

# Ada, OS/2 and Aircraft Design

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# Origin of Ada

- In the early 1970s the U.S. DoD concluded that it was spending too much money on maintaining software in too many different programming languages.
- High-order language working group (HOL WG) formed 1975 to establish requirements for common language.



# Requirements

- Requirements refined in open review process: Strawman (April 1975), Woodenman (Aug 1975), Tinman (Jan 1976), Ironman (Jan 1977), Steelman (Jun 1978).
- No existing programming language could completely meet the requirements, but some came close enough to be suitable as a starting point (Algol 68, Pascal, PL/I).



# Design competition

- In 1977 the U.S. DoD held a design competition on the basis of Ironman.
- Fifteen proposals received. The four best received a contract to further define their language.
- To preserve impartiality, the four submissions were only identified by a colour (green, blue, red, yellow)



# And the winner is... green

- After worldwide review, the green proposal was selected in May 1979 (Cii-Honeywell Bull, lead by Jean Ichbiah).
- Named Ada in honour of Lady Augusta Ada Byron (1815-1842), considered to be the world's first 'programmer' (difference engine by Charles Babbage)



# Ada 80, 83

- Mil Std 1815 (Dec 1980)
- Mil Std 1815A (Jan 1983), ANSI standard (Feb 1983), ISO standard 8652 (1987)
- Compilers were expensive.



# Ada 95

- Ada 9X project started July 1988.
- Prime contractor Intermetrics, lead by S. Tucker Taft.
- Revised ANSI and ISO standards Feb 1995.
- U.S. DoD awarded contracts for development of free compiler.



# Ada overview

- Good overview of history and characteristics of Ada:  
Ada 95 in Context, by Michael Feldman  
(<http://www.seas.gw.edu/~csci190/spring03/handbook.pdf>)



# Did Ada succeed?

- As a unified programming language?  
No way: DoD initially mandated use of Ada for new projects, but waivers were widely granted and the mandate was withdrawn in the 1990s
- Technically?  
Certainly: It has found its niche in high-integrity applications (avionics, air traffic control, safety systems, Swiss bank)



# gnat

- Team at NYU (Prof. Robert Dewar) obtained compiler contract for several platforms, using gcc as basis.
- On PC, OS/2 only powerful OS available (32 bit)
- Funded by DoD until 1994



# AdaCore

- In August 1994, the gnat team founded AdaCore Technologies to further develop and market the gnat Ada technology on a commercial basis
- Now well established Ada vendor supplying compilers to Boeing, Airbus, BAe, Lockheed-Martin etc.
- Compiler still open source (gcc)



# gnat on OS/2

- Following the rise of Windows NT based OSs, AdaCore switched from OS/2 to Windows NT as the PC environment around 2001.
- Latest gnat binaries for OS/2 (v. 3.14p, 3.15p) contributed in 2002 by Dave Parsons
- Although not the latest and greatest, still perfectly usable as an Ada compilation system.



# Where to obtain gnat for OS/2

- <ftp://ftp.cs.kuleuven.be/pub/Ada-Belgium/mirrors/gnu-ada/OLD/3.14p>
- <ftp://ftp.cs.kuleuven.be/pub/Ada-Belgium/mirrors/gnu-ada/3.15p>
- Do not use the versions on Hobbes; these are too old (3.09 and 3.12)



# Ada at Fokker

- Aircraft and engine performance programs for advanced design, running on mainframes (Algol on DEC10, Pascal and Ada 83 on VAX).
- Ended by bankruptcy in March 1996



# Switch to Ada 95 on OS/2

- PCs powerful enough to replace mainframes arrived just in time.
- Installed OS/2 Warp (100 guilders), bought 12 MB extra memory (1200 guilders), and started using gnat (free) on a 50 MHz PC.
- Early gnat versions gave lots of problems. Very good (free) support from AdaCore.
- gnat 3.14p pretty good