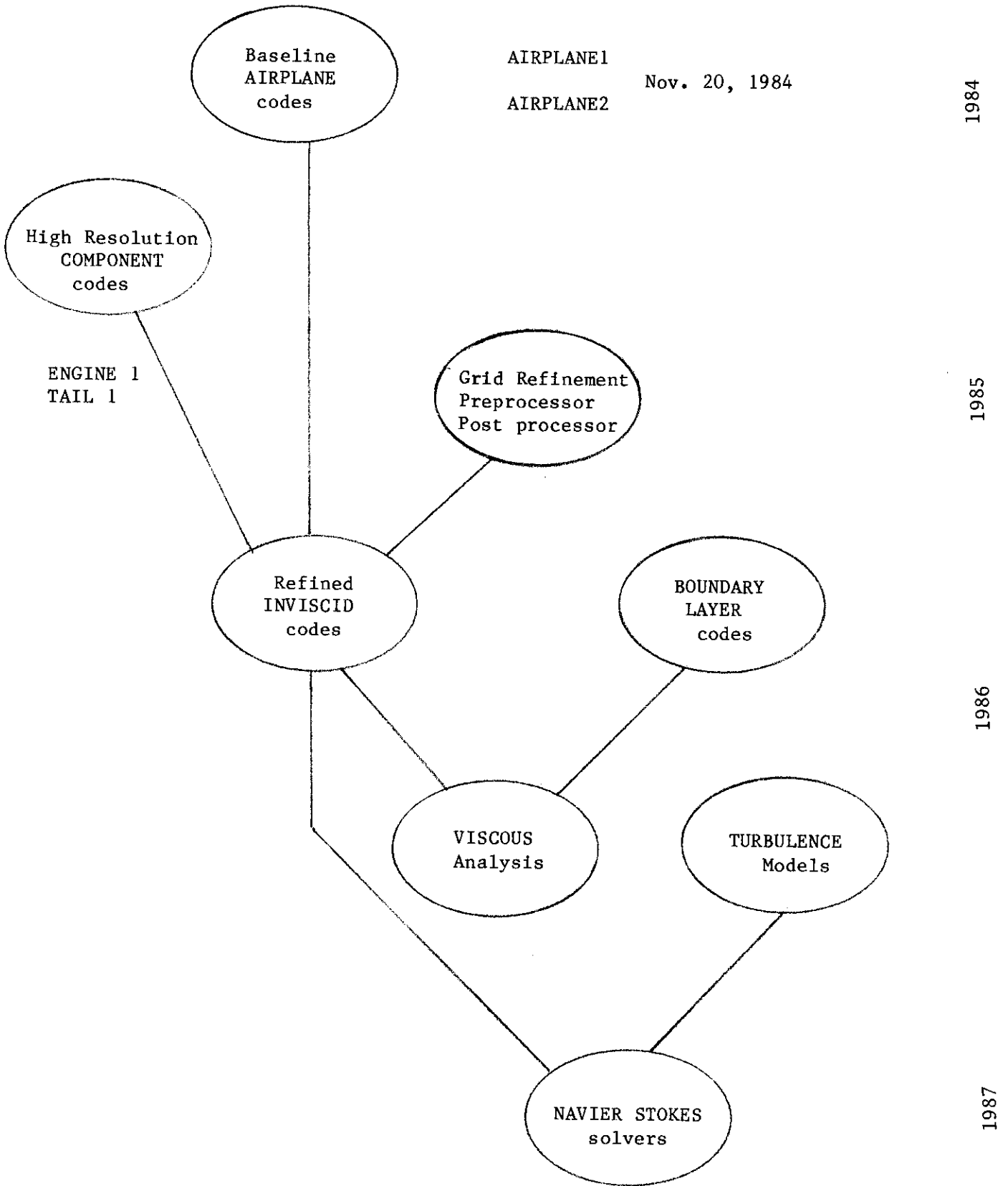


PLAN FOR AIRPLANE CODES

Antony Jameson July 15, 1984



PLAN FOR AIRPLANE CODES
(Antony Jameson: July 15, 1984)

Phase 1 - Baseline Codes for Euler Equations

A. Complete Airplane Codes

(Target completion date of at least one code:
November 20, 1984 - 50th birthday of A.J.)

AIRPLANE 1 Underwing engines

AIRPLANE 2 Fuselage mounted engines

H mesh with rectangular cutouts for nacelles. Multiblock data structures allowing addition of local embedded surface and refined meshes. 250-500 thousand mesh points with in core option using pointers and out of core option using I/O to disk or SSD.

B. Higher Resolution Component Codes

1) Wing nacelle pylon analysis

2) Rear Fuselage tail analysis

To be developed in parallel with complete airplane codes for complementary use to provide higher component accuracy at lower cost.

Phase 2 - Refinement and Validation

(September 84 - September 85)

A. Code Refinements (inviscid)

1. Local Refined Meshes
 - a. Tail
 - b. Wing Tip
 - c. Pylons
2. Local Special Mesh Cells for Non-Conforming Mesh
 - a. Fuselage Nose and Tail
 - b. Pylons
3. Pre-Processing Package (Flow Research)
 - a. Section by Section Input Option
 - b. Panel Input Option
 - c. Refined Grid Generating Methods
4. Post Processing Package (Flow Research/Cray?)
 - a. Grid Display
 - b. Section Pressure Distributions
 - c. Surface Contour Plots
 - d. Streamlines
 - e. Force Integration Separating Drag Components

B. Validation

1. Obtain Representative Data Base
2. Work Closely with One or Two Selected Potential Customers to Demonstrate Code Capabilities.

Phase 3 - Viscous Effects

(Should overlap Phase 2: September 84 -)

A. Boundary Layer Corrections

1. Wing b.l. Correction
(Use an existing 3D integral b.l. code)
2. B.l Corrections of other Components
(May need new codes, and corner analysis)

B. Reynold's Averaged Navier Stokes Option

1. Add NS Option Baseline Codes, along with Refined Meshes
Near Surfaces
2. Development and Comparison of Alternative Turbulence Models