# FINAL REPORT

**AAIU Synoptic Report No: 2008-004**
**AAIU File No: 2007/0087**
**Published: 5/03/2008**

**In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Air Accidents, on 24 September 2007, appointed Mr. Frank Russell as the Investigator-in-Charge to carry out a Field Investigation into this Serious Incident and prepare a Synoptic Report.**

| | |
|---|---|
| **Aircraft Type and Registration:** | (i) B737-8AS, EI-DCZ<br>(ii) MD-83, OE-IKB |
| **No. and Type of Engines:** | (i) 2 x CFM 56-7B<br>(ii) 2 x PW JT8D- 219 |
| **Aircraft Serial Number:** | (i) 33815<br>(ii) 49448 |
| **Year of Manufacture:** | (i) 2005<br>(ii) 1986 |
| **Date and Time (UTC):** | 23 September 2007 @ 19.51 hrs |
| **Location:** | Reporting Point ' BANBA', off the SE coast of Ireland. |
| **Type of Flight:** | Both Public Transport. |
| **Persons on Board:** | (i) Crew - 6 Passengers - 179<br>(ii) Crew - 6 Passengers - 164 |
| **Injuries:** | None |
| **Nature of Event:** | AIRPROX, loss of required vertical and lateral separation of aircraft. |
| **Commander's Licence:** | Both JAA ATPL's |
| **Commander's Details:** | (i) Male, aged 52 years<br>(ii) Male, aged 43 years |
| **Commander's Flying Experience:** | (i) 13,800 hours of which 3,000 were on type<br>(ii) 7,500 hours of which 1,100 were on type |
| **Notification Source:** | General Manager, ATC, Shannon Airport. |
| **Information Source:** | AAIU Field Investigation |

# FINAL REPORT

## SYNOPSIS

Two passenger aircraft entered Irish controlled airspace near Reporting Point BANBA at high level off the South East coast of Ireland. One was an MD-83 routing northwards towards Dublin from Faro, and the second was a B737 routing westwards towards Cork from Stansted. The former was maintaining Flight Level (FL) 280, while the latter, which was cruising at FL300, was cleared initially by the Shannon based Air Traffic Control (ATC) Radar Controller to descend to FL290 and subsequently to FL100. This ATC clearance conflicted with the path of the northern bound aircraft, and, in spite of at least four warnings, one verbal and three electronic, the Radar Controller appeared not to comprehend the closing speeds of the two aircraft and allowed the higher one to descend and lose the required minimum vertical and lateral separation from the other. What ensued was a critical failure of the human element of the ATC system to rectify this situation. The last resort safety net in this extreme circumstance, each aircraft's on board Traffic Alert and Collision Avoidance System (TCAS), automatically activated with a commanded warning to each aircraft. The pilot of each aircraft reacted correctly to this TCAS warning, one climbed his aircraft as instructed by the system and the other descended his aircraft as instructed by the system. A potential mid-air collision was thus narrowly avoided due to the TCAS activation and the correct response of the pilots. With separation subsequently re-established by ATC, both aircraft continued onwards and landed at their respective destinations.

The Air Accident Investigation Unit (AAIU) of the Department of Transport was notified of this Serious Incident shortly after it occurred. Three Safety Recommendations are made as a result of this Investigation.

## 1. FACTUAL INFORMATION

### 1.1 History of the Flight

Shannon Upper Air Control (UAC) was operating in a 2-sector configuration at the time of the occurrence. The aircraft involved were RYR 907, a Boeing 737-800, and FLT 1174, an MD-83. These aircraft were under the control of the Shannon High Level Sector, operating at Area Control Centre 9 or ACC9, where there were light to moderate levels of air traffic movement at the time of the event. Two Controllers manned the BANBA/STRUMBLE Sector, RAD9 (the Radar Controller) and PLC9 (the Planning Controller). They sat at two On-Suite radar screens that are located about one metre apart. These Controller functions are interchangeable and are rotated over the period of a shift, on which there are 10/12 persons per team. Both the RAD9 and PLC9 had commenced their rostered duty at 11.30 hrs local that morning and were scheduled to finish at 21.00 hrs local, i.e. 8 minutes after the subject event occurred. Both Controllers were operating at their workstation for less than one hour following the final rest break of their shift.

The following information is taken from relevant radar and audiotapes **(Appendix A)** and occurred within the timescale **19.46:13** to **19.51:21** hrs:

- RYR 907 contacted ACC9 maintaining FL300[1], heading 273º and was cleared direct to Cork.
- FLT 1174 contacted ACC9 maintaining FL280 and was cleared to Dublin via UN 34 **(**See **Appendix B).**
- There was significant groundspeed difference between the aircraft (RYR 907 at 377 kts and FLT 1174 at 517 kts).
- With 20 nautical miles (NM) between the aircraft, RYR 907 requested descent and was cleared by RAD9 to FL290, and to standby for lower clearance.
- RAD9 then reduced the radar range image to 135 NM to concentrate on the BANBA area, while PLC9 monitored the entire airspace.
- With 14NM between the aircraft, RAD9 instructed RYR 907 to descent to FL100, with a good rate (*of descent*) through FL270.
- Short Term Conflict Alert (STCA) System activated during this transmission on RAD9 radar screen and remained active until after the TCAS Resolution Advisory (RA) conflict ended. (See Para 1.2.2)
- The RYR instruction was (incorrectly) read back by a MALEV aircraft, also inbound for Cork.
- With 13 NM between the aircraft, RAD9 again instructed RYR 907 to descend to FL100, with a good rate (*of descent*) until through FL270.
- RYR 907 read back this instruction and also included "*expedite till through FL270*".
- With 10 NM between the aircraft RAD9 instructed FLT 1174 to turn right 10 degrees.
- With Mode C[2] reading FL291 and 8 NM between the aircraft, RAD9 instructed RYR 907 to "maintain FL290 on reaching…" – as this transmission finished RYR 907's Mode C updated to FL289.
- With Mode C reading FL287 with 6 NM between the aircraft, RYR 907 reported reaching FL286 and returning to FL290.
- With 5 NM between the aircraft RAD9 instructed FLT 1174 to turn right a further 10 degrees.
- With 4 NM between the aircraft and RYR 907 Mode C reading FL286 and FLT 1174 Mode C reading FL280, FLT 1174 reported to ATC that he was following **'*TCAS resolution*'** and commenced descent**. (Appendix C)**
- RAD9 then dealt with another aircraft.
- With 2 NM between the aircraft RYR 907 reported**, '*TCAS climb*'**.

[1] Each flight level (FL) is stated in three digits that represent hundreds of feet. For example, FL300 represents a pressure altitude of 30,000 feet with the altimeter set to 1013.2 hectopascals.
[2] A pulse format for an altitude information interrogation

- Following the TCAS resolution by each aircraft, RAD9 cleared RYR 907 to descend to FL100 and FLT 1174 to descend FL200, respectively.

- Vertical separation of 1,100 feet existed between both aircraft following completion of their response to their respective TCAS RA's.

In the lead up to the event PLC9, the second member of the Sector radar team, pointed out to RAD9 that there was a substantial speed difference between the two aircraft but, thereafter, he became engaged on phone co-ordination with Shanwick and in Flight Strip Progress management. That reference to the speed difference was the limit of his direct intervention with RAD9 in the unfolding event. The Investigation notes that PLC9 has more than thirty years Controller experience, as against the slightly less than two years experience of RAD9.

As both aircraft had now passed each other and received a TCAS '*clear of conflict'* advisory, they continued with their respective ATC clearances to their intended destinations.

***Note:*** The minimum distances between the aircraft were:

***3 NM lateral and 600 feet vertical***

The required separation is a minimum of 5 NM lateral or 1,000 feet vertical. The requirement to separate aircraft is detailed in ICAO Annex 11, Air Traffic Services, which contains the relevant Standards and Recommended Practices (SARPS) for Air Traffic Control.

## 1. 2. Collision Alert and Avoidance Systems

All civil turbine-engine (jet) aeroplanes, having a maximum take-off mass (MTOM) exceeding 5,700 kg or a maximum approved seating configuration of more than nineteen, are mandated to carry and operate ICAO SARPS-compliant Airborne Collision Avoidance System (ACAS) equipment.

### 1.2.1 Airborne Collision Avoidance System (ACAS)

The ACAS equipment currently in industry use is TCAS II, a proprietary version of the system, which uses Secondary Surveillance Radar (SSR) transponder returns to calculate potential airborne conflicts and automatically provides the flight deck crew with alerting and collision avoidance information. TCAS can provide alerting information on any aircraft transmitting an SSR code but collision avoidance guidance can only be provided for conflicting aircraft transmitting Mode C (Mode C is a mode of operation of SSR equipment that has the capability of replying with aircraft altitude) or Mode S (Mode S is the means through which one TCAS II equipped aircraft 'coordinates' avoidance strategies with another TCAS II equipped aircraft). The system has a number of capabilities including a 40 NM surveillance range and 1,200 kts closing speed. In this subject event the Investigation deduced from calculating the velocity vectors, that with a relative closing speed of 630 kts, the aircraft were within 17 seconds of a possible impact.

TCAS II generates two types of annunciations to pilots: Traffic Advisories (*TA*) and Resolution Advisories (*RA*). A *TA* is an advisory issued to the pilot when an intruder's predicted flight path is within 20-45 seconds from entering the TCAS II aircraft's Collision Area.

An *RA* is aurally announced and displayed visually on a cockpit instrument 15-35 seconds from the time the intruder aircraft is predicted to enter the TCAS II aircraft's Collision Area. An *RA* message is a corrective advisory to indicate evasive vertical manoeuvres calculated to increase separation between the TCAS II aircraft and the intruder, or, to indicate that certain changes in vertical speed are not recommended (preventive). An *RA* message is a command made up of a single word repeated three times; longer messages are repeated twice. In the subject event each pilot heard the command *'descend-descend-descend, and 'climb-climb-climb,'* respectively. Their initial vertical speed response (i.e., to descend or climb the aircraft) was expected by the TCAS system to be within 5 seconds, as it patently was in this event.

### 1.2.2 Short Term Conflict Alert (STCA)

STCA is an automated ATC safety net that alerts controllers to potential conflicts that may be coming up within several minutes between aircraft returns on the radar display. It is fully operational in Irish controlled airspace. STCA recognises an aircraft under ATC control by reference to its Mode A code (a mode of operation of SSR equipment that provides a selected code reply -non altitude- when interrogated). Conflict alert warnings will only be given for two aircraft where at least one is being controlled from an ATC unit equipped with STCA. When the system detects a potential conflict, an audio alarm, red SSR labels and a discreet tabular area on the radar display giving the call sign or call sign/SSR code, alerts the radar controller. These three warnings occurred in the subject event. (See **Appendix C**)

### 1.2.3 Velocity Vector

Velocity Vector (sometimes referred to as a Speed vector or Predict Line) is a system controller 'tool' which assists the Controller in predicting the future position of aircraft. When utilized, a line anchored on a RPS (Radar Position Symbol) is generated to show the extrapolated position of an aircraft in a given number of minutes. Two modes of length selection are provided: - global selection for all tracks (default value 2 minutes) or single selection to enable a controller to define (within parameters) the length of the velocity vector for a designated track.

## 1. 3 Pilot Reports

Both pilots submitted a TCAS Event Report to their respective companies on completion of their flights. FLT 1174 Captain's Report stated that the aircraft was in the process of a *second* 10-degree turn to the right in an avoiding action, when they followed the *TCAS RA* command to descend from their assigned altitude. As night visual meteorological conditions (VMC) existed there was brief visual contact with the other aircraft.

RYR 907 Captain's Report stated that the other aircraft was not originally on TCAS as it was below and descending (sic). However, the ATC instruction to expedite their descent brought it into the range of a TCAS alert. The alert sounded and they responded with the TCAS command to climb and, almost simultaneously, ATC instructed them to stop descent. The other aircraft was only observed on TCAS, the Report added, it was not acquired visually.

## 1.4 Air Traffic Control (ATC)

The duties of the Sector Radar Controller and the Sector Planning Controller are laid down in the Shannon Manual of Air Traffic Services (MATS), Part 2, Level 2. Doc. No. 2-2 states *"The most essential elements of the air situation are being monitored constantly by the Radar Controller. This system also provides advanced processing and conflict alert. It is possible to assign full executive responsibility within a given part of the airspace to the Radar Controller. He/she is therefore the Executive Controller on the control suite. He/she is supported by the Procedural Controller (now called the Planning Controller). The Planning Controller is responsible for Flight Progress Board Management and short term planning within his sector, for FPL management, for co-ordination with adjacent ATS units, the compilation of ATC clearances, determination of planned flight levels and if necessary the application of time restrictions. In summary, Shannon ATCC operates as a 'Radar Control Environment."*

The duties of the Sector Radar Controller are numerous and include, *inter alia*, the following:

- Radar Controllers shall ensure that radar identification is established and maintained in accordance with published procedures before attempting to provide a radar service to aircraft, in accordance with ICAO DOC 4444 – RAC 501, Part VI Para 6.2.

- Provide up-to-date information on the position and separation of traffic to the Planning Controller when required.

The duties of the Sector Planning Controller are numerous and include, *inter alia*, the following:

- Provide Air Traffic Control Service to aircraft in his/her sector in accordance with published procedures.

- Maintain flight progress strips on the active bay in flight level sequence, update flight progress strips to the inactive bay when no longer required for control purposes.

- Inform the Radar Controller of any potential conflicts as early as possible.

Further, in MATS Part 2, Section 2-5, the operational concept on intra sector coordination is outlined as follows:

*"The philosophy of operation of a (Radar) control suite is that of a combined team effort between the Radar and Planning Controller"*. This team concept is reinforced by Team Resource Management (TRM) Courses, developed by Eurocontrol and applied to the Irish ATC environment since it's introduction. The stated objective of TRM is to reduce or minimise the impact of team related errors within the Air Traffic Management (ATM) system by improving Team safety performance.

Attendance on these Courses is mandatory for Station Managers, Operational Controllers and Data Assistants from the three State Airports, Dublin, Cork and Shannon.

The present Course cycle is every three years and is facilitated by the IAA Training Centre at Shannon. In addition, and of some relevance, the Investigation notes that the current Management structure in Shannon does not include a stand-alone post of Standards Officer.

This function is currently vested in the Operations Manager, as part of his remit (further comment in the **ANALYSIS** Section).

Among the chain of events leading up to the serious incident on the evening of 23 September 2007 was the critical breakdown in follow up communications between the Planning Controller and the Radar Controller, where the Planning Controller might have continued to monitor the closing speed situation and been more assertive in the verbal interaction with the Radar Controller. As it happened, the Planning Controller said he was distracted by an operational phone call with Shanwick/flight strip management after pointing out to the Radar Controller that a substantial ground speed difference existed between the two aircraft, i.e., FLT 1174 was closing at a faster rate from the South. He said that he trusted the Radar Controller's decision-making process to resolve the situation, the implication being that there were more than sufficient electronic warnings on screen to resolve any traffic conflict arising. However, and unnoticed by the Planning Controller, the Radar Controller cleared RYR 907 to descend towards the flight path of FLT 1174, thereby misjudging the uncluttered screen evidence that urgent action to the contrary was needed. A potential collision was avoided by the intervention of each aircraft's TCAS system. Neither Controller played any part in the ultimate safe resolution of this avoidable airproximity.

Shortly after the incident, the Radar and Planning Controllers were relieved of their duties and had the privilege of exercising their ATC ratings withdrawn. This was pending a detailed debrief by ATS management, their review of all the events contributing to this occurrence and their intended remedial action. In addition, both Controllers were offered post Critical Incident Stress Management (CISM) counselling.

## 1.5 Meteorological Information

The Aviation Service Division of Met Éireann gave the following approximation of the winds at FL 300 as follows:

The World Area Forecast Centre (WAFC) forecast chart for 1800 UTC on 23/9/2007 showed a jet stream of approximately 80 to 90 kts, with a 240-degree direction in the vicinity at the time. Resolving this into easterly and northerly components suggests that an aircraft on a heading of 270 degrees would have encountered a head wind component of approximately 50 kts, whilst an aircraft on a 360 degree heading would have a tailwind component of about 62 kts. Met Éireann added that these figures would have represented the situation around the time of the incident.

# 2 ANALYSIS

**2.1** The aviation industry has developed a three-tiered prevention system to minimize the occurrence of near midair collisions (NMAC's as the FAA refers to them) and midair collisions.

The *first tier* is the flight crew, who carry primary responsibility for maintaining safe separation between aircraft. They are required to adhere to the principal of "see and be seen", and their training specifically includes the use of scanning techniques to identify other aircraft as well as special procedures to be used to avoid NMAC's.

The *second tier* is the air traffic control system, which uses air traffic control procedures and radar derived data to maintain safe separation between aircraft.

The *third tier* is the Traffic Collision Avoidance System (TCAS). TCAS senses when the flight path of an aircraft may be in conflict with that of another aircraft and provides the flight crew with guidance as to what action to take to resolve the potential conflict.

In the subject event the first and third tier worked as expected. The second tier, the ATC system, whose elements of Management Control include people, procedures and equipment, failed in its people and application of certain procedures. Fundamental to ATC procedural operations are three interlinked elements of aircraft separation, namely, *Flight Level, Time and Airspeed*. Accordingly, if any one of those elements is missing the operation's safety is compromised until corrective action is taken by the system, i.e., by Air Traffic Controllers or by electronic means or both. In this event, the Radar Controller compromised the element of Flight Level by misjudging the closing ground speed of each aircraft and inexplicably clearing RYR 907 to descend towards the path of the oncoming FLT 1174, when what was needed was to instruct RYR 907 to maintain FL290 until FLT 1174 had passed safely below at FL280. Another minute's level flight would have achieved the safe and routine passage of each aircraft. However, this did not happen. Both Controllers were sufficiently aware aurally and electronically/visually of the potential conflict. They individually recognised the problem but their collective responses were inadequate to the task. In the belated attempt to recover the situation, the Radar Controller gave FLT 1174 two separate instructions to turn right 10 degrees but neither of these turns would have been sufficient to ensure lateral separation and were contrary to ATC Procedures. In addition, the Radar Controller's instruction to RYR 907 to *"maintain flight level two niner zero on reaching"* was too late as the aircraft had already descended through that level. Also, about this time, both aircraft would have been responding to their respective TCAS Commands. In such instances, pilots are required to respond *immediately* to their Resolution Advisory Commands and *then* to advise ATC of their actions. This call to ATC is usually made some seconds after the actual aircraft response to the RA.

The change of screen range (a normal ATC practice) from 250 miles to 135 miles by the Radar Controller could also have led to the misjudgement of the ground speeds and the Radar Controller's partial loss of situational awareness[3].

The use of the Predict Line might have further alerted the Radar Controller, but it was not selected on; it is a Controller's personal option to use it. The Planning Controller's Predict Line was on, but the radar was on a greater range setting.

**2.2** There are Systemic, Training (aircraft performance/speed/meteorology), Procedural (adherence to SOPs) and TRM issues arising from this event. The Investigation notes that Air Traffic Services (ATS) are provided on a 24/7 (*almost 10,000 air movements were recorded in the incident week alone*), 365 day per year basis, and that the two person teams of Controllers on suite, highly trained and qualified, must rely on each others professionalism to carry out assigned individual tasks while operating as a team.

[3]Situational Awareness means that a human appropriately responds to important informational cues. This definition contains four key elements: (1) humans, (2) important informational cues, (3) behavioral cues, and (4) appropriateness of the responses. Important informational cues refer to environmental stimuli that are mentally processed by the human. The appropriateness of the responses implies the comparison of the response with an expected response or a number of possible expected responses. *Dalrymple, M. A., and Schiflett. S. G. (1997)*

This point was raised by the Planning Controller, the implication being that '*one does not do the others work'*. This is clearly the attitude in *normal* ATS operations and is, perhaps, why the Planning Controller did not go beyond "intervention" as covered in TRM Courses and move into the less clear realm of "challenge" which, in pilot's Crew Resource Management (CRM) Courses implies a more direct and robust response to a deteriorating cockpit situation i.e. a *'non-normal'* situation. This is an area in the constructive TRM Courses (which has it's origins in the successful CRM Courses) that needs to be addressed and thought through in some detail.

In other words, where does routine intervention end and *challenge* begin? In this event, the experience gap between the Planner and Radar Controller would be described in CRM as 'a steep cross cockpit gradient'. In colloquial terms, a potentially 'vulnerable pairing' could also describe the subject Controllers experience gap. However, such pairings are inevitable from time to time in the complex ATC rostering system and therefore it is imperative that Training and ongoing TRM Courses identify this scenario.

In addition, the Investigation notes that the two-day TRM Courses at the Shannon Training Centre are composed of separate Team groupings from the three State Airports, primarily for personnel logistical reasons, or in other words, personnel from different State Airports do not normally meet each other on a Course. While there may be logistical reasons for packaging Teams in this manner, it critically would provide a more focused and open forum for personnel to mix with colleagues from other Airports with whom they do not work on a daily basis. This mixing can only be to the betterment of all involved and a positive contribution to Flight Safety. In that context, the three year cycle of the Course needs also to be addressed and reduced, ultimately to a one or one and a half year cycle, for maximum effect and learning, and particularly so in the case of younger inexperienced Controllers.

**2.3** ATC orientated collaborative *challenging* skills need to be quickly developed so that they form part of a continuous and meaningful contribution to professional development and safe operations. To this end, the creation of a "Standards Officer", who would report to Operations Management, may allow a more efficient bridge between operational rating requirements/annual reviews and a focused course content for TRM participants of varying experiences. The Investigation also proposes that the input/participation of a (retired) commercial pilot would benefit TRM Courses. Such an input would give a better balance and understanding to Course discussions, particularly to younger professionals who have little or no personal experience of flying, other than as passengers.

**2.4** That the AAIU has not investigated an ICAO designated 'Class A ' Airprox (defined as '*Risk of Collision'*) in Irish Airspace since 2001 is an indication of the safety and the reliability of the ATS system, both human and electronic.

However, as this event sharply demonstrates, there are no grounds for complacency in the ultra dynamic aviation environment, bearing in mind that the subject incident was ultimately resolved by TCAS RA and not by ATC intervention.

## 3. CONCLUSIONS

### (a) Findings

1. The pilots of RYR 907 and FLT 1174 responded promptly and accurately to their respective TCAS RA's, thereby preventing the potential mid-air collision of their two aircraft.

2. A number of systemic, Training, On-Suite Procedural and TRM issues were identified and addressed by the Investigation.

3. Air traffic movements in the Sector controlled by the Radar Controller and the Planning Controller were light to moderate at the time of the event.

4. The Planning Controller brought the higher groundspeed of the northbound FLT 1174 to the attention of the Radar Controller in a concerned manner and thereafter made no further intervention.

5. Three electronic warnings occurred to alert the Radar Controller of a potential conflict. The STCA audio alarm, the red SSR labels and the discreet tabular area on the Radar display giving the conflicting aircrafts' call-signs/SSR codes.

6. There was no possibility of Controller confusion in this event. The radar display was uncluttered and electronic cues, as to the correct course of action to take, were clearly available to the Radar Controller.

7. The Radar Controller did not respond appropriately to these unambiguous clues and cleared RYR 907 to descend into the flight path of FLT 1174.

8. The Radar Controller's belated attempts to resolve the situation were overtaken by both aircrafts' response to their TCAS Advisories.

9. TCAS RA on each aircraft commanded descend and climb, respectively. At a closing speed of 630 knots, the two aircraft were within 17 seconds of a possible impact. They came within 600 feet of each other on the vertical plane.

10. Once the TCAS *'clear of conflict'* advisory was given, separation was re-established and the two aircraft continued on to their respective destinations.

11. The safety of RYR 907 and FLT 1174 was seriously compromised by the failure of the Radar Controller to maintain a safe Flight Level between the two aircraft. There were no electronic/technical reasons which contributed to this failure. This was a human error.

12. All ATM safety defences, both human and electronic, were breached in this event. The safe resolution of this occurrence was ultimately resolved by the last line of defence, the aircraft's on board TCAS RA, and not by ATC intervention.

**(b) Cause**

This Serious Incident was caused by the failure of the Radar Controller to maintain safe separation between RYR 907 and FLT 1174, by losing vertical and lateral separation between the two aircraft.

**(c) Contributory Factor**

A major contributory factor was the Radar Controller's partial loss of situational awareness in the unfolding scenario, which led to incorrect and potentially dangerous tactical decisions.

## 4. SAFETY RECOMMENDATIONS

**It is recommended that:**

1. The IAA reviews Training and On-Suite Procedures employed by Radar and Planning Controllers and amend as necessary in the light of the identified events that led to this Serious Incident. **(SR 01 of 2008)**

2. The IAA reviews the TRM Course content/frequency of delivery, with specific emphasis on the human factors contributing to this Serious Incident. **(SR 02 of 2008)**

3. The IAA appoint a Standards Officer in Shannon, to interact between Operations and the Shannon Training Centre, to more effectively link Operational and Training areas of responsibility. **(SR 03 of 2008)**

# FINAL REPORT

## Appendix A

## Relevant Extract of ATC Transcript

RYR: RYR 907
RAD 9– RADAR 9
FLT – FLT 1174
MAH- MAH658

| TIME | STN | TRANSMISSION |
|---|---|---|
| 19.49:04 | RYR | Ryanair nine zero seven standing by for the descent. |
| 19.49:07 | RAD9 | Ryanair nine zero seven descend flight level two niner zero, stand by for lower. |
| 19.49:14 | RYR | Descend flight level two niner zero, Ryanair nine zero seven. |
| 19.49:30 | MAH | Shannon good evening, MALEV six niner eight descending flight level three hundred passing flight level three two zero to Cork. *(During this transmission (19.49:43) STCA activated and remained active)* |
| 19.49:37 | RAD9 | Ryanair nine zero seven Shannon, continue descent flight level one hundred best rate till through flight level two seven zero please. |
| 19.49:48 | *MAH* | Descending flight level one hundred MALEV six five eight. |
| 19.49:55 | RAD9 | Ah negative, that call was for Ryanair nine zero seven. Continue the descent flight level one hundred, best rate till through flight level two seven zero please. |
| 19.50:00 | RYR | Continue flight level one hundred, expedite through flight level two seven zero. Ryanair nine zero seven. |
| 19.50:03 | RAD9 | Flightline one one seven four Shannon turn right ten degrees |
| 19.50:06 | FLT 1174 | Right ten degrees flight line one one seven four. Ah zero one zero is going to be the (unintelligible)…. |
| 19.50:12 | RAD9 | Ryanair nine zero seven Shannon, correction to that, maintain flight level two niner zero on reaching . |
| 19.50:17 | RYR | (Open transmission)……Ryanair |
| 19.50:20 | RYR | Ryanair nine zero seven we're just a levelling out at two eight six. We climb back up to two niner zero. |
| 19.50:24 | RAD9 | Affirm, break break, Flightline one one seven four Shannon, turn a further right ten degrees please. |
| 19.50:29 | FLT | Ten and we're a complying with a TCAS resolution. *(Descending)* |
| 19.50:34 | RAD9 | MALEV six five eight your identified direct Cork. |
| 19.50:37 | MAH | Roger, Thank You. |
| 19.50:40 | RYR | Ryanair nine zero seven Shannon,TCAS climb. *(Climbing)* |
| 19.50:42 | RAD9 | Shannon Roger Thank you. |

## Appendix B

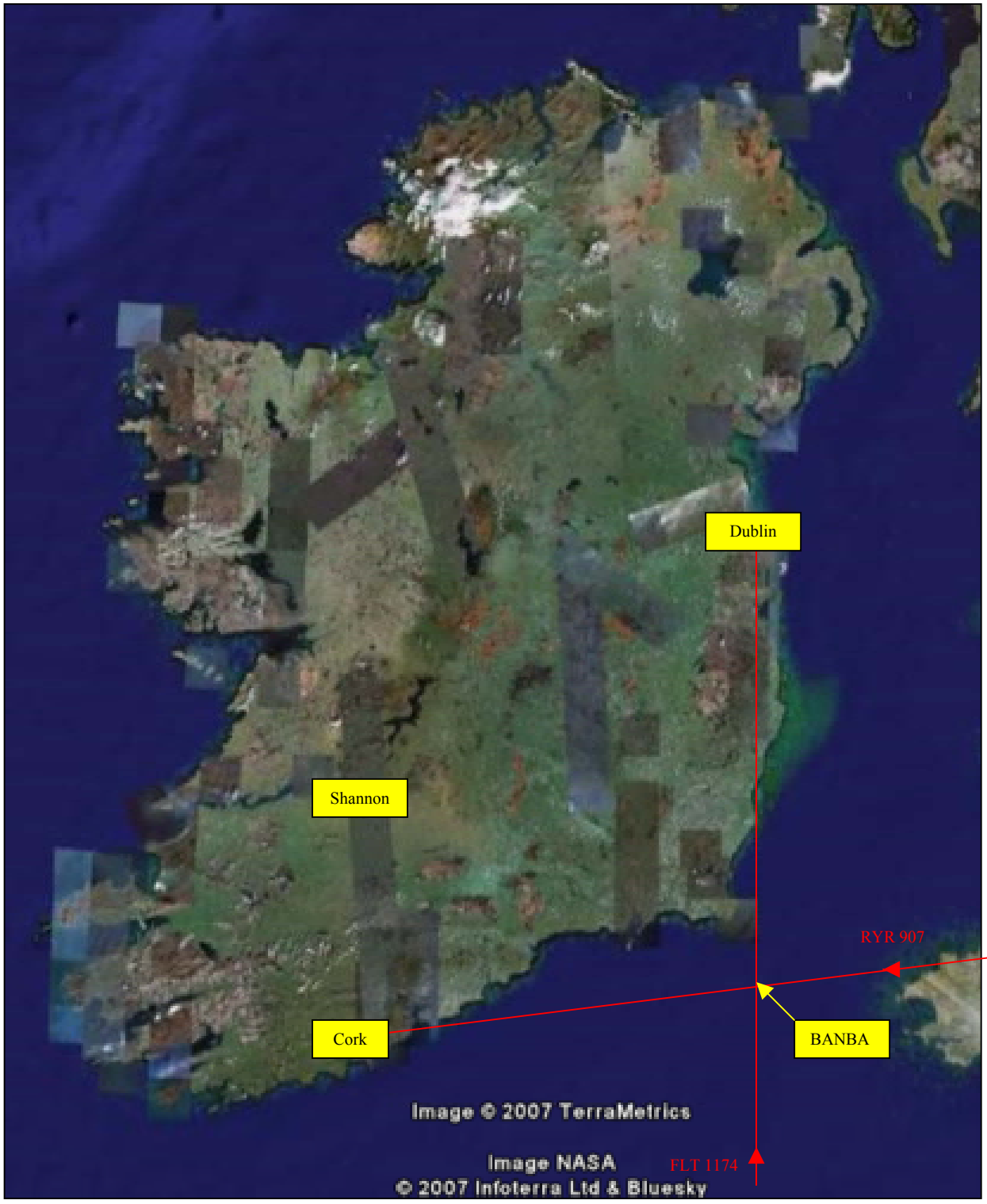


Image courtesy of Google Earth

Highlighted in yellow are Intersection BANBA and Dublin, Cork and Shannon airports. Approximate flight paths of both aircraft are also shown in red

**FINAL REPORT**

**Appendix C**

**Radar image showing STCA labels in Red**


**- END -**