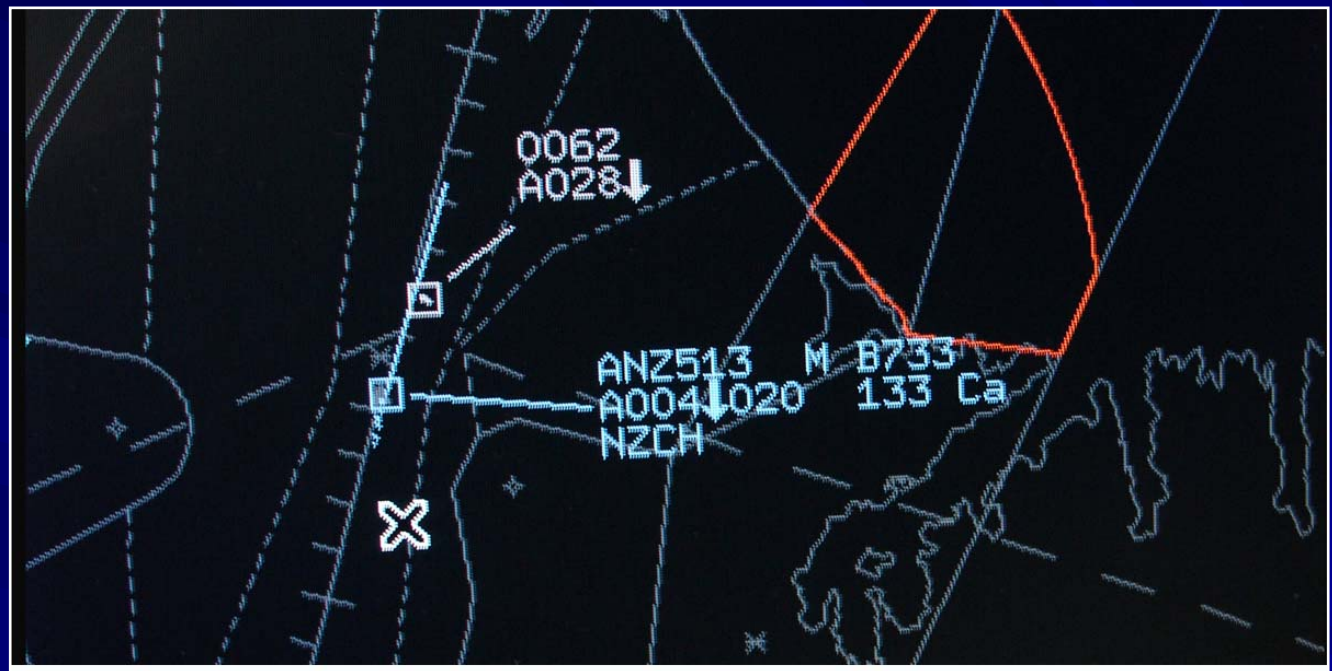

Figure 1.
Air New Zealand Boeing 737 on approach.
TCAS "Test" Aircraft squawk 0062,
descending through 2800'amsl.

Airways Corporation Radar Display

Figure 2.

Link 164 airborne, climbing through 400'amsl, TCAS "Test" aircraft below 1500'amsl.

Airways Corporation Radar Display

Figure 3.

Link 164 maintaining 800'amsl after conflict.
TCAS "Test" aircraft maintaining 1100'amsl.

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TCAS II - VERSION 7

Operating Modes

RADIO ALTITUDE	RESOLUTION ADVISORY (RA) STATUS:
Below 1550 FT AGL	"INCREASE DESCENT" RA Inhibited
Below 1100 FT AGL	"DESCEND" RA inhibited
Below 1000 FT AGL	*All RA's inhibited (TA ONLY)*

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Transponder TEST Procedure

- Aircraft squat switches disabled / Flight Mode.
- Aircraft Transponder reply at full power – sensed by overflying aircraft, displayed on TCAS.
- Transponder testing conducted throughout NZ.

Test Equipment

- PITOT STATIC source – capable of ± 6000 ft per min. Limited to prevent damage to pressure instruments.

Transponder Test vs Overflying Aircraft

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Antenna Shielding

- Test equipment manufacturers recommend antenna shielding, however no regulatory requirement to comply in NZ
- 139 DIFFERENT TYPES of aircraft worked on in one workshop alone.
- Many have embedded antennas which will be almost impossible to shield.

Recent Occurrences

- Melbourne, Australia – 10 March 2006.
- Auckland, New Zealand – 14 December 2005.
- Sydney, Australia – 11 July 2003.

NZ AIP

For transponder testing the NZ AIP states the following;

3.6 Transponder Testing

3.6.1 Operational testing of transponders should, if possible, be carried out only in shielded areas or under controlled conditions. Transmissions from transponders operating in Mode A and C under test may be interpreted by ATC radar and aircraft ACAS systems as stationary aircraft, thereby giving false alerts to controllers and pilots respectively. Transmissions from transponders under test cannot be filtered out by these systems.

3.6.2 If transponder testing in Mode A and C is required to take place in unshielded conditions the following applies:

(a) Notify the nearest ATC unit of the intention to test transponders, giving time period involved;

(b) Unless a specific code has been issued for use, operate the transponder on codes 0050 – 0057;

(c) When testing Mode C output, if possible set to 40,000ft or above.

ATC may request a delay where testing may impact on traffic management.

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SUMMARY

NZCAA Investigation included-

- FAA consultation for information on events within the USA.
  - FAA does not track incidents involving false RA's
- Boeing considers issue serious.
  - valid concern and will review and revise maintenance procedures to minimize, or eliminate altogether, any interference problems.

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SUMMARY

- Complete industry co-operation required.
- Elimination of all false conflicts.
- Failure to do so may result in:
  - Known areas of false conflicts.
  - Pilots “second guessing” the validity of targets displayed.
  - Overall reduction in TCAS effectiveness.