

# YellowBird Phase II Trial Results

September 27

# 2013

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Phase II Trial Report for the YellowBird Advance Alert  
System designed by LX Design House for Advance Alert  
Pty Limited.

YB.1309.TR.01

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## 2 Document History

### 2.1 Prepared (LX Design House)

Date	Name	Title	Signature
26/09/2013	S. Klistorner	Embedded Systems Engineer	

### 2.2 Approved (LX Design House)

Date	Name	Title	Signature
27/09/2013	N. Fraser	Project Manager	

### 2.3 Approved (Customer representative)

Date	Name	Title	Signature

### 2.4 Revisions

Revision	Date	Author	Details	Review
1	26/09/13	S. Klistorner	Original version	N. Fraser

## 3 Executive Summary

LX Design House carried out in conjunction with representatives from ESA a Phase II Trial for the YellowBird Alert System. This Trial was conducted on 18 September 2013 in and around Canberra.

The goal of the second trial was to be able to use software to trigger two different YellowBirds, and to be able to specify exactly which YellowBird would trigger (or both). Again, the development team were confident that this would work due to the lab testing that has been undertaken by LX and the success of the first trial. The results of the Trials will be used to apply for further funding to continue development of the YellowBird Alert System with the ultimate end goal of commercialisation of the device.

The combined YellowBird, ESA, 1 Way FM & LX team were really excited about the results of these trials as they strongly indicated that the system is easily able to be implemented and had a 100% success rate.

## 4 Method

Two YellowBirds were used during these live trials. From our first trial we established that some regions of Canberra had better reception on the two different test frequencies (91.9FM and 94.3FM). As a result of this YB1 was tuned to 91.9FM and designated to the northern part of Canberra and YB2 was turned to 94.3FM and designated to the southern region of Canberra.

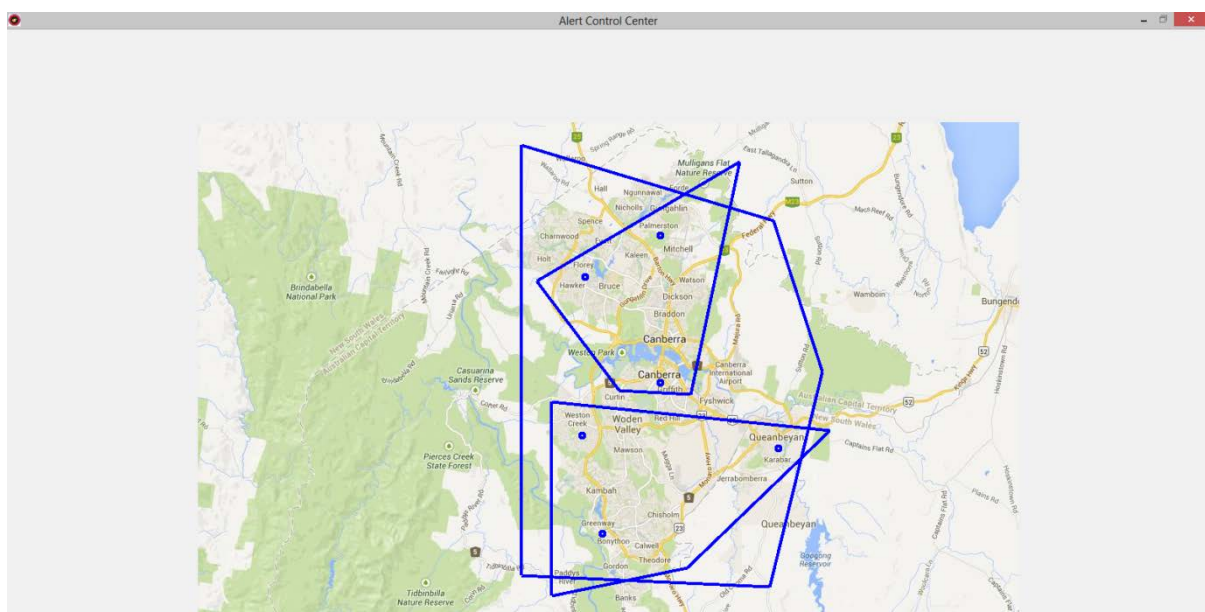
During the trial, for each 'trigger time', the two YellowBirds were driven to two different locations (YB1 in a specified location in the northern region and YB2 in a specified location in the southern region). The test personnel checked there was adequate reception in the selected trigger locations. Along with outdoor locations, residential and commercial locations were also selected (homes, hotel room and shopping centres).

When a location with adequate reception was reached the devices were turned on and left in a dormant mode. The test personnel then waited for the trigger tone to be played over the radio and recorded the results in a table. The table details the time, location, reception quality, results of the trigger and any other comments or notes. It is important to note that the devices did not always trigger as the tone may have been specified for the other device. In these circumstances this was the correct response from the device.

The software user selected a region for the trigger tone. For example the user selected to trigger only YB1 – so only YB1 would trigger while YB2 would remain dormant. When the user selected a region an email was sent to the radio station. The radio producer then queued the tone to be played just before the news segment (on the hour). The software user could also select the master region so both YellowBirds would trigger.

Two days of pre-trial testing was performed before the actual trial date on Wednesday 18<sup>th</sup> September 2013.

Below is a screenshot of the software



## 5 Pre-Trial Results (16<sup>th</sup> and 17<sup>th</sup> September 2013)

The pre-trial was carried out before the trial to determine various locations for the trial. The pre-trial was carried out by engineers from LX. Software was used to determine the trigger tones to play.

Hand held radios were used to be able to listen to the radio station while the YellowBird devices were in dormant mode to ensure the trigger was played.

Below are some images from the pre-trial to show the context of the test setup.







## 5.1 Recorded Pre-Trial Results (16<sup>th</sup> and 17<sup>th</sup> September 2013)

Date and time:	Monday 16 <sup>th</sup> Sept 11am			
Test #: 1	Trigger time:	11am	Trigger region set:	Master
Location of:	YB1 – 91.9	Belconnen Shopping center car park		
	YB2 – 94.3	Same as above		
Quality of reception (1= static, 5= excellent)	YB1 – 91.9	4	Radio 1 – 91.9	4
	YB2 – 94.3	0	Radio 2 – 94.3	0
Trigger	YB1 – 91.9	✓	YB2 – 94.3	✗
<b>Notes:</b> <u>Result: NOT triggered as expected as YB2 had no reception. Given this it is reasonable that YB2 did not trigger.</u> Weather: Overcast weather YB2 had no reception				

Date and time:	Monday 16 <sup>th</sup> Sept midday			
Test #: 2	Trigger time:	Midday	Trigger region set:	North Only
Location of:	YB1 – 91.9	Park near Meryn's house		
	YB2 – 94.3	Same as above		
Quality of reception (1= static, 5= excellent)	YB1 – 91.9	4	Radio 1 – 91.9	4
	YB2 – 94.3	0	Radio 2 – 94.3	0
Trigger	YB1 – 91.9	✓	YB2 – 94.3	✗
<b>Notes:</b> <u>Result: triggered as expected</u> Weather: Raining				

<b>Date and time:</b>	Monday 16 <sup>th</sup> Sept 1pm			
<b>Test #: 3</b>	<b>Trigger time:</b>	1pm	<b>Trigger region set:</b>	South only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Skate park at the end of Dillon close Weston Creek		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	4	<b>Radio 1 – 91.9</b>	4
	<b>YB2 – 94.3</b>	4	<b>Radio 2 – 94.3</b>	3
<b>Trigger</b>	<b>YB1 – 91.9</b>	✗	<b>YB2 – 94.3</b>	✓
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining. Have a video of this trigger Good location.				

<b>Date and time:</b>	Monday 16 <sup>th</sup> Sept 2pm			
<b>Test #: 4</b>	<b>Trigger time:</b>	2pm	<b>Trigger region set:</b>	South only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Greenway – Bonnin Pl, Bonython. Cul-de-sac		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	4	<b>Radio 1 – 91.9</b>	2
	<b>YB2 – 94.3</b>	4	<b>Radio 2 – 94.3</b>	4
<b>Trigger</b>	<b>YB1 – 91.9</b>	✗	<b>YB2 – 94.3</b>	✓
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining OK location				

<b>Date and time:</b>	Monday 16 <sup>th</sup> Sept 3.40pm			
<b>Test #: 5</b>	<b>Trigger time:</b>	3:40pm	<b>Trigger region set:</b>	North Only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Meryn's Place in Florey. Indoors		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	5
	<b>YB2 – 94.3</b>	2	<b>Radio 2 – 94.3</b>	2
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓	<b>YB2 – 94.3</b>	✗
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining Test setup was on a table inside a house.				

<b>Date and time:</b>	Monday 16 <sup>th</sup> Sept 4pm			
<b>Test #: 6</b>	<b>Trigger time:</b>	415pm	<b>Trigger region set:</b>	North Only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Inside my car. Leisler close Palmerston		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	4
	<b>YB2 – 94.3</b>	4	<b>Radio 2 – 94.3</b>	2
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓	<b>YB2 – 94.3</b>	✗
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining Test done inside the car as no cover from the rain Hand held radio was not that good but YellowBird appeared to have sufficient reception				

<b>Date and time:</b>	Monday 16 <sup>th</sup> Sept 5pm			
<b>Test #: 7</b>	<b>Trigger time:</b>	5pm	<b>Trigger region set:</b>	Master
<b>Location of:</b>	<b>YB1 – 91.9</b>	Realms Hotel (level 1)		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	4	<b>Radio 1 – 91.9</b>	3
	<b>YB2 – 94.3</b>	0	<b>Radio 2 – 94.3</b>	1
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓	<b>YB2 – 94.3</b>	✓ <sup>1</sup>
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining Reception was poor inside the hotel room. When YB2 was pointed towards the floor, reception was around 2/5. When the tone was played the second time the unit triggered (YB2 was held correctly).				

<b>Date and time:</b>	Tuesday 17 <sup>th</sup> Sept 10am			
<b>Test #: 8</b>	<b>Trigger time:</b>	10am	<b>Trigger region set:</b>	Master
<b>Location of:</b>	<b>YB1 – 91.9</b>	Shopping Center Food court – Canberra Center		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	4	<b>Radio 1 – 91.9</b>	4
	<b>YB2 – 94.3</b>	1	<b>Radio 2 – 94.3</b>	1
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓ ✓	<b>YB2 – 94.3</b>	✓ ✓
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining Located between Sushi World and KFC on the food court. On the last wooden table. There is really bad reception for 94.3FM, the reception is around 3 if held correctly. If held correctly the device will trigger.				

<sup>1</sup> YB2 triggered the second time the tone was played when there was better reception. The first failure was due to poor reception (only a rating of 2/5).

<b>Date and time:</b>	Tuesday 17 <sup>th</sup> Sept Midday			
<b>Test #: 9</b>	<b>Trigger time:</b>	Midday	<b>Trigger region set:</b>	South only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Dillon Close – Greenway		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	4
	<b>YB2 – 94.3</b>	5	<b>Radio 2 – 94.3</b>	3
<b>Trigger</b>	<b>YB1 – 91.9</b>	✗ ✗	<b>YB2 – 94.3</b>	✓ ✓
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining				

<b>Date and time:</b>	Tuesday 17 <sup>th</sup> Sept 1pm			
<b>Test #: 10</b>	<b>Trigger time:</b>	1pm	<b>Trigger region set:</b>	Master
<b>Location of:</b>	<b>YB1 – 91.9</b>	Narrabundah – Virginias Suburb. Neighbourhood oval		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	5
	<b>YB2 – 94.3</b>	3	<b>Radio 2 – 94.3</b>	2
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓ ✓	<b>YB2 – 94.3</b>	✓ ✓
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining Test done inside of the car due to rain. Location not recommended for Trials.				

<b>Date and time:</b>	Tuesday 17 <sup>th</sup> Sept 2pm			
<b>Test #: 11</b>	<b>Trigger time:</b>	2pm	<b>Trigger region set:</b>	Master
<b>Location of:</b>	<b>YB1 – 91.9</b>	Queenbeyan – Queenbeyan Park		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	5
	<b>YB2 – 94.3</b>	5	<b>Radio 2 – 94.3</b>	5
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓ ✓	<b>YB2 – 94.3</b>	✓ ✓
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining Undercover. Good location for testing Video recorded here				

<b>Date and time:</b>	Tuesday 17 <sup>th</sup> Sept 3pm			
<b>Test #: 12</b>	<b>Trigger time:</b>	3pm	<b>Trigger region set:</b>	South Only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Fyshwick – Outside Office Works in the car park		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	4
	<b>YB2 – 94.3</b>	5	<b>Radio 2 – 94.3</b>	4
<b>Trigger</b>	<b>YB1 – 91.9</b>	✗ ✗	<b>YB2 – 94.3</b>	✓ ✓
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Raining Test conducted in car				

<b>Date and time:</b>	Tuesday 17 <sup>th</sup> Sept 4pm			
<b>Test #: 13</b>	<b>Trigger time:</b>	4pm	<b>Trigger region set:</b>	North Only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Palmerston – Leisler place		
	<b>YB2 – 94.3</b>	Same as above		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	4
	<b>YB2 – 94.3</b>	3	<b>Radio 2 – 94.3</b>	2
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓ ✓	<b>YB2 – 94.3</b>	✗ ✗
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> Weather: Light rain Same place as Mondays test First passed in the car. Second pass was in the park on the table.				

## 6 Trial Results (Wednesday 18<sup>th</sup> September 2013)

For the live trial, two ESA (Emergency Services Agency) ACT personnel drove to specified locations around Canberra to setup the YellowBird devices. A user at ESA ACT used the software to set different regions to trigger. 1WAY FM confirmed they received the trigger tone and queued the specified tone in their play list. The two ESA personnel then recorded their results.

The results are tabulated below. Note that the results are a combination of the drivers and the software operator.

### 6.1 Recorded Trial Results (Wednesday 18<sup>th</sup> September 2013)

Date and time:	Wednesday 18 <sup>th</sup> Sept 10am			
Test #: 1	Trigger time:	10am	Trigger region set:	Master
Location of:	YB1 – 91.9	Just outside the airport		
	YB2 – 94.3	Weston Creek		
Quality of reception (1= static, 5= excellent)	YB1 – 91.9	3	Radio 1 – 91.9	4
	YB2 – 94.3	5	Radio 2 – 94.3	5
Trigger	YB1 – 91.9	✓ ✓	YB2 – 94.3	✓
<b>Notes:</b> <u>Result: triggered as expected</u> YB1 – did not reach location ‘Hotel Realms’ so the test was performed on the side of the road near the airport YB2 – only on for one trigger. Not on for the second trigger. Outdoors, cool, windy, cloudy				

Date and time:	Wednesday 18 <sup>th</sup> Sept 11am			
Test #: 2	Trigger time:	11am	Trigger region set:	South only
Location of:	YB1 – 91.9	Hotel Realms		
	YB2 – 94.3	Greenway		
Quality of reception (1= static, 5= excellent)	YB1 – 91.9	---	Radio 1 – 91.9	3
	YB2 – 94.3	5	Radio 2 – 94.3	5
Trigger	YB1 – 91.9	✗ ✗	YB2 – 94.3	✓
<b>Notes:</b> <u>Result: triggered as expected</u> YB2 – only on for one trigger. Not on for the second trigger. Cool, windy and cloudy.				

<b>Date and time:</b>	Wednesday 18 <sup>th</sup> Sept midday			
<b>Test #: 3</b>	<b>Trigger time:</b>	Midday	<b>Trigger region set:</b>	North Only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Realms Hotel		
	<b>YB2 – 94.3</b>	Banks		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	5
	<b>YB2 – 94.3</b>	---	<b>Radio 2 – 94.3</b>	---
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓ ✓	<b>YB2 – 94.3</b>	✗ ✗
<b>Notes:</b> <u>Result: triggered as expected.</u> YB1 – radio reception improved from the previous hour even though it was in the exact same location. Maybe reception changes through-out the day				

<b>Date and time:</b>	Wednesday 18 <sup>th</sup> Sept 1pm			
<b>Test #: 4</b>	<b>Trigger time:</b>	1pm	<b>Trigger region set:</b>	Master
<b>Location of:</b>	<b>YB1 – 91.9</b>	Florey - Residential		
	<b>YB2 – 94.3</b>	Kambah – residential		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	5
	<b>YB2 – 94.3</b>	5	<b>Radio 2 – 94.3</b>	5
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓ ✓	<b>YB2 – 94.3</b>	✓ ✓
<b>Notes:</b> <u>Result: triggered as expected</u>				

<b>Date and time:</b>	Wednesday 18 <sup>th</sup> Sept 2pm			
<b>Test #: 5</b>	<b>Trigger time:</b>	2pm	<b>Trigger region set:</b>	South Only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Palmerston		
	<b>YB2 – 94.3</b>	Greenway –Shopping Centre		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	5	<b>Radio 1 – 91.9</b>	5
	<b>YB2 – 94.3</b>	5	<b>Radio 2 – 94.3</b>	5
<b>Trigger</b>	<b>YB1 – 91.9</b>	✗ ✗	<b>YB2 – 94.3</b>	✓
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> The first trigger for YB2 did not go off as the YellowBird was in a poor reception area. When the bird was taken to a good reception area the YellowBird triggered.				

<b>Date and time:</b>	Wednesday 18 <sup>th</sup> Sept 3pm			
<b>Test #: 6</b>	<b>Trigger time:</b>	3pm	<b>Trigger region set:</b>	North Only
<b>Location of:</b>	<b>YB1 – 91.9</b>	Canberra Centre (shopping centre)		
	<b>YB2 – 94.3</b>	Queenbeyan		
<b>Quality of reception</b> (1= static, 5= excellent)	<b>YB1 – 91.9</b>	4	<b>Radio 1 – 91.9</b>	3
	<b>YB2 – 94.3</b>	---	<b>Radio 2 – 94.3</b>	---
<b>Trigger</b>	<b>YB1 – 91.9</b>	✓ ✓	<b>YB2 – 94.3</b>	✗ ✗
<b>Notes:</b> <u><b>Result: triggered as expected</b></u> YB2 – partially cloudy				

## 7 Conclusion

The test results confirmed that when a YellowBird is in good reception area it will respond depending on the code played on the radio. YB1 only triggered when the software user selected the North region or the Master region, and YB2 only triggered when the South or Master region was selected. This trial also proved that the link between the software operator and the radio station was successful and the radio station can queue the tones required within several minutes of receiving the tone. There were no false triggers or missed triggers. The YellowBirds had a 100% success rate during the live trial.

Given these results the engineering team believe with great confidence that with further research and development this device can provide an effective, reliable emergency alert system.

## 8 Recommendations

LX recommends extending the trial size. This would include the design and development of commercial level prototypes of around 100-200 Yellow Birds and further development of the software. Further details can be provided on request.