Trip Reports: ISO Working Group 9, Ada, Uniformity of Ada Applications Rapporteur Group, and Ada Europe

Sue LeGrand

Planning Research Corporation

6/28 and 9/24, 1990

Cooperative Agreement NCC 9-16
Research Activity No. SE.32

NASA Johnson Space Center
Engineering Directorate

Research Institute for Computing and Information Systems
University of Houston - Clear Lake

T·E·C·H·N·I·C·A·L R·E·P·O·R·T

The RICIS Concept

The University of Houston-Clear Lake established the Research Institute for Computing and Information systems in 1986 to encourage NASA Johnson Space Center and local industry to actively support research in the computing and information sciences. As part of this endeavor, UH-Clear Lake proposed a partnership with JSC to jointly define and manage an integrated program of research in advanced data processing technology needed for JSC's main missions, including administrative, engineering and science responsibilities. JSC agreed and entered into a three-year cooperative agreement with UH-Clear Lake beginning in May, 1986, to jointly plan and execute such research through RICIS. Additionally, under Cooperative Agreement NCC 9-16, computing and educational facilities are shared by the two institutions to conduct the research.

The mission of RICIS is to conduct, coordinate and disseminate research on computing and information systems among researchers, sponsors and users from UH-Clear Lake, NASA/JSC, and other research organizations. Within UH-Clear Lake, the mission is being implemented through interdisciplinary involvement of faculty and students from each of the four schools: Business, Education, Human Sciences and Humanities, and Natural and Applied Sciences.

Other research organizations are involved via the "gateway" concept. UH-Clear Lake establishes relationships with other universities and research organizations, having common research interests, to provide additional sources of expertise to conduct needed research.

A major role of RICIS is to find the best match of sponsors, researchers and research objectives to advance knowledge in the computing and information sciences. Working jointly with NASA/JSC, RICIS advises on research needs, recommends principals for conducting the research, provides technical and administrative support to coordinate the research, and integrates technical results into the cooperative goals of UH-Clear Lake and NASA/JSC.

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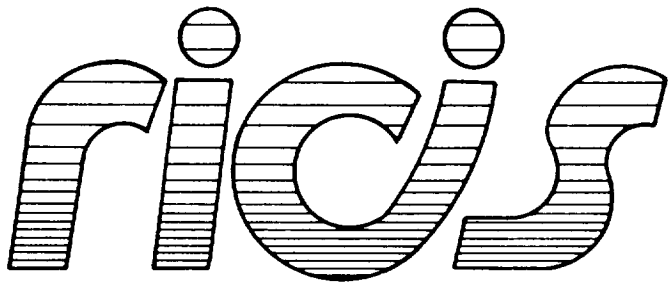

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Preface

This research was conducted under auspices of the Research Institute for Computing and Information Systems by Sue LeGrand of Planning Research Corporation. Dr. Charles McKay served as RICIS research coordinator.

Funding has been provided by the Engineering Directorate, NASA/JSC through Cooperative Agreement NCC 9-16 between NASA Johnson Space Center and the University of Houston-Clear Lake. The NASA technical monitor for this activity was Edward S. Chevers of the Engineering Directorate, NASA/JSC.

Meetings of ISO WG 9, Ada, Uniformity of Ada Applications Rapporteur Group, and Ada Europe

Ada EUROPE

The proceedings collection is listed in the bibliography. Topics included:

- Ada Application Experience
- Design Aspects
- Environments and Tools
- Reliability and Testing
- Object Oriented Design (including HOOD)
- Language Issues
- Distribution

Ada 9X

Ada 9X reports were given on a number of occasions. Erhard Ploedereder, Tartan Labs, is chairman of the Distinguished Reviewers. He listed the following revision issues:

- Predictability
- Efficiency
- Run time implementation
- Asynchronous communication
- Object oriented design
- Formal definition
- Character set
- Execution model
- Interfaces with other languages and standards

Bill Carlson, Intermetrics, is in charge of the Mapping and Revision Program. He announced that Tucker Taft will be the technical lead, and so far Ada 83 is upward compatible with all features of Ada 9X.

The schedule for Ada 9X is:

Final Mapping Document	6/91
Draft Reference Manual	6/92
Draft Rationale Document	3/92
ANSII Canvass Start	6/92
Final Reference Manual	3/93

Ada 9X Reports Due This Summer

The titles and editors are listed below. Contact the Ada Information Clearinghouse for copies.

- Character Sets - Ron Bender, DEC
- Shared Variables - Robert Dewar, NYU
- Fixed Point Arithmetic - Robert Dewar, NYU
- Pragmas and Attributes - Ken Fowler, SEI
- In/Out Issues - Karl Nyberg, Grebyn, Inc.
- Distribution - Anthony Gregaro, CSC
- Reuse - Sholem Cohen, SEI
- Real Time Scheduling - Roger Van Scoy, SEI
- Math Libraries - Jon Squire, Westinghouse
- Exceptions and Optimizations - John McHue, Computer Logic

SECURITY

Limiting the resources on a bare machine not only helps memory requirements, but it also facilitates security. There are fewer hiding places for destructive code.

In software doing floating point arithmetic, consider that the filling bits added to numbers are a good place to hide secret information. Always initialize variables to zero.

The United Kingdom Ministry of Defense has a policy for using compiler optimization for the new Air Force fighter plane. Since optimizing eliminates checks, it is allowed for mission critical systems, but not for safety critical systems.

ISO WG 9 MEETING

Representatives from 12 countries met in Dublin, Ireland. Reports were given by liaisons to other working groups and by the chairs of the Rapporteur Groups.

Memorandum of Agreement

Ada 9X liaison, Robert Dewar, reported that a memorandum of understanding between the Ada 9X project and ISO WG 9 is being drafted. See the list attached. A workbook of Ada 9X issues will be available for general issue in August.

Graphics

In graphics standards, the GKS/Ada Binding is an ISO Standard. The PHGS/Ada Binding is a Draft International Standard. ANSI is seriously considering the adoption of both of these.

"Esprit", European Strategic Programme for Research and Development in Information Technology. Commission of the European Communities.

"Esprit", European Strategic Programme for Research and Development in Information Technology "1988 Annual Report"; Commission of the European Communities, DG XII: Telecommunications, Information Industries and Innovation

ExTRA: Real Time Legal Ada Extension, 1990.

Gargaro, Anthony "Toward Supporting Distributed Systems in ADA 9X ADA-Europe Conference Dublin" June 12-14, 1990; Computer Sciences Corporation, Integrated Systems Division.

Graham, Marc H. "Guidelines for the Use of the SAME", May, 1989; Carnegie-Mellon University, Software Engineering Institute.

"ISO-IEC/JTC 1/SC 22/WG 9 Dublin Documents" June 15, 1990, Contel Technology Center.

Lynch, Barry "Ada: Experiences and Prospects", Proceeding of the Ada-Europe International Conference Dublin 12-14 June 1990, Cambridge University Press, 1990.

Moore, James W. "Conformance Criteria for the SAME Approach to Binding Ada Programs to SQL", August, 1989; Carnegie-Mellon University, Software Engineering Institute.

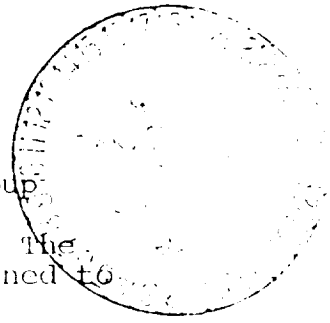
Romanski, George "Ada in Aerospace", Systeam, Your Ada Partner

Sue LeGrand

TRIP REPORT

ISO UNIFORMITY RAPPORTURE GROUP

September, 1990



The Uniformity Rapporteur Group (URG) is a technical working group which reports to the part of the International Organization for Standardization (ISO) which handles the standardization of Ada. The purpose of the URG is to fulfill an item of work which was assigned to ISO Working Group 9, Ada.

The Ada Language Standard specifically allows implementations to vary the ways that can influence the Ada program. Some of these variances are necessary to accommodate a special hardware. Many times, however, there is a most common way of implementing a feature. These are studied, discussed and recommendations are made to promote portability of Ada code.

The data base of the URG material is maintained at the National Physical Laboratory (NPL) in the United Kingdom. A list of the uniformity issues and each status is available from the High Technologies Library at University of Houston - Clear Lake. Call Lauren Gunter at (713) 283-3833.

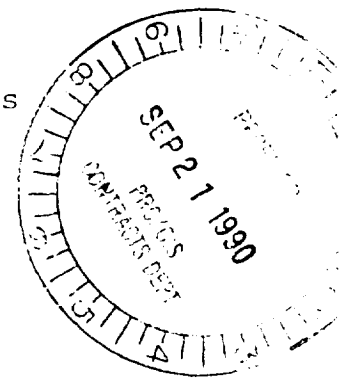
Work has been undertaken at NPL in collecting and writing test programs for the issues agreed upon by the URG. For each issue, the test program will pass if the implementation satisfies the requirements of the recommendations or fails by giving warnings of any shortcomings. These tests are available for distribution. Call Sue LeGrand (713) 282-6411 for more information on the finalized issues and available tests.

The available test programs cover the following finalized issues:

- Integer Types
- Definition of Type DURATION
- Treatment of Undefined Variables
- Files Closed Automatically on Termination
- Incorrect Order Dependencies
- Maximum Line Length
- Never Raise NUMERIC_ERROR

At the last meeting of the URG, the following issues were finalized:

- Tasking and IO
- Unchecked Conversion for Equal Sized Types
- Address Arithmetic Specifications
- Floating Point Names
- Null Address Standard Name



These last issues will be forwarded to the appropriate other groups for coordination before they become official recommendations.

Copies of the following documents were obtained at the meeting and are available from the High Technologies Library:

- POSIX Language Binding to Ada
- Ada 9X Requirements Working Draft, Version 3.3

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