

Amelia Earhart Mystery

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1. Introduction

Amelia Mary Earhart (born July 24, 1897 – disappeared July 2, 1937, declared dead January 5, 1939) was an American aviation pioneer and author. During an attempt to make a circumnavigational flight of the globe in 1937 in a Lockheed Model 10-E Electra, Earhart and navigator Fred Noonan disappeared over the central Pacific Ocean near Howland Island (https://en.wikipedia.org/wiki/Amelia_Earhart).

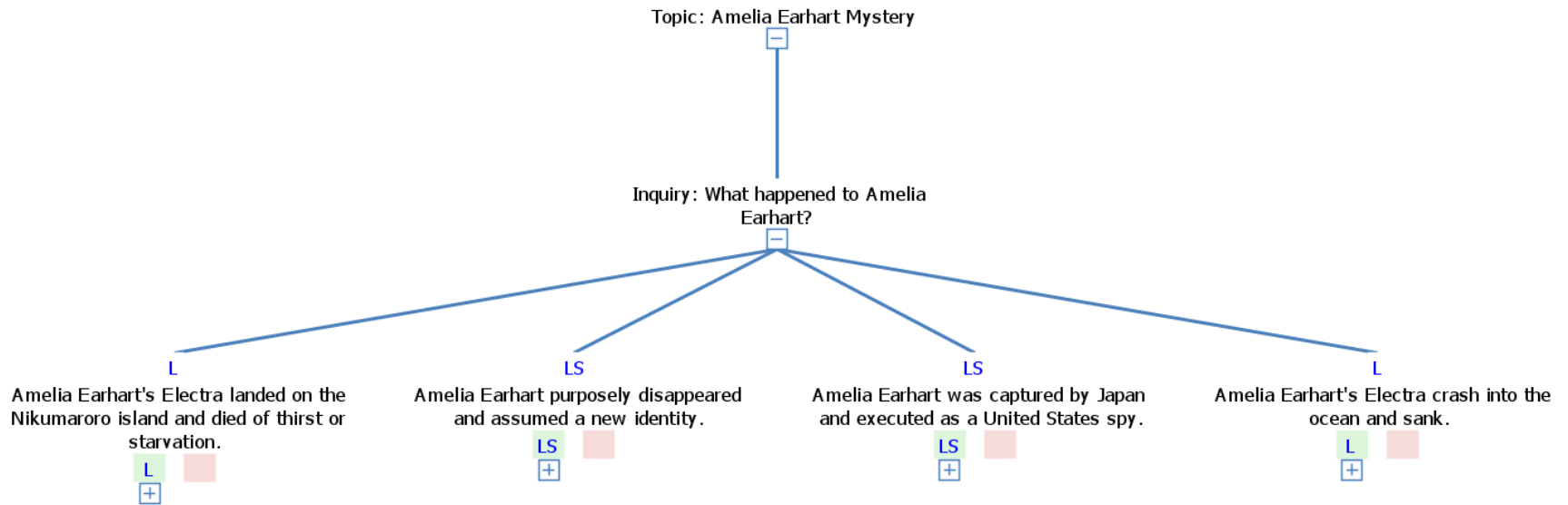
The aim of this exercise is to explore various theories on Amelia Earhart's disappearance by developing evidence-based argumentations. Section 2 presents the inquiry and Section 3 presents the corresponding argumentation developed with the sInvestigator system. sInvestigator may be downloaded from <http://lac.gmu.edu/sInvestigator/>. The knowledge base containing the argumentation may be downloaded from <http://...>

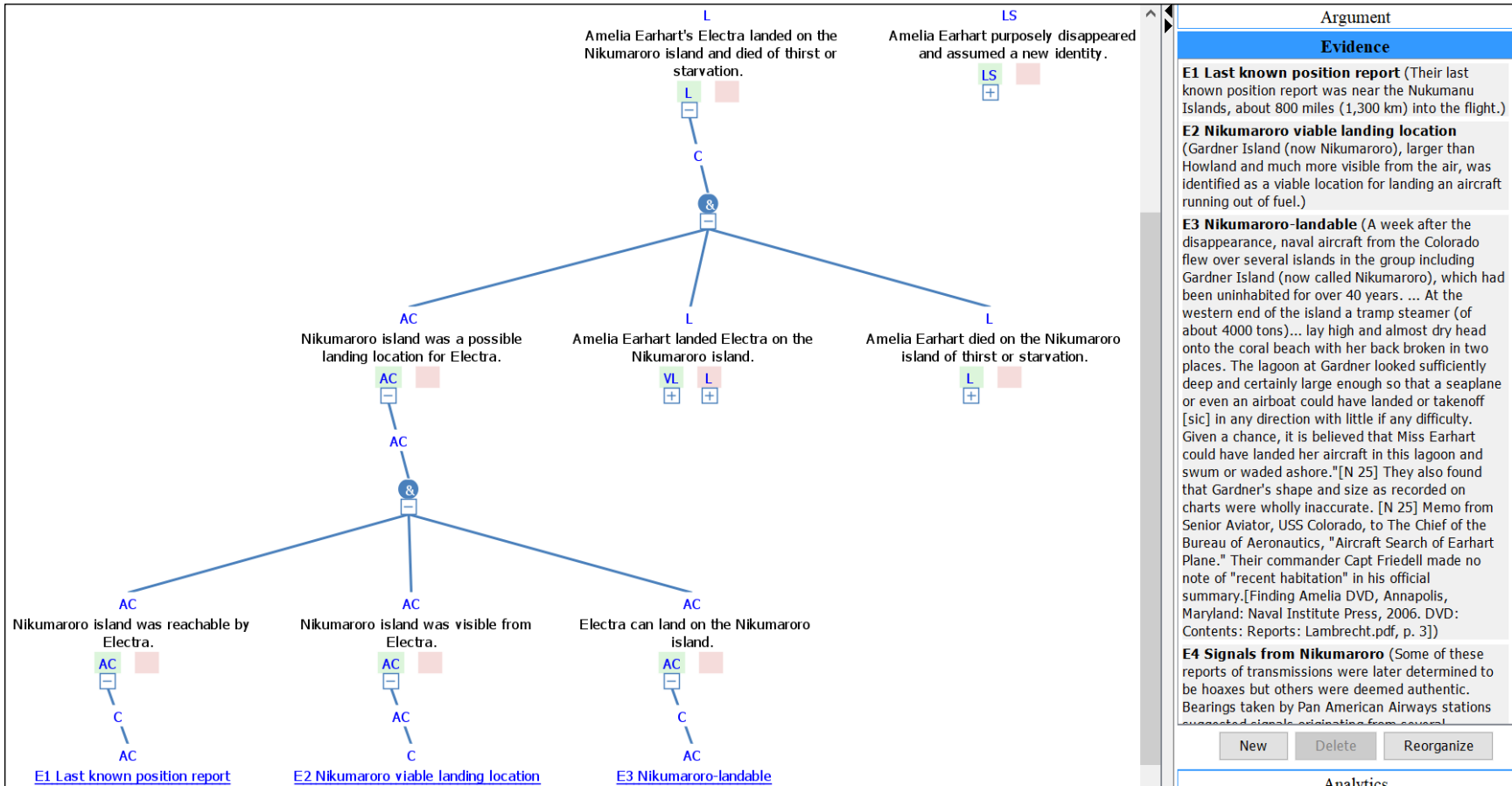
2. Inquiry: What happened to Amelia Earhart?

Four possible answers are explored:

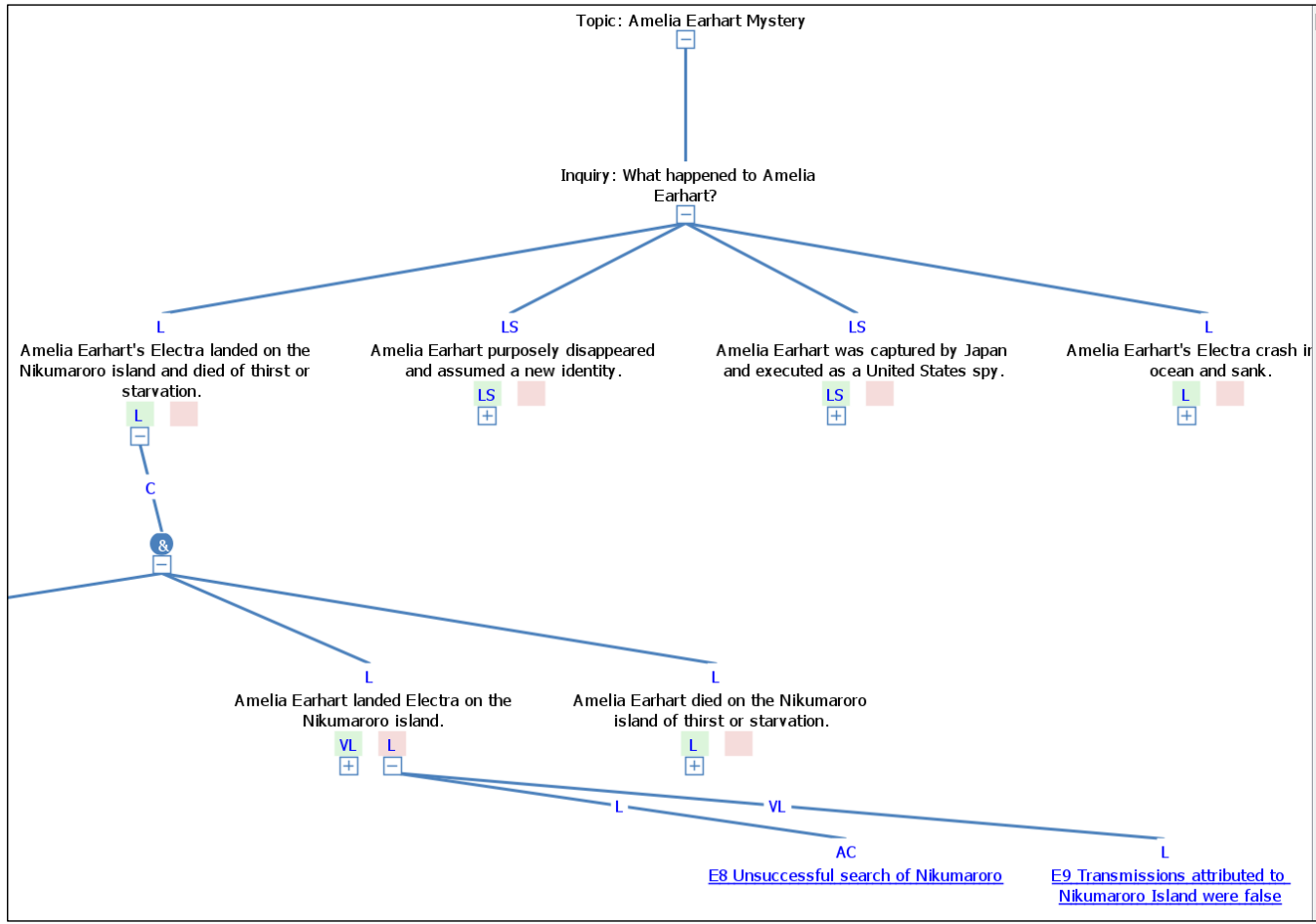
- Amelia Earhart's Electra landed on the Nikumaroro island and died of thirst or starvation.
- Amelia Earhart purposely disappeared and assumed a new identity.
- Amelia Earhart was captured by Japan and executed as a United States spy.
- Amelia Earhart's Electra crash into the ocean and sank.

3. Analysis

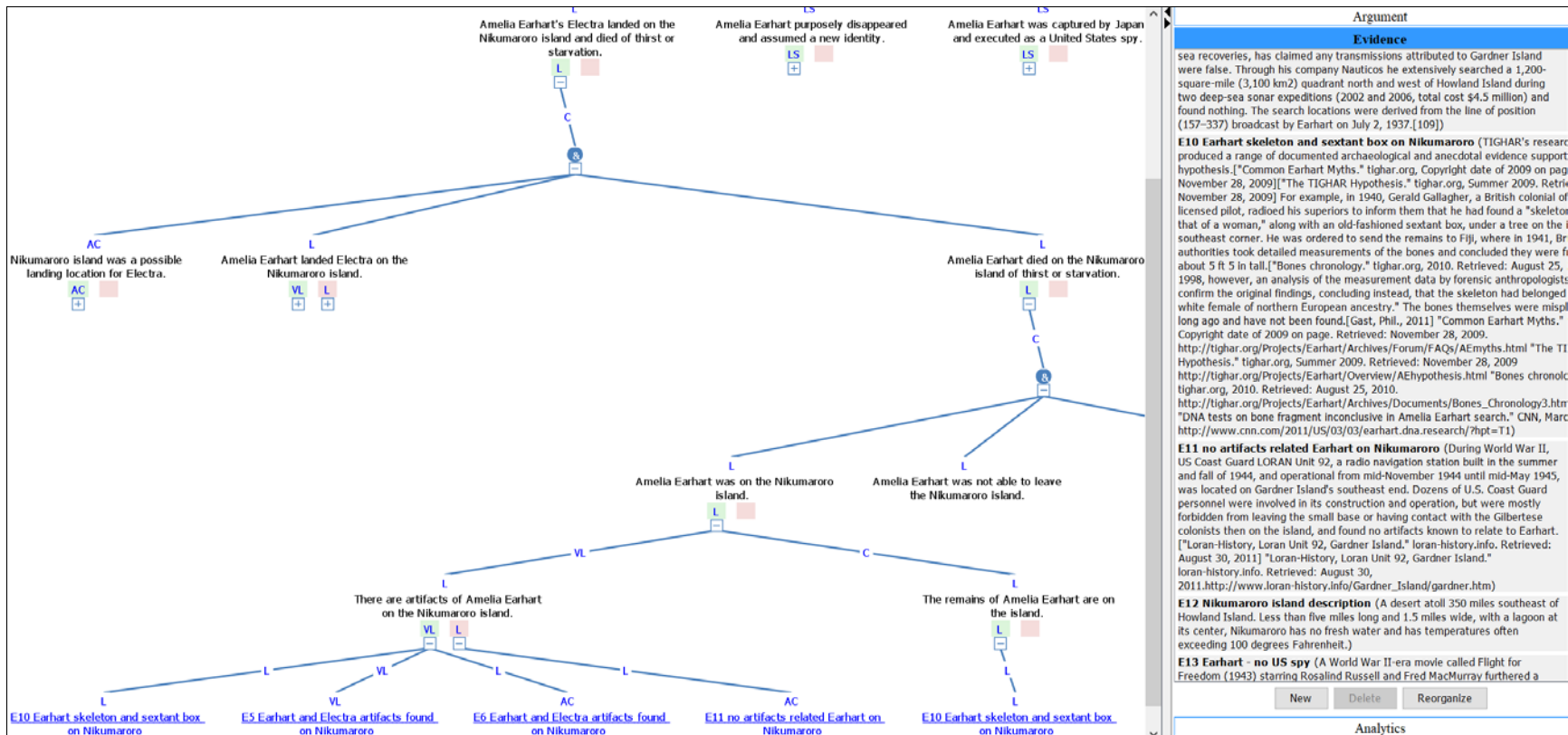


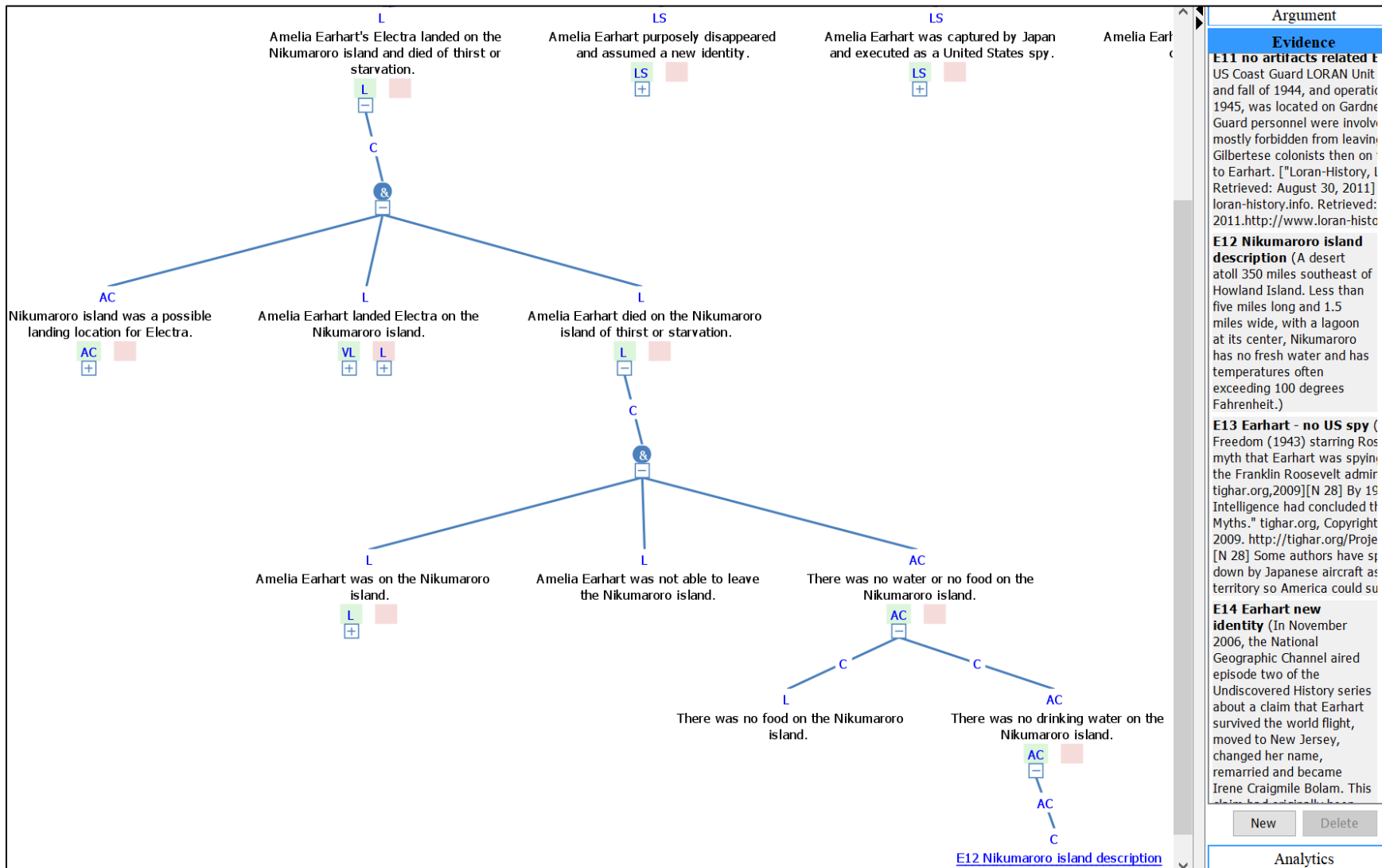


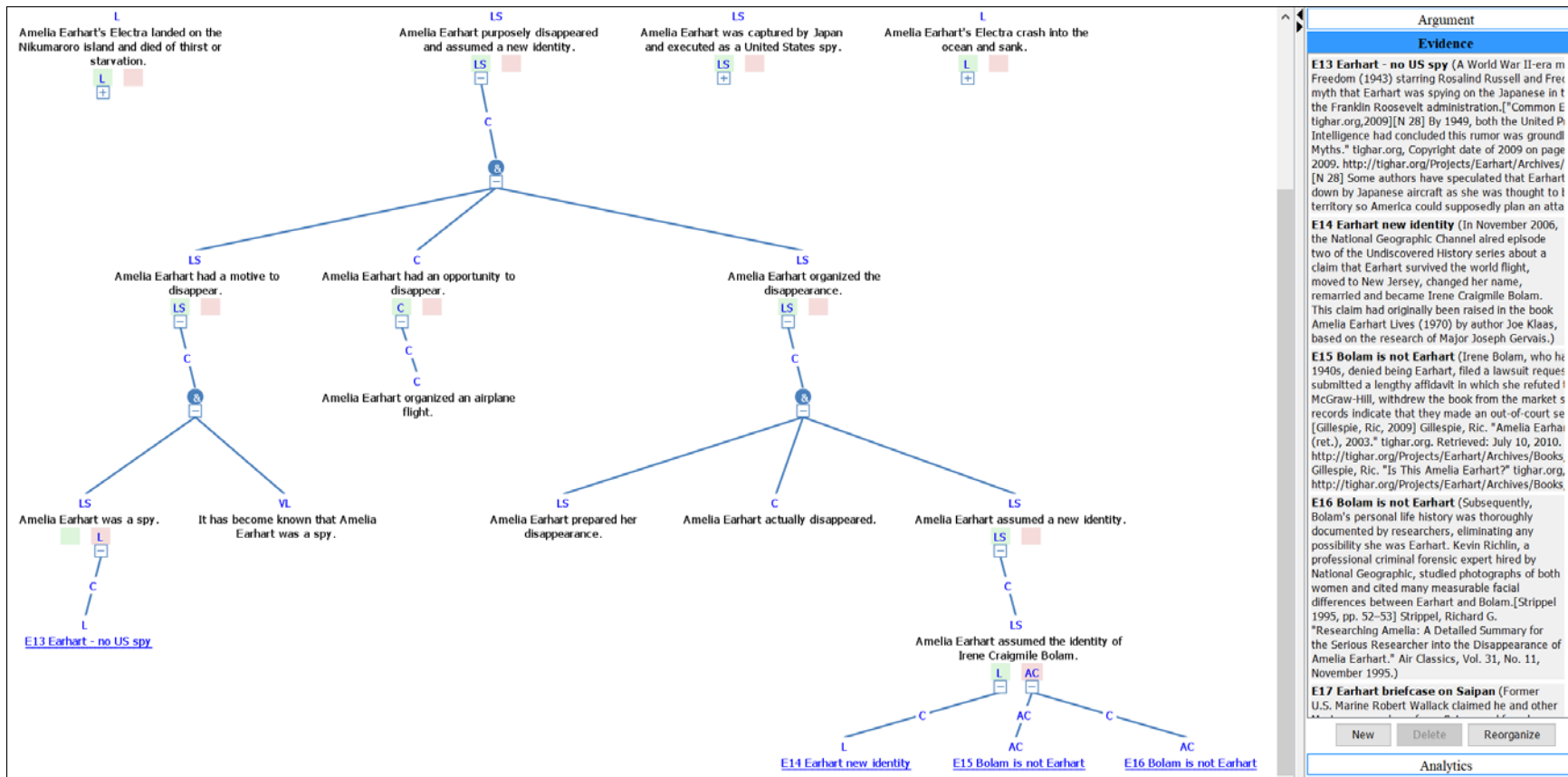
Topic: Amelia Earhart	Argument
<p data-bbox="961 532 1045 565">Inquiry: What happened to Amelia Earhart's plane?</p> <p data-bbox="583 654 793 703">Amelia Earhart's Electra landed on the Nikumaroro island and died of thirst or starvation.</p> <p data-bbox="835 654 1035 686">Amelia Earhart purposely disappeared and assumed a new identity.</p> <p data-bbox="741 703 762 719">C</p> <p data-bbox="216 898 373 930">Nikumaroro island was a possible landing location for Electra.</p> <p data-bbox="741 898 930 930">Amelia Earhart landed Electra on the Nikumaroro island.</p> <p data-bbox="972 898 1045 930">Amelia Earhart</p> <p data-bbox="195 1027 342 1044">E4 Signals from Nikumaroro</p> <p data-bbox="384 1027 583 1060">E5 Earhart and Electra artifacts found on Nikumaroro</p> <p data-bbox="615 1027 825 1060">E6 Earhart and Electra artifacts found on Nikumaroro</p> <p data-bbox="867 1027 1024 1060">E7 Electra parts in water near Nikumaroro</p>	<p data-bbox="1455 423 1518 440">Evidence</p> <p data-bbox="1056 464 1896 675">E4 Signals from Nikumaroro (Some of these reports of transmissions were later determined to be hoaxes but others were deemed authentic. Bearings taken by Pan American Airways stations suggested signals originating from several locations, including Gardner Island.[Gillespie 2006, p. 115][Strippel 1995, p. 18] It was noted at the time that if these signals were from Earhart and Noonan, they must have been on land with the aircraft since water would have otherwise shorted out the Electra's electrical system.[Gillespie 2006, diagram p. 190][N 22][Gillespie 2006, p. 140.][N 23] Sporadic signals were reported for four or five days after the disappearance but none yielded any understandable information.[Goldstein and Dillon 1997, p. 241][N 24] The captain of the USS Colorado later said "There was no doubt many stations were calling the Earhart plane on the plane's frequency, some by voice and others by signals. All of these added to the confusion and doubtfulness of the authenticity of the reports."[Gillespie 2006, p. 146] Gillespie, Ric. Finding Amelia: The True Story of the Earhart Disappearance. Annapolis, Maryland: Naval Institute Press, 2006. ISBN 1-59114-319-5. Strippel, Richard G. "Researching Amelia: A Detailed Summary for the Serious Researcher into the Disappearance of Amelia Earhart." Air Classics, Vol. 31, No. 11, November 1995. [N 22] The essential components were all mounted low, including the generator, batteries, dynamotor and transmitter. [N23] In order to operate the radio for any length of time, the aircraft would have had to be standing more or less upright on its landing gear with the right engine running in order to charge the 50-watt transmitter's battery, which would have consumed six gallons of fuel per hour. Goldstein, Donald M. and Katherine V. Dillon. Amelia: The Centennial Biography of an Aviation Pioneer. Washington, D.C.: Brassey's, 1997. ISBN 1-57488-134-5. [N 24] The first two days were marked by rumors and misinformation regarding radio transmission capabilities of the Lockheed Model 10 Electra that were finally resolved by the aircraft company. Gillespie, Ric. Finding Amelia: The True Story of the Earhart Disappearance. Annapolis, Maryland: Naval Institute Press, 2006. ISBN 1-59114-319-5.)</p> <p data-bbox="1056 683 1896 837">E5 Earhart and Electra artifacts found on Nikumaroro (Artifacts discovered by TIGHAR on Nikumaroro have included improvised tools; an aluminum panel, pos made using 1930s manufacturing specifications; an oddly cut piece of clear Plexiglas the same thickness and curvature of an Electra window; and a size 9 Cat's Paw h 1930s which resembles Earhart's footwear in world flight photos.[Pyle, Richard, 2007][N 27] The evidence remains circumstantial, but Earhart's surviving stepson, Ge expressed support for TIGHAR's research.[Cruikshank, Joe, 2006] This evidence was further bolstered by a recently rediscovered photo of Earhart's Electra, which she similar in shape and size to the one found by TIGHAR had been used to seal a broken rear window in the plane just prior to departure. No other known photos show it match the panel's rivet pattern to the photo are ongoing. [Foxnews.com, 2014] Pyle, Richard. "Diary a clue to Amelia Earhart mystery." AP via "Huffington Post," Mar June 29, 2013. http://www.huffingtonpost.com/huff-wires/20070331/search-for-amelia/ [N 27] According to records, Noonan was 6 ft (1.8 m) tall and Earhart was 5 ft 6 in (1.68 m) tall. Pyle, Richard. "The Search for Earhart's Plane Continues." Treasure County Palm News, November 4, 2006. Retrieved: A https://verify2.newsbank.com/ELinks/docreq/docreq.xml?docid=00000000000000000000&siteid=TCNP&paperid=TCNP&from=Redestination-http%3A%2F%2Fwww.newsbank.com/ "Report points to photo as possible new clue to Amelia Earhart's fate" FoxNews.com, July 1, 2014. Retrieved: July 1, 2014. http://www.foxnews.com/science/2014/07/01/photo-may-offer-crucial-clue-in-amelia-earhart-mystery-report/)</p> <p data-bbox="1056 846 1896 976">E6 Earhart and Electra artifacts found on Nikumaroro (In 2007, a TIGHAR expedition visited Nikumaroro searching for unambiguously identifiable aircraft artifacts and DNA. The group included engineers, technical experts, archaeologists, anthropologists, and researchers.[Pyle, Richard, 2007] They found artifacts of uncertain origin on the weather-ravaged atoll, including bronze bearings which may have belonged to Earhart's aircraft and a zipper pull which might have come from her flight suit.["TIGHAR 2007 Expedition Updates" tighar.org, 2007] In 2010, the research group said it had found bones that appeared to be part of a human finger. Subsequent DNA testing at the University of Oklahoma proved inconclusive as to whether the bone fragments were from a human or from a sea turtle.[Gast, Phil, 2011] Pyle, Richard. "New search begins in Earhart mystery." USA Today, July 12, 2007. Retrieved: June 29, 2013. http://usatoday30.usatoday.com/news/nation/2007-07-12-2214476002_x.htm "TIGHAR 2007 Expedition Updates" tighar.org, August, 2007. Retrieved: June 29, 2013. Gast, Phil."DNA tests on bone fragment inconclusive in Amelia Earhart search" www.cnn.com, March 3, 2011, Retrieved: March 3, 2011. http://www.cnn.com/2011/US/03/03/earhart.dna.research/7hpt=11)</p> <p data-bbox="1056 984 1896 1122">E7 Electra parts in water near Nikumaroro (July 2012, TIGHAR conducted an underwater expedition off the northwest reef of Nikumaroro, using sonar mapping. Some of the sonar images suggested a possible wreckage site,[Daily Mail, 2012] although Ric Gillespie, executive director of TIGHAR, cautioned that most of the Electra's parts would likely have disintegrated after 75 years in sea water.[Lorenz, Rossella, 2012] Nevertheless, in May 2013, TIGHAR announced that professional analysis of a 32-foot (9.8 m) anomaly in the sonar images showed what could possibly be the aircraft.[Zap, Claudine, 2013][Sample, Jan, 2013] "Amelia Earhart Underwater video reveals evidence solves 75 year mystery aviators flight." Daily Mail, August 18, 2012. Retrieved: March 10, 2013. http://www.dailymail.co.uk/news/article-2190099/Amelia-Earhart-Underwater-video-reveals-evidence-solves-75-year-mystery-aviators-flight.html Lorenz, Rossella. "Pieces of Amelia Earhart's plane located?" Discovery Communications, LLC, November 18, 2012. Retrieved: March 10, 2013. http://news.discovery.com/history/us-history/amelia-earhart-plane-located-120817.htm Zap, Claudine. "Sonar image may show Amelia Earhart's plane." News.yahoo.com, 2013. Retrieved: May 30, 2013. http://news.yahoo.com/blogs/lookout/sonar-image-may-show-amelia-earhart-plane-153437423.html Sample, Jan. "Pacific sonar 'streak' may be wreck of Amelia Earhart's plane." guardian.co.uk, 2013, Retrieved: May 31, 2013. http://www.theguardian.com/world/2013/may/31/pacific-wreck-amelia-earharts-plane?INTCMP=SRCH)</p>

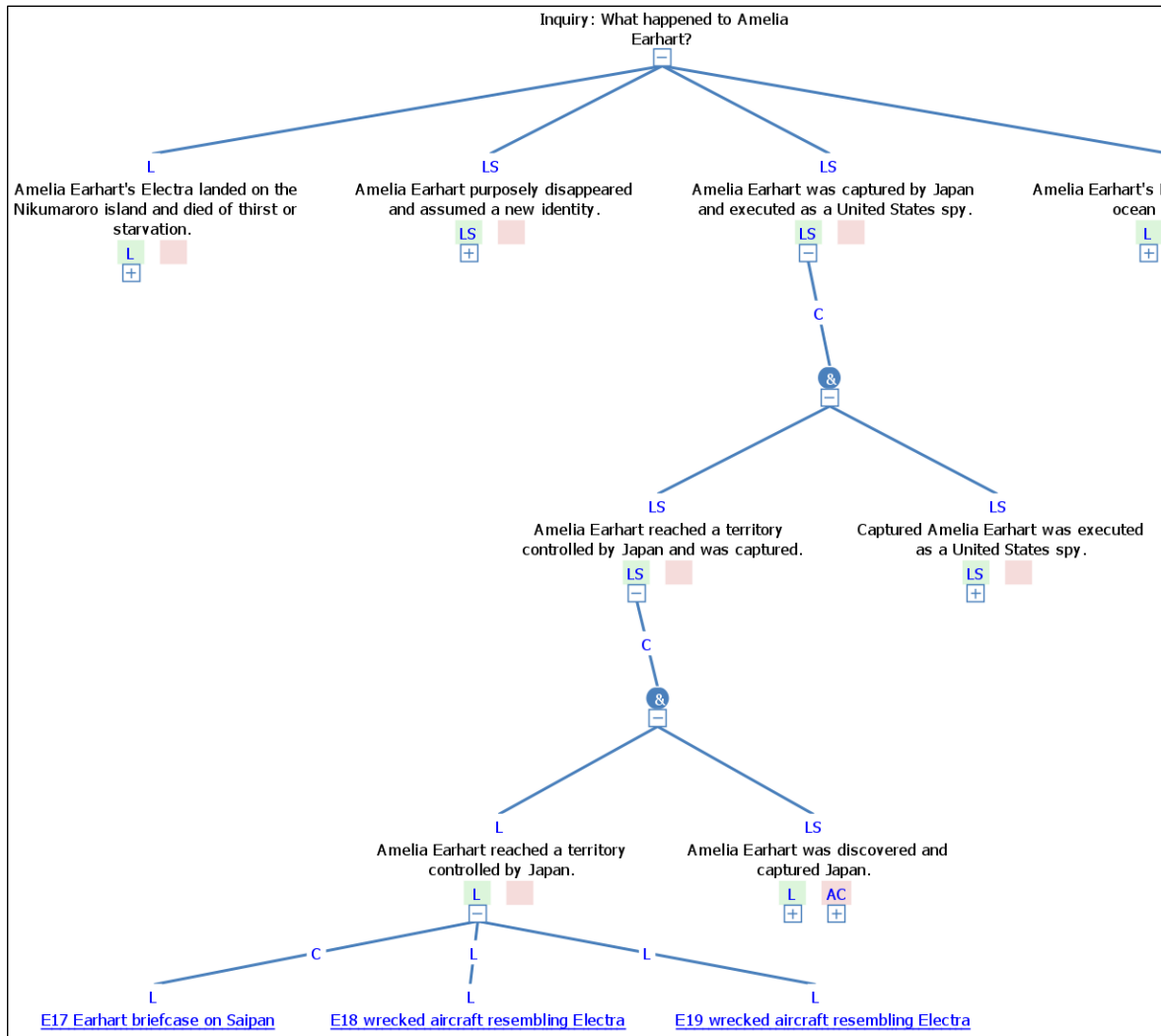


Argument
Evidence
<p>yahoo.com, 2013. Retrieved: May 30, 2013. http://news.yahoo.com/blogs/lookout/sonar-image-may-show-amelia-earhart-plane-153437423.html Sample, Ian. "Pacific sonar 'streak' may be wreck of Amelia Earhart's plane." guardian.co.uk, 2013. Retrieved: May 31, 2013. http://www.theguardian.com/world/2013/may/31/pacific-wreck-amelia-earharts-plane?INTCMP=SRCH)</p> <p>E8 Unsuccessful search of Nikumaroro (A week after the disappearance, naval aircraft from the Colorado flew over several islands in the group including Gardner Island (now called Nikumaroro), which had been uninhabited for over 40 years. The subsequent report on Gardner read: "Here signs of recent habitation were clearly visible but repeated circling and zooming failed to elicit any answering wave from possible inhabitants and it was finally taken for granted that none were there..." [N 25] [N 25] Memo from Senior Aviator, USS Colorado, to The Chief of the Bureau of Aeronautics, "Aircraft Search of Earhart Plane." Their commander Capt Friedell made no note of "recent habitation" in his official summary.[Finding Amelia DVD, Annapolis, Maryland: Naval Institute Press, 2006. DVD: Contents: Reports: Lambrecht.pdf, p. 3])</p> <p>E9 Transmissions attributed to Nikumaroro Island were false (David Jourdan, a former Navy submariner and ocean engineer specializing in deep-sea recoveries, has claimed any transmissions attributed to Gardner Island were false. Through his company Nauticos he extensively searched a 1,200-square-mile (3,100 km²) quadrant north and west of Howland Island during two deep-sea sonar expeditions (2002 and 2006, total cost \$4.5 million) and found nothing. The search locations were derived from the line of position (157-337) broadcast by Earhart on July 2, 1937. [109])</p>





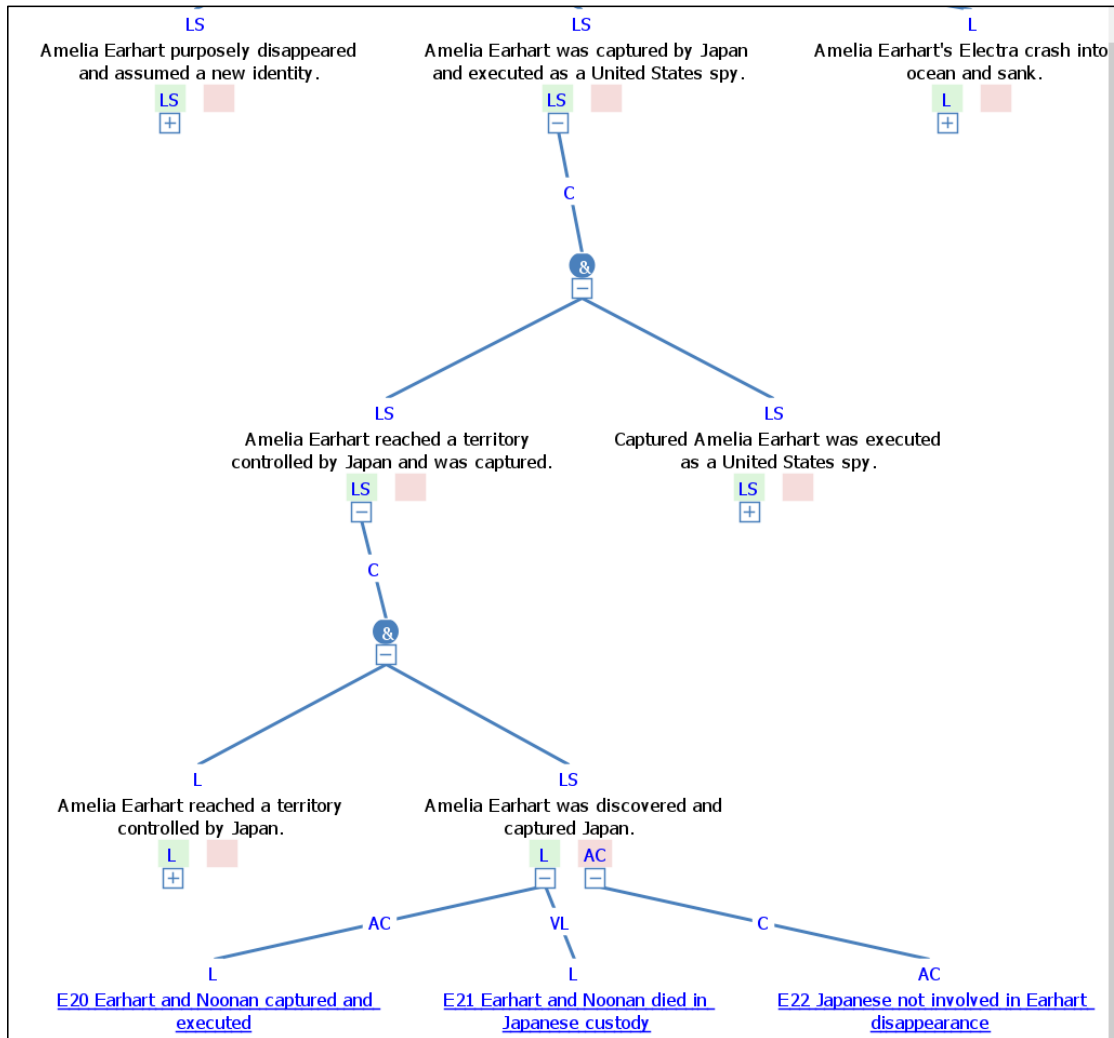




Evidence
<p>E17 Earhart briefcase on Saipan (Former U.S. Marine Robert Wallack claimed he and other Marines opened a safe on Saipan and found Earhart's briefcase.)</p>
<p>E18 wrecked aircraft resembling Electra (In 1990, Donald Angwin, a veteran of the Australian Army's World War II campaign in New Britain, contacted researchers to suggest that a wrecked aircraft he had witnessed in jungle about 40 miles (64 km) southwest of Rabaul, on April 17, 1945, may have been Earhart's Electra.[Billings, David, 2000] Angwin, who was a corporal in the 11th Battalion at the time,[Angwin, Donald Arthu, 2002] reported that he and other members of a forward patrol on Japanese-occupied New Britain had found a wrecked twin-engine, unpainted all-metal aircraft. The soldiers recorded a rough position on a map, along with serial numbers seen on the wreckage. While the map was located in the possession of another veteran in 1993, subsequent searches of the area indicated failed to find a wreck.[Billings, David, 2000] Billings, David. "Aircraft Search Project in Papua New Guinea." Wings Over Kansas, 2000. Retrieved: March 27, 2012. http://www.wingsoverkansas.com/earhart/a850/ "Angwin, Donald Arthur." Commonwealth of Australia: Military Forces, 2002. Retrieved: March 27, 2012.)</p>
<p>E19 wrecked aircraft resembling Electra (While Angwin died in 2001, David Billings, an Australian aircraft engineer, has continued to investigate his theory. Billings claims that the serial numbers written on the map, "600H/P 53HI C/N1055", represent: • a 600 hp (450 kW) Pratt & Whitney R-1340-53H1 model engine and; • "Constructor's Number 1055", an airframe identifier. These would be consistent with a Lockheed Electra 10E, such as that flown by Earhart, although they do not contain enough information to identify the wreck in question as NR16020. [Billings, David, 2000] Billings, David. "Aircraft Search Project in Papua New Guinea." Wings Over Kansas, 2000. Retrieved: March 27, 2012. http://www.wingsoverkansas.com/earhart/a850/)</p>
<p>E20 Earhart and Noonan captured and executed (In 1966, CBS's Goerner published a book claiming Earhart and Noonan were captured their aircraft crashed on the island of Saipan, part of the Mariana Islands it was under Japanese occupation.[Goerner 1966, p. 304][N 30] "Obituary: Fred Goerner, Broadcaster Times, September 16, 1994["Sinister Conspiracy?" Time Magazine, Se 29][Goerner 1966, p. 304][N 30] "Obituary: Fred Goerner, Broadcaster Times, September 16, 1994. http://www.nytimes.com/1994/09/16/obituaries/fred-goerner-broadcaster-conspiracy/" Time Magazine, September 16, 1966. Retrieved: July 2, 2002 http://content.time.com/time/magazine/article/0,9171,836416-2,00.html book was immediately challenged, but the Time Magazine article on it from Admiral Chester W. Nimitz, who allegedly told Goerner in March 1945 that Earhart and her navigator did go down in the Marshalls and were p</p>

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Analytics



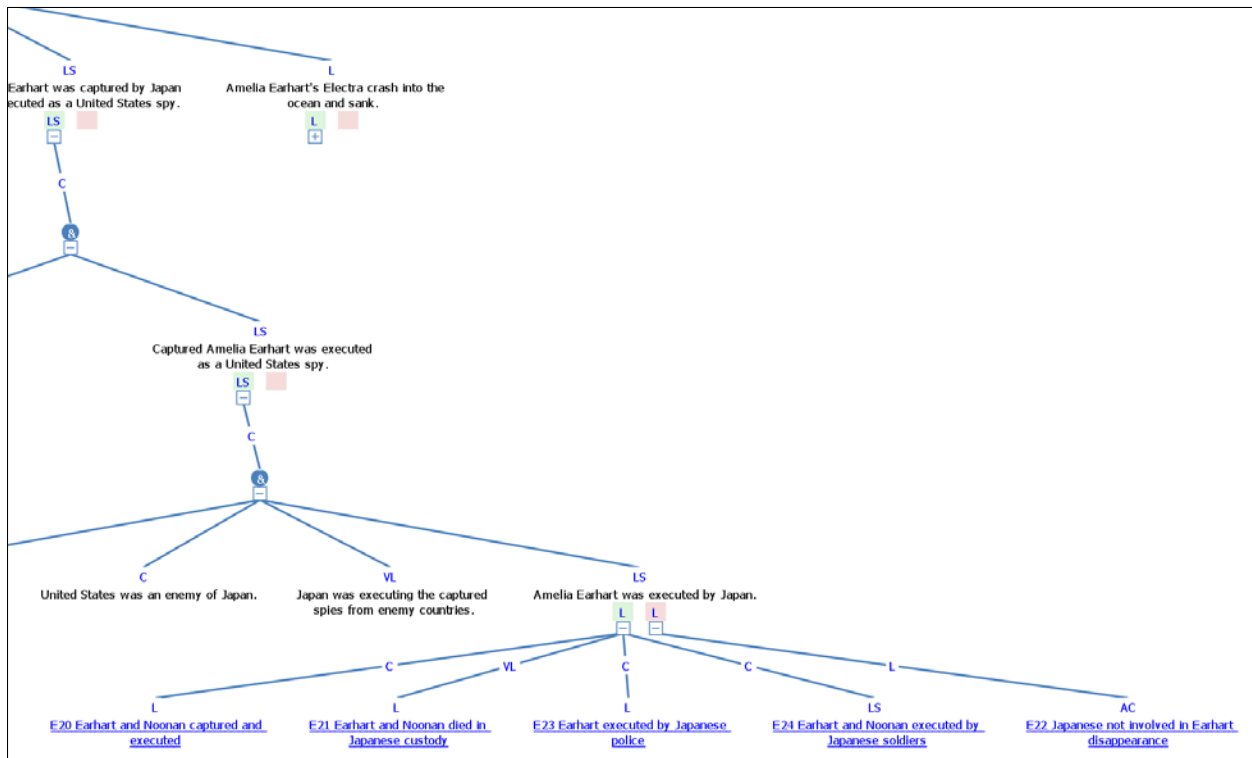
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E21 Earhart and Noonan died in Japanese custody (In 2009, an Earhart relative stated that the pair died in Japanese custody, citing unnamed witnesses including Japanese troops and Saipan natives. [Henley, David C., 2009] He said that the Japanese cut the valuable Lockheed aircraft into scrap and threw the pieces into the ocean. [Henley, David C., 2009] Henley, David C. "Cousin: Japanese captured Amelia Earhart." [dead link] Nevada Appeal, October 31, 2009. Retrieved: November 7, 2009.)

E22 Japanese not involved in Earhart disappearance (Jackie Cochran, another pioneering aviator and one of Earhart's friends, made a postwar search of numerous files in Japan and was convinced the Japanese were not involved in Earhart's disappearance. [Cochran 1954, p. 160] Cochran, Jacqueline. Stars at Noon. Boston: Little, Brown and Company, 1954.)



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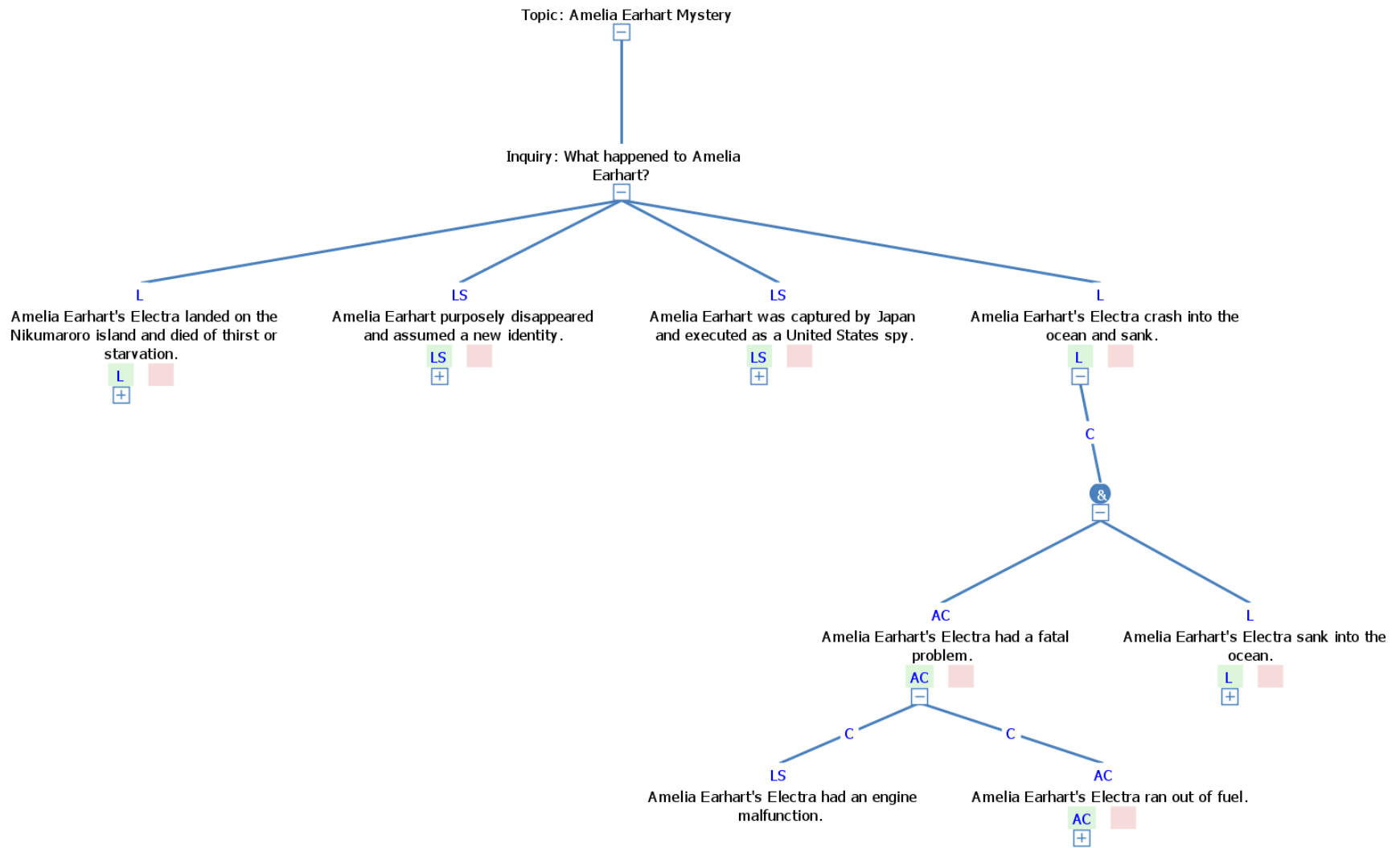
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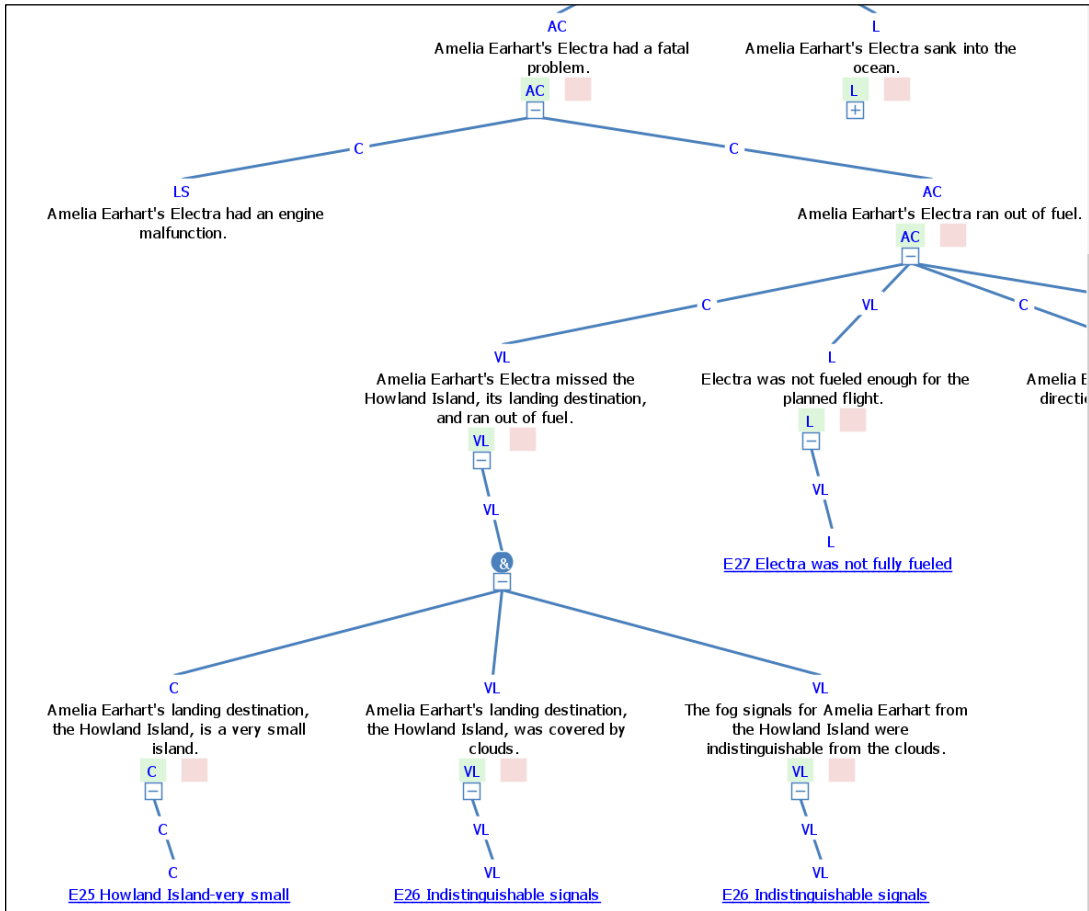
E23 Earhart executed by Japanese police (Thomas E. Devine (who served in a postal Army unit) wrote Eyewitness: The Amelia Earhart Incident which includes a letter from the daughter of a Japanese police official who claimed her father was responsible for Earhart's execution. [citation needed])

E24 Earhart and Noonan executed by Japanese soldiers (In 1990, the NBC-TV series Unsolved Mysteries broadcast an interview with a Saipanese woman who claimed to have witnessed Earhart and Noonan's execution by Japanese soldiers. No independent confirmation or support has ever emerged for any of these claims. [Strippel 1995, p. 52] Purported photographs of Earhart during her captivity have been identified as either fraudulent or having been taken before her final flight. ["Amelia Earhart FAQ." tighar.org. Retrieved: July 10, 2010.] Strippel, Richard G. "Researching Amelia: A Detailed Summary for the Serious Researcher into the Disappearance of Amelia Earhart." Air Classics, Vol. 31, No. 11, November 1995. "Amelia Earhart FAQ." tighar.org. Retrieved: July 10, 2010. <http://tighar.org/Projects/Earhart/Archives/Forum/FAQs/captured.htm>)

E25 Howland Island-very small (Their intended destination was Howland Island, a flat sliver of land 6,500 ft (2,000 m) long and 1,600 ft (500 m) wide.

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E25 Howland Island-very small (Their intended destination was Howland Island, a flat sliver of land 6,500 ft (2,000 m) long and 1,600 ft (500 m) wide, 10 ft (3 m) high and 2,556 miles (4,113 km) away.)

E26 Indistinguishable signals (The Itasca used her oil-fired boilers to generate smoke for a period of time but the fliers apparently did not see it. The many scattered clouds in the area around Howland Island have also been cited as a problem: their dark shadows on the ocean surface may have been almost indistinguishable from the island's subdued and very flat profile.)

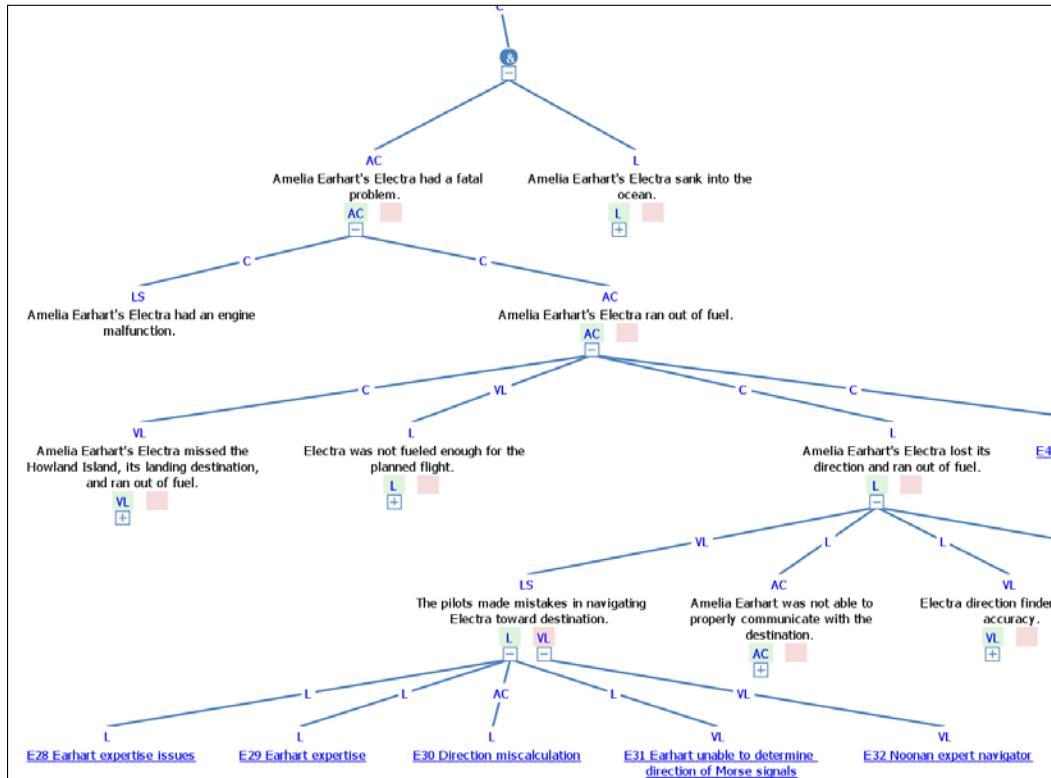
E27 Electra was not fully fueled (British aviation historian Roy Nesbit interpreted evidence in contemporary accounts and Putnam's correspondence and concluded Earhart's Electra was not fully fueled at Lae.[Strippel 1995, p. 58] Strippel, Richard G. "Researching Amelia: A Detailed Summary for the Serious Researcher into the Disappearance of Amelia Earhart." Air Classics, Vol. 31, No. 11, November 1995.)

E28 Earhart expertise issues (uring the takeoff run, Earhart ground-looped, circumstances of which remain controversial. Some witnesses at Luke Field including the Associated Press journalist on the scene said they saw a tire blow.[Rich 1989, p. 245.] Earhart thought either the Electra's right tire had blown and/or the right landing gear had collapsed. Some sources, including Mantz, cited pilot error.[Rich 1989, p. 245.] Rich, Doris L. Amelia Earhart: A Biography. Washington, D.C.: Smithsonian Institution Press, 1989. ISBN 1-56098-725-1.)

E29 Earhart expertise (Some sources have noted Earhart's apparent lack of understanding of her direction-finding system, which had recently fitted to the aircraft just prior to the flight. The system was equipped with a new receiver from Bendix that operated on five wavelength "bands", marked 1 to 5. The loop antenna was equipped with a tuneable loading coil that changed the effective length of the antenna to allow it to work efficiently at different wavelengths. The tuner on the antenna was also marked with five settings, 1 to 5, but, critically, these were not the same frequency bands as the corresponding bands on the radio. The two were close enough for settings 1, 2 and 3, but the higher frequency settings, 4 and 5, were entirely different. Earhart's only training on the system was a brief introduction by Joe Gurr at the Lockheed factory, and the topic had not come up. A card displaying the band settings of the antenna was mounted so it was not visible. Gurr explained that higher frequency bands would offer better accuracy and longer range.[Elgen and Marie Long, "Amelia Earhart: The Mystery Solved", p. 116] Long, Elgen M. and Marie K. Amelia Earhart: The Mystery Solved. New York: Simon & Schuster, 1999. ISBN 0-684-86005-8.)

E30 Direction miscalculation (William L. Polhemous, the navigator on Ann Pellegrino's 1967 flight which followed Earhart and Noonan's original flight path, studied navigational tables for July 2, 1937 and thought Noonan may have miscalculated the "single line approach" intended to "hit" Howland.[Strippel 1995, pp. 58-60] Strippel, Richard G. "Researching Amelia: A Detailed Summary for the Serious

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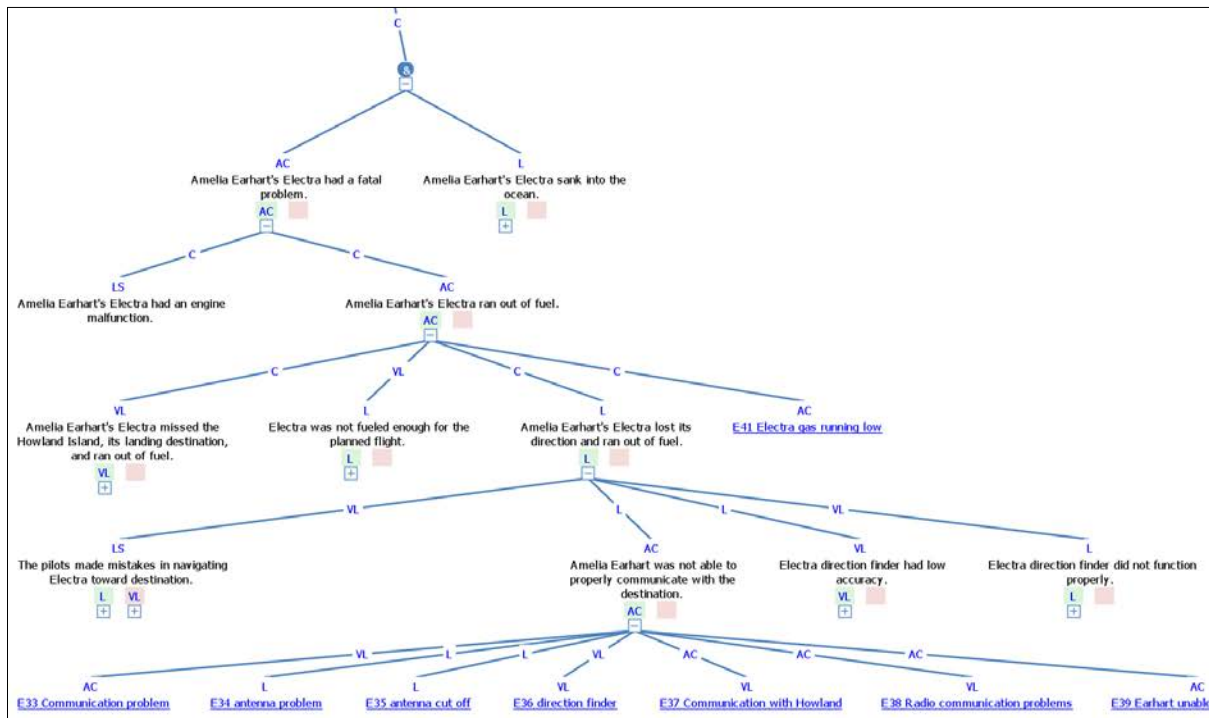
E30 Direction miscalculation (William L. Polhemous, the navigator on Ann Pellegrino's 1967 flight which followed Earhart and Noonan's original flight path, studied navigational tables for July 2, 1937 and thought Noonan may have miscalculated the "single line approach" intended to "hit" Howland.[Strippel 1995, pp. 58, 60] Strippel, Richard G. "Researching Amelia: A Detailed Summary for the Serious Researcher into the Disappearance of Amelia Earhart." Air Classics, Vol. 31, No. 11, November 1995.)

E31 Earhart unable to determine direction of Morse signals (Her 7:58 am transmission said she couldn't hear the Itasca and asked them to send voice signals so she could try to take a radio bearing. ... They couldn't send voice at the frequency she asked for, so Morse code signals were sent instead. Earhart acknowledged receiving these but said she was unable to determine their direction.[Jacobson, Randall S., 2009] Jacobson, Randall S., PhD. "The Final Flight. Part 3: At Howland Island." tighar.org, 2009. Retrieved: July 10, 2010. http://tighar.org/Projects/Earhart/Archives/Research/ResearchPapers/Worldflight/finallflight3.html)

E32 Noonan expert navigator (Through contacts in the Los Angeles aviation community, Fred Noonan was subsequently chosen as a second navigator because there were significant additional factors which had to be dealt with while using celestial navigation for aircraft.[Long 1999, p. 65.][Post and Gatty 1931, pp. 45-56.] He had vast experience in both marine (he was a licensed ship's captain) and flight navigation. Noonan had recently left Pan Am, where he established most of the company's China Clipper seaplane routes across the Pacific. Noonan had also been responsible for training Pan American's navigators for the route between San Francisco and Manila.[Grooch 1936, pp. 177, 189.][Noonan also navigated the China Clipper on its first flight to Manila, departing Alameda under the command of Captain Ed Musick, on November 22, 1935.] The original plans were for Noonan to navigate from Hawaii to Howland Island, a particularly difficult portion of the flight; then Manning would continue with Earhart to Australia and she would proceed on her own for the remainder of the project. Long, Elgen M. and Marie K. Amelia Earhart: The Mystery Solved. New York: Simon & Schuster, 1999. ISBN 0-684-86005-8. Post, Wiley and Harold Gatty. "Chapter III, "Driving from the back seat." Around the World in Eight Days. New York: Rand McNally & Company, 1931. Grooch, William Stephen. Skyway to Asia. New York: Longmans, Green and Co., 1936. No ISBN.)

E33 Communication problem (Another cited cause of possible confusion was that the Itasca and Earhart planned their communication schedule using time systems set a half hour apart, with Earhart using Greenwich Civil Time (GCT) and the Itasca under a Naval time zone designation system[Hooversten 2007, pp. 22-23.]

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E34 antenna problem (Motion picture evidence from *Lae* suggests that an antenna mounted underneath the fuselage may have been torn off from the fuel-heavy Electra during taxi or takeoff from *Lae*'s turf runway, though no antenna was reported found at *Lae*.)

E35 antenna cut off (Don Dwiggins, in his biography of Paul Mantz (who assisted Earhart and Noonan in their flight planning), noted that the aviators had cut off their long-wire antenna, due to the annoyance of having to crank it back into the aircraft after each use.)

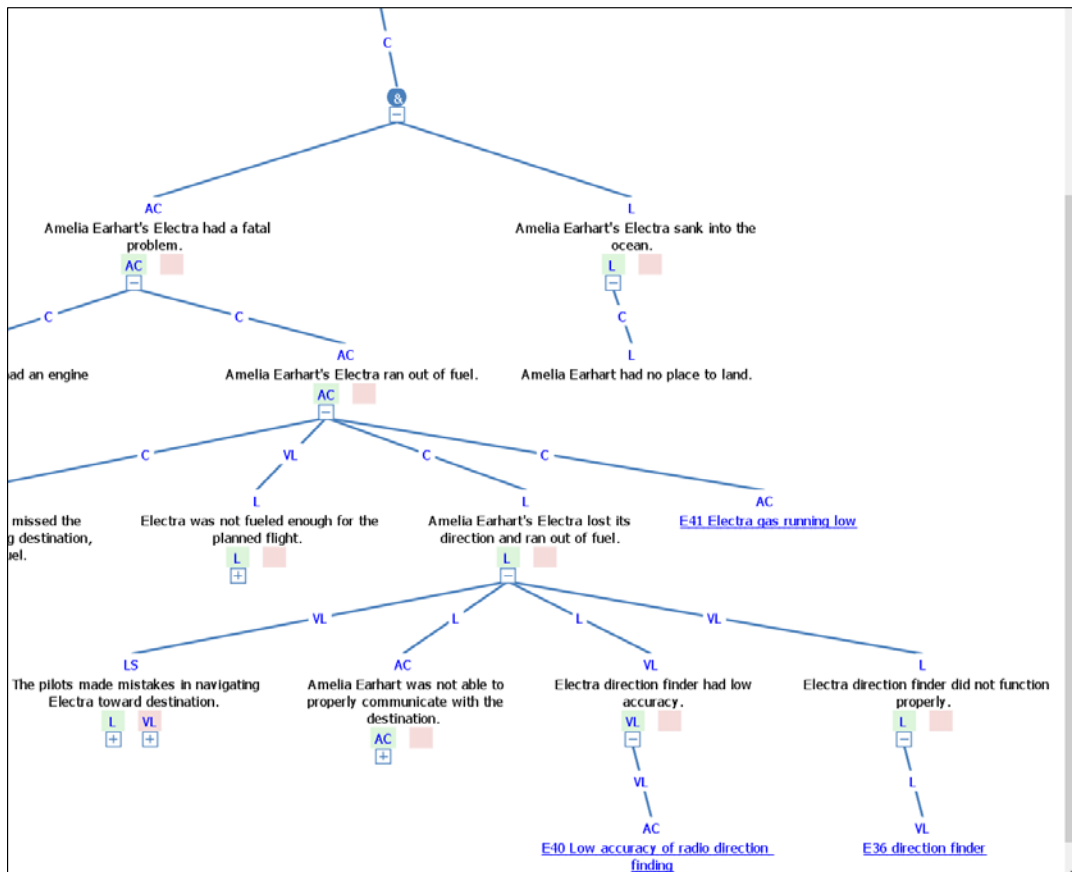
E36 direction finder (During Earhart and Noonan's approach to Howland Island the *Itasca* received strong and clear voice transmissions from Earhart identifying as KHAQQ but she apparently was unable to hear voice transmissions from the ship. Signals from the ship would also be used for direction finding, implying that the aircraft's direction finder was also not functional.)

E37 Communication with Howland (At 6:14 am another call was received stating the aircraft was within 200 miles (320 km), and requested that the ship use its direction finder to provide a bearing for the aircraft. Earhart began whistling into the microphone to provide a continual signal for them to home in on [Candace Fleming, 2011, p. 3.] It was at this point that the radio operators on the *Itasca* realized that their RDF system could not tune in the aircraft's 3015 kHz frequency; radioman Leo Bellarts later commented that he "was sitting there sweating blood because I couldn't do a darn thing about it." A similar call asking for a bearing was received at 6:45 am, when Earhart estimated they were 100 miles (160 km) out. [Candace Fleming, 2011, p. 4.] Candace Fleming, "Amelia Lost: The Life and Disappearance of Amelia Earhart", Random House, 2011.)

E38 Radio communication problems (Whether any post-loss radio signals were received Earhart and Noonan remains unclear. If transmissions were received from the Electra, most I were weak and hopelessly garbled. Earhart's voice transmissions to Howland were on 3105 kHz frequency restricted to aviation use in the United States by the FCC. [American Radio Relay L. 1945, p. 453.] This frequency was not thought to be fit for broadcasts over great distances. Earhart was at cruising altitude and midway between *Lae* and Howland (over 1,000 miles (1,600 km) from each) neither station heard her scheduled transmission at 0815 GCT. [Long 1999, p. 20. Moreover, the 50-watt transmitter used by Earhart was attached to a less-than-optimum-lean antenna. [Everette, Michael, 2009] [American Radio Relay League 1945, pp. 196-199.] [N 19] Radio Relay League 1945, p. 453. Quote: "Frequencies between 2,504 to 3,497.5 kc were all "Coastal harbor, government, aviation, fixed, miscellaneous." Long, Elgen M. and Marie K. An Earhart: The Mystery Solved. New York: Simon & Schuster, 1999. ISBN 0-684-86005-8. Evere Michael. "Electric Radio Communications Equipment Installed on Board Lockheed Electra NR11 tighar.org, 2009. Retrieved: July 10, 2010. http://tighar.org/Projects/Earhart/Archives/Research/ResearchPapers/ElectraRadios/ElectraRadios.htm height of the antenna is important, a horizontally polarized antenna operating at a small fraction of wavelength above the ground will be less efficient than that same antenna operating at cruise altitude.)

E39 Earhart unable to hear Itasca (Her 7:58 am transmission said she couldn't hear the *Itasca* and asked them to send voice signals so she could try to take a radio bearing. ... [Jacobson, Randall S., 2009] Jacobson, Randall S., PhD. "The Final Flight, Part 3: At Howland Island." tighar.org, 2009. Retrieved: July 10, 2010. http://tighar.oral/Projects/Earhart/Archives/Research/ResearchPapers/Worldflight/finalflight3.html)

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E39 Earhart unable to hear Itasca (Her 7:58 am transmission said she couldn't hear the Itasca and asked them to send voice signals so she could try to take a radio bearing. ... [Jacobson, Randall S., 2009] Jacobson, Randall S., PhD. "The Final Flight. Part 3: At Howland Island." tighar.org, 2009. Retrieved: July 10, 2010. <http://tighar.org/Projects/Earhart/Archives/Research/ResearchPapers/Worldflight/finalflight3.html>)

E40 Low accuracy of radio direction finding (Fred Noonan had earlier written about problems affecting the accuracy of radio direction finding in navigation.[Noonan, 1935] Noonan, Fred. Memo to Operations Manager, Pacific Division, Pan American Airlines, April 29, 1935: "The inaccuracies of direction finding bearings can be very definitely cataloged: twilight effects, faint signals, wide splits of minima and inaccurate calibration.")

E41 Electra gas running low (At 7:42 am Earhart radioed "We must be on you, but cannot see you—but gas is running low. ... [Jacobson, Randall S., 2009] Jacobson, Randall S., PhD. "The Final Flight. Part 3: At Howland Island." tighar.org, 2009. Retrieved: July 10, 2010. <http://tighar.org/Projects/Earhart/Archives/Research/ResearchPapers/Worldflight/finalflight3.html>)

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