

Amelia Earhart – 70th Anniversary of the World Flight

by Claudio "Cloudy" Di Veroli, published in PC FLIGHT,
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A few months ago was the 70th Anniversary of the sad disappearance of Amelia Earhart and Frederick Noonan. This article is meant to pay respects to them and give directions in order to replicate their World Flight in Flight Simulator FS2004. A few hints are also given for Flight Simulator X.

THE HISTORIC WORLD FLIGHT OF 1937



Fig. 1 – Amelia Earhart and the World Flight map

Fig. 1 shows a portrait of Amelia Earhart's with the background of the map with her flight route. Details of her life and exploits are available from many web sites, and I quote the excellent summary from www.tighar.org/Projects/Earhart/AEoverview.html

(TIGHAR is The International Group for Historic Aircraft Recovery):

"At the time of her disappearance, Amelia Earhart was arguably the most famous woman of her generation and is, even today, certainly the most well-known woman aviator of all time. As the first woman passenger to cross the Atlantic by air in 1928, and the first pilot to fly the Atlantic since Lindbergh in 1932, she established herself as a major figure in an era when aviation was making daily headlines. . . . she took delivery of a twin-engined Lockheed Model 10E Special "Electra" which had been equipped with extra fuel tanks for long range flights, and in 1937 she set out to be the first person to circle the globe by air close to the equator. . . . Her companion was the finest aerial navigator of the day, Frederick J. Noonan. . . . Together, Earhart and Noonan flew the Electra across the United States from Oakland to Miami, across the Caribbean to South America, then across the South Atlantic to Africa. Flying over the trackless Sahara, they continued around the tip of Arabia and on up to India. They flew across the sub-continent and down through Southeast Asia, through what was then the Netherlands East Indies, to northern Australia and finally eastward to Lae, New Guinea. It had taken almost exactly a month to travel from Miami to New Guinea. Now they faced the longest and most difficult leg of the entire journey: the 2,500 mile jump to Howland Island, a minuscule coral outcropping in mid-Pacific where a runway had been carved out and the Coast Guard cutter *Itasca* was waiting to refuel the Lockheed for the flight to Hawaii. From there she would fly to Oakland to complete the world flight. But Earhart and Noonan did not arrive at Howland Island. As she approached the island on the morning of July 2nd, after 19 hours in the air, the radio operators aboard the *Itasca* could clearly hear her attempts to contact them, but it soon became tragically apparent that she was not able to hear their replies."

A short film of their last takeoff, from Lae in New Guinea, can be watched online from www.tighar.org/Projects/Earhart/ameliaavideo.html. The transmissions from Earhart were heard from the *Itasca* for eight hours, but she was never able to hear the *Itasca* except for a brief final transmission. This was largely because she had decided – for load reasons – not to carry in the world flight her low-frequency transmitter. To make matters worse, in the last flight, also to save fuel, she removed a few items, including her booklet on radio frequencies. Last but not least, the film above shows a detail that seems to suggest that part of the aerial was damaged during the last take-off from Lae. It is also known that Noonan had been drinking heavily prior to the flight, which perhaps explains why it was Earhart who manned the radio. She also made the fatal mistake to shut the radio after each brief message, unaware that long messages were needed before the *Itasca* could locate the direction where the signal was coming from. After the contact was lost, a fully fledged expedition was immediately organised by the U. S. Navy, but eventually no remnants of the aircraft or its crew were ever found, whether on sea or on the adjacent islands.

Many reproductions of the World Flight route map are available online, e.g. the one shown below, which is actually an interactive map available online in www.lib.purdue.edu/spcol/aearhart/map/map.html that gives details of each of the airports/waypoints.



Fig. 2 – World Flight Route

THE 30TH AND 60TH ANNIVERSARY RE-CREATIONS

Earhart's 1937 flight was re-created in two occasions, completing it back to Oakland as per Earhart's plan. In 1967 Ann Pellegrino and a crew of three for the first time completed the flight, though they used a L10-A aircraft. In 1997 Linda Finch did it flying a restored L-10E from 1935, identical to the model used by Earhart and Noonan, and one of the only two such surviving aircraft. A few details of her flight are available online from www.allstar.fiu.edu/aero/finch.htm.

THE LAST SEARCH EXPEDITION OF 2007

After 1937 and again after World War II, a few expeditions combed – unsuccessfully – the zone looking for the wreckage and/or the crew. In September 2001 TIGHAR within its "Earhart Project" organised the search expedition Niku III. Plenty of details can be found online in www.tighar.org/Projects/Earhart/NikuIIISumm.html

Six years later and in occasion of the 70th anniversary of the flight, this September 2007 TIGHAR completed the Niku V. A full report is now available from www.tighar.org/Projects/Earhart/NikuV/NikuV.html



Fig. 3 – TIGHAR's Niku V Earhart Project badge

In a nutshell, for decades it was thought that Earhart's L-10E had ditched in deep oceanic waters not too far from its destination, Howland Island. In recent years however, TIGHAR's and previous expeditions were able to find in Nikumaroro (then called Gardner Island and uninhabited, located about 300nm south of Howland Island) "*artifactual evidence that strongly suggested that the island was where Earhart and Noonan met their fate*".

The artifacts found so far include a piece of Plexiglas that matches a corner of one of the airplane windows, a skeleton (now lost) with measures matching Earhart's, a wooden box identical to the one used by Noonan to carry his sextant, and many small pieces of metal typically produced in the USA in the '30s.

FLIGHT SIMULATOR 98

I was still living in Argentina when in December 1998, while visiting England, I made the most important acquisition of my trip: Nick Dargahi's masterwork "The Ultimate Flight Simulator", just out of the press. This mammoth book, 1003 pages long, was a true treasure trove, especially in times where the old phone modems put a very stringent limit on what could be found and downloaded from the web. In Dargahi's book I found material for over a year of marvellous moments flying the then state-of-art FS98.

One of the highlights of Dargahi's "The Ultimate Flight Simulator" was his extensive coverage of Amelia Earhart's World Flight. He devoted to the matter the last of his book's chapters: Chapter 17 "The Great Adventure of Amelia Earhart". Find there:

- a general description of the flight
- a short description of the 1997 real-life re-creation
- ROUTE: step by step details with full information on each waypoint/airport (including modern navaids)
- how to install a GPS as an add-on to FS98, as an aid for the flight
- SCENERY: how to install and use the Amelia Earhart Scenery for FS98 by Alfred Grech. This freeware was included in the book's CDROM. It carries 16 needed airports that are not included in the default FS98.
- AIRCRAFT: how to install and use the L-10E aircraft for FS98 by Goetz Scheuermann. This freeware was also included in the book's CDROM.
- SPECS: Full technical data of the L-10E aircraft especially airspeeds.

In the Previous Chapter 14 "Great Circle Navigation" Dargahi describes the tool to find the magnetic heading between two airports or waypoints of known coordinates. A fully-fledged spreadsheet by Alan Parkinson was included in the CDROM. I spent quite a few weekends re-creating the flight, mostly using Great Circle navigation as Noonan would have done.

FLIGHT SIMULATOR 2004

The add-ons needed to reproduce the World Flight of 1937 in FS2004 are available online as freeware. Find below an analysis: only the first two downloads are absolutely needed, though I also find most useful the other 4 mentioned below.

"FS2004 Amelia Earhart's 1937 World Flight"

Filename: aewfv01.zip, Size: 1,6 Mb, Date: May 2006, Author: Charles Wood.

This freeware can be downloaded from either www.avsim.com or www.flightsim.com . It includes:

- SCENERY: three airports (just the runways and NDBs) which are missing from FS2004 because they no longer exist nowadays. They are: Caripito in Venezuela, Lae in New Guinea and Howland Island in the Pacific.
- A full map, of which we reproduce a low-resolution view in Fig. 4
- ROUTE: the details of the route step by step with full information on each waypoint/airport (including modern navaids)

[A separate freeware is available with a fully detailed scenery of Howland Island as it was in 1937. This has a very complex install, and I do not see the point in taking all that trouble for a place where Earhart never landed, and which nowadays - every human construction having been completely demolished - is again just the minuscule rocky outcrop shown by default in FS2004.]

Amelia Earhart's 1937 World Flight Route

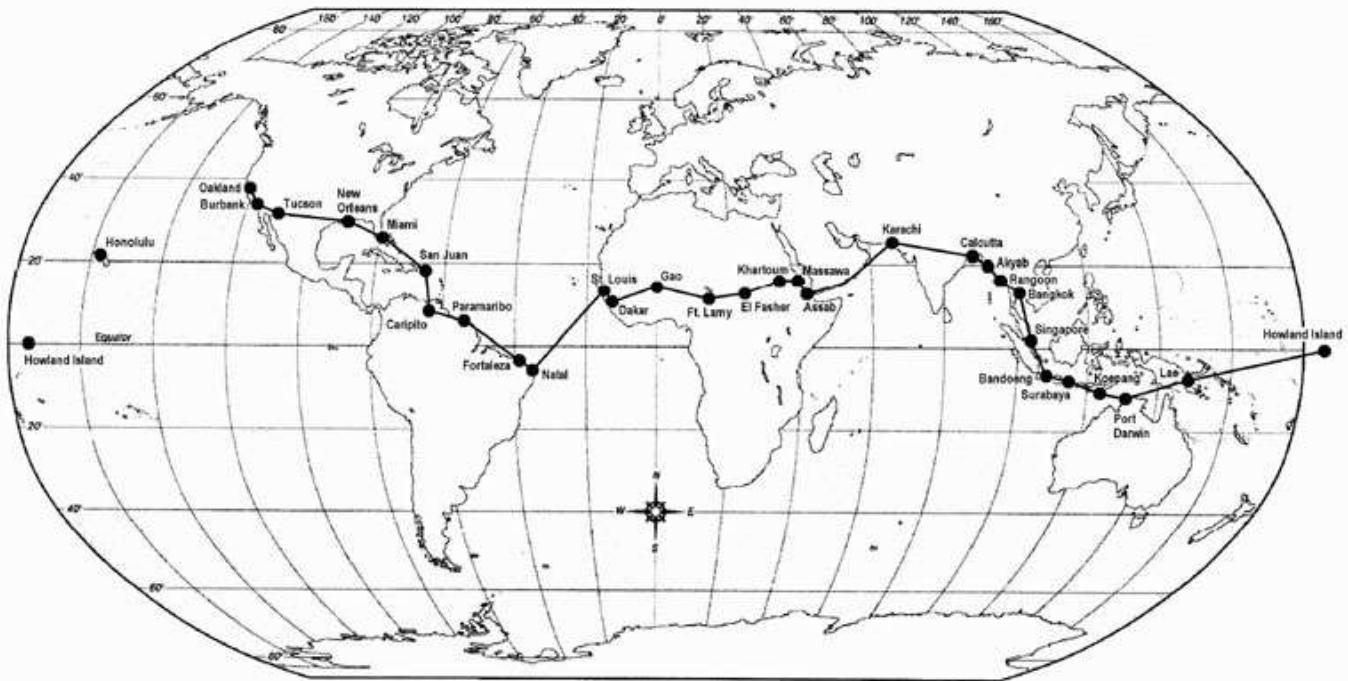


Fig. 4 – World Flight Map included in aewfv01.zip

“FS2004 Amelia Earhart's L10E Electra”

Filename: L10eae01.zip, Size: 10 Mb, Date: May 2006, Authors Dave Bitzer, Norman Hancock, J.L. Stubbs and Charles Wood. Available from the same sites as above and also from www.bobholland.com/fs/aircraft.htm

This is an upgrade of Arik Hohmeyer's L10E from FS-Design Berlin. *The intent was to match it as closely as possible to Earhart's L10E Lockheed Electra. Dave Bitzer's research at the Smithsonian Institute and independent work by Alex Nicolson resulted in over two-dozen flight-dynamics changes, including proper-capacity long range tanks. Norman Hancock designed two custom panels for this historic aircraft; a classic version with a Sperry AP and a modern one with a digital AP and more navigation equipment. The Cambridge Engine Analyzer, Sextant, Drift Meter, and pop-up E6-B computer are standard on both panels. Easy one-step install.*

See in Fig. 5 below a screenshot of the aircraft as seen in FS2004. Both the external model and the flight dynamics have been very carefully reproduced. Beautiful to watch on screen, the simulated aircraft behaves in a very realistic way, and comparisons with similar period aircraft in FS2004 show clearly the lack of manoeuvrability due to the large fuel load. In spite of that this model takes off, lands and taxies quite well, especially using rudder pedals with toe brakes.

SPECS: The checklists and ref files installed are most interesting, but they are not complete, nor am I completely happy with them. To give an example, at the very beginning of the checklist it advises to fly with partial load in the fuselage tank to avoid overloading the aircraft above the nominal 10,500 lbs of MTOW. Yet it is a fact that Earhart did it in more than one occasion, and this model takes off with no problems with full tanks at a total gross weight of almost 14,400 lbs. Based on the technical info available, I have now produced and flight-tested a full set of checklists which is available as a free download from http://cloudy.braybaroque.ie/cloudy_checklists/checklists.htm.



Fig. 5 - FS2004 Amelia Earhart's L10E Electra

SEXTANT AND DRIFTMETER: As in the original airplane, a Sextant – quite difficult to use – and a Driftmeter – very easy to use – are included, with full manuals. The Driftmeter is a very simple and interesting tool: you just watch the ground and measure the direction in which buildings or other features move (with no wind, everything moves straight from front to back, otherwise there is a drift). I tried with wind from 360° at 16 knots, flying at 110 kts. My E6B gave me a drift of 7°. The Driftmeter gave me 6°. Not so bad. The Driftmeter is not as precise as the E6B, but the latter (except perhaps to plan landing with strong crosswinds as advised from a control tower) is largely a theoretical tool, because in real uncontrolled flight you have no idea of the wind speed or direction! The Driftmeter instead does not bother with the wind parameters: it just measures its practical effect and tells you straight away how to compensate for it. And it can be used very well by a navigator even if the wind is changing constantly.

2D PANELS: In spite of the two exceptional gauges mentioned above, I am less than ecstatic with the two panels provided with L10eae01.zip, named "modern" and "Sperry". Though they do include the necessary gauges, their layout and background is admittedly primitive, and most gauges look definitely too modern for 1937. Even worse, as usual, too many essential gauges are not in the main panel – e.g. the throttle quadrant – forcing the PC pilot to continually pause the flight and press keys or click icons to get at essential groups of gauges ... which then obstruct either the external view or other gauges! As for their mini-panel – so useful to PC pilots – it sports 6 gauges only. To fix those problems, I have produced my own panel as a suitable modification of my DC3 panel, using some of the excellent historical default DC3 gauges, while using also some of the best gauges from L10eae01.zip. My panel is only functional if installed as an add-on to the latter, therefore no copyright is infringed. After the L10eae01.zip aircraft is installed with its two panels, my panel installs as a third alternative.



Fig. 6 – L-10E's Sperry panel



Fig. 7 – L-10E's Cloudy panel

VIRTUAL COCKPIT: L10eae01.zip does not carry a Virtual Cockpit, but one was developed later as an upgrade, and is available as ael10vc1.zip, either from www.flightsim.com or from www.simaviation.com/fs2004vintage59.htm. Inside it is an .exe installer, but it is a standard compressed file mimicking the FS9 structure: this is good because you can use it either to add and change files automatically, or to unzip anywhere and do the changes manually, useful in case you have edited the "Sperry panel" to suit your tastes. This Virtual Cockpit will NOT install automatically into my panel, but you can easily do it by simply copying and pasting the necessary sections into my panel.cfg file. Anyway it has many glitches, e.g. gauges displaced with respect of their "background hole" and switches that should be clickable but aren't. Finally, though there is no information online on the special layout of the World Flight panel, a few of historical blurry photos - like the one shown in Fig. 9 below - cast doubts on the authenticity of this panel's layout.



Fig. 8 – L-10E’s Virtual cockpit



Fig. 9 – L-10A’s historical cockpit

GREAT CIRCLE NAVIGATION: Find in www.andrew-gray.com/dist/ two alternatives: both an online calculator and a downloadable spreadsheet.

FLIGHT SIMULATOR X

Many of the above tools can be used in FSX as well. Unfortunately, the two basic add-ons needed—scenery and aircraft—are not available yet for FSX. My suggestions are as follows.

SCENERY: There is no specific add-on available. The airports missing will be the same as for FS2004. For users of both FS2004 and FSX, I suggest to install the FS2004 scenery to see where the airstrips are located and perhaps to take a few screenshots. It is then merely a matter of flying FSX and “make do” landing on bare terrain.

AIRCRAFT: Quite surprisingly—in view of the publicity given to the World Flight’s 70th Anniversary—no specific L-10E add-on is available yet for FSX. Among FSX’s default aircraft, the nearest to the L-10E is of course the Douglas DC-3, a larger and different machine. My suggestion is to use the FS2004 download described above, which should work in FSX as well. Possible issues (some of them extracted from a forum):

- File structure – different (but easy to fix)
- Panel - a fix is usually needed to avoid the squashed view (easy to do)
- Screen - you need to create a picture for aircraft selection (easy)
- Gauges - FSX needs 'standard' XML gauges. This is not a problem here: the only old-type .gau gauges used in L10eae01.zip are the digital readouts which are obviously not needed.
- Models - sometimes these will need to be changed, e.g. when 'black bits' happen.
- Textures - generally OK, but some formats are not supported by FSX.

The last two items – Models and Textures – are the only ones where a problem can arise. I cannot test the above as I am not a FSX user, and have failed to find any such evidence online. I will be grateful if any reader tries and tells us his/her experience in customising the L10eae01.zip for FSX.

CONCLUSION

70 years later, we all are still amazed by Amelia Earhart’s achievements in her short life and by her tragic end. Nowadays Flight Simulation tools give us incredible “time travel” capabilities as we have seen above. Our “World Flight” experience will be enhanced by a suitable world scenery, such as improved ground textures e.g. by using Flight1’s Ground Environment for FS2004, and an accurate elevation mesh such as the one provided by Pilot’s FS Global X 2008 (which comes with two sets of DVD’s, one for FS2004, the other for FSX).

All this makes a compelling case for all of us lovers of early aircraft to devote the necessary time and effort to install the tools mentioned above, and to pay our homage to Earhart by reproducing her last adventure in our PCs.

