AD-A167 546 ADA (TRADE NAME) COMPILER VALIDATION SUMMARY REPORT: 1/1
HONEYWELL INFORMATIO..(U) FEDERAL SOFTWARE MANAGEMENT
SUPPORT CENTER FALLS CHURCH VA 28 JAN 86

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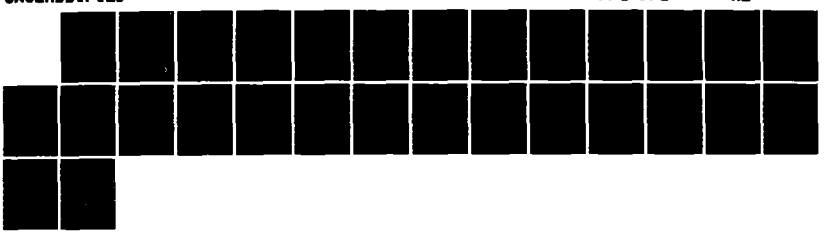

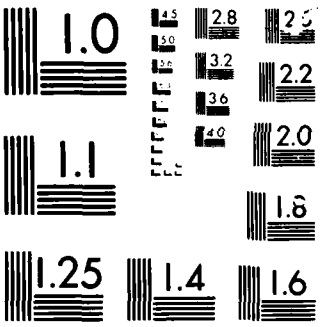
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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
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11. CONTROLLING OFFICE NAME AND ADDRESS: Ada Joint Program Office (AJPO)	12. REPORT DATE: January 28, 1986 13. NUMBER OF PAGES: 21
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number).

See attached abstract

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AD-A167 546

ABSTRACT

The purpose of this Validation Summary Report is to present the results and conclusions of performing standardized tests on the Honeywell Information Systems (HIS), GCOS 6 Ada compiler, Version 2.0. On-site testing was performed by the Federal Software Management Support Center (FSMSC)--an Ada Validation Facility-- in accordance with current Ada Validation Office policies and procedures. On-site testing was performed 15 - 22 November 1985 at Honeywell Information Systems Inc., Billerica, MA. and Lawrence, MA.

The suite of tests known as the Ada Compiler Validation Capability (ACVC), Version 1.6, was used. The ACVC suite of tests is used to validate conformance of the compiler to ANSI/MIL-STD-1815A (Ada). This standard is described in the ANSI Ada Reference Manual, January 1983. Not all tests in the ACVC test suite are applicable to this specific implementation. Also, known test errors in Version 1.6 are present in some tests; these tests were withdrawn. The purpose of the testing is to ensure that the compiler properly implements legal language constructs and that it identifies, rejects from processing, and labels illegal constructs.

The HIS GCOS 6 Ada Compiler Version 2.0, using MOD 400 Operating System releases 3.0 and 3.1, was tested with version 1.6 of the ACVC validation tests. Version 1.6 of the test suite contains 2162 tests of which 66 were withdrawn and 180 were inapplicable to this implementation. All of the 1916 remaining tests were passed.

HIS Ada Compiler was tested on those systems listed in the table below. Each system was able to host the compiler and target itself. The table represents the tested target/host relationships:

Host	Op Sys	Target	Op Sys	ACVC Portion	Test Location
DPS 6/95	3.0	DPS 6/95	3.0	Full	On-Site
		DPS 6/75	3.0	Subset	On-Site
DPS 6/95	3.1	DPS 6/95	3.1	Full	On-Site
		DPS 6/75	3.1	Subset	On-Site
DPS 6/94	3.0	DPS 6/94	3.0	Full	Pre-Val
DPS 6/94	3.1	DPS 6/94	3.1	Full	Pre-Val
DPS 6/85	3.1	DPS 6/85	3.1	Subset	On-Site
		DPS 6/75	3.1	Subset	On-Site
DPS 6/75	3.0	DPS 6/75	3.0	Subset	Pre-Val
DPS 6/75	3.1	DPS 6/75	3.1	Subset	Pre-Val
DPS 6/74	3.0	DPS 6/74	3.0	Subset	Pre-Val
DPS 6/74	3.1	DPS 6/74	3.1	Subset	Pre-Val
DPS 6/70	3.0	DPS 6/70	3.0	Subset	Pre-Val
DPS 6/70	3.1	DPS 6/70	3.1	Subset	Pre-Val

Ada* COMPILER VALIDATION SUMMARY REPORT:

Honeywell Information Systems, Inc.
GCOS 6 Ada Compiler
Version 2.0
DPS 6/95, DPS 6/94, DPS 6/85,
DPS 6/75, DPS 6/74, DPS 6/70
using MOD 400 Release 3.0 and/or Release 3.1

November 29, 1985

Prepared by:

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Prepared for:

Ada Joint Program Office
1211 South Fern St.
Arlington, Va 22202

Revised January 28, 1986

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(Ada Joint Program Office).

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Virginia L. Castor
Director
Ada Joint Program Office

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Host	Op Sys	Target	Op Sys	ACVC Portion	Test Location
DPS 6/95	3.0	DPS 6/95	3.0	Full	On-Site
		DPS 6/75	3.0	Subset	On-Site
DPS 6/95	3.1	DPS 6/95	3.1	Full	On-Site
		DPS 6/75	3.1	Subset	On-Site
DPS 6/94	3.0	DPS 6/94	3.0	Full	Pre-Val
DPS 6/94	3.1	DPS 6/94	3.1	Full	Pre-Val
DPS 6/85	3.1	DPS 6/85	3.1	Subset	On-Site
		DPS 6/75	3.1	Subset	On-Site
DPS 6/75	3.0	DPS 6/75	3.0	Subset	Pre-Val
DPS 6/75	3.1	DPS 6/75	3.1	Subset	Pre-Val
DPS 6/74	3.0	DPS 6/74	3.0	Subset	Pre-Val
DPS 6/74	3.1	DPS 6/74	3.1	Subset	Pre-Val
DPS 6/70	3.0	DPS 6/70	3.0	Subset	Pre-Val
DPS 6/70	3.1	DPS 6/70	3.1	Subset	Pre-Val

TABLE OF CONTENTS

1. Introduction

1.1 Purpose of the Validation Summary Report

This report describes the results of the validation testing for the compiler designated as GCOS 6, Version 2.0 for the following configurations:

Host Machines: DPS 6/95, DPS 6/94, DPS 6/85, DPS 6/75, DPS 6/74, and DPS 6/70.

Operating System: MOD 400, Releases 3.0 and 3.1 (6/85 Release 3.1 only)

Host Disk Systems:

DPS 6/95: MSU 9604, MSU 9602, MSU 9607

DPS 6/94: MSU 9604, MSU 9602, MSU 9607

DPS 6/85: MSU 9602

DPS 6/75: MSU 9602

DPS 6/74: MSU 9602

DPS 6/70: MSU 9602

Target Machines: DPS 6/95, DPS 6/94, DPS 6/85, DPS 6/75, DPS 6/74, and DPS 6/70.

Operating System: MOD 400, Releases 3.0 and 3.1 (6/85 Release 3.1 only)

Language Version: ANSI/MIL-STD-1815A Ada

Translator Name: GCOS 6 Ada Compiler System

Translator Version: 2.0

Validation Test Version: 1.6

Testing of this compiler was conducted by the Federal Software Management Support Center under the supervision of the Ada Validation Office (AVO), at the direction of the Ada Joint Program Office. Testing was conducted from 15-22 November, 1985 at Honeywell Information Systems, Billerica, Mass. and Lawrence, Mass. All testing was performed in accordance with AVO policies and procedures.

The purpose of this report is to document the results of the testing performed on the compiler, and in particular, to:

- identify any language constructs supported by the compilers that do not conform to the Ada standard;
- identify any unsupported language constructs required by the Ada standard; and
- describe implementation dependent behavior allowed by the standard.

1.2 Host to Target Relationship Table

The Honeywell GCOS 6 Ada Compiler was tested on those systems listed in the table below. Each system was able to host the compiler and target itself. The following table represents the tested target/host relationships:

Host	Op Sys	Target	Op Sys	ACVC Portion	Test Location
DPS 6/95	3.0	DPS 6/95	3.0	Full	On-Site
		DPS 6/75	3.0	Subset	On-Site
DPS 6/95	3.1	DPS 6/95	3.1	Full	On-Site
		DPS 6/75	3.1	Subset	On-Site
DPS 6/94	3.0	DPS 6/94	3.0	Full	Pre-Val
DPS 6/94	3.1	DPS 6/94	3.1	Full	Pre-Val
DPS 6/85	3.1	DPS 6/85	3.1	Subset	On-Site
		DPS 6/75	3.1	Subset	On-Site
DPS 6/75	3.0	DPS 6/75	3.0	Subset	Pre-Val
DPS 6/75	3.1	DPS 6/75	3.1	Subset	Pre-Val
DPS 6/74	3.0	DPS 6/74	3.0	Subset	Pre-Val
DPS 6/74	3.1	DPS 6/74	3.1	Subset	Pre-Val
DPS 6/70	3.0	DPS 6/70	3.0	Subset	Pre-Val
DPS 6/70	3.1	DPS 6/70	3.1	Subset	Pre-Val

1.3 Use of the Validation Summary Report

The Ada Validation Office may make full and free public disclosure of this report in accordance with the "Freedom of Information Act" (5 U.S.C. #552). The results of the validation apply only to the computers, operating systems, and compiler version identified in this report.

The Ada Compiler Validation Capability is used to determine insofar as is practical, the degree to which the subject compiler conforms to the Ada standard. Thus, this report is necessarily discretionary and judgemental. The United States Government does not represent or warrant that the statements, or any one of them, set forth in this report are accurate or complete, nor that the subject compiler has no other nonconformances to the Ada standard. This report is not meant to be used for the purpose of publicizing the findings summarized herein.

Any questions regarding this report or the validation tests should be sent to the Ada Validation Office at:

Ada Joint Program Office
1211 South Fern Street
Arlington, VA 22202

1.4 References

Reference Manual for the Ada Programming Language, ANSI/MIL-STD-1815A, February 1983.

Ada Validation Organization: Policies and Procedures, Mitre Corporation, June 1982, PB 83-110601.

Ada Compiler Validation Implementers' Guide, SOFTECH, Inc., October 1980.

The Ada Compiler Validation Capability, Computer, Vol. 14, No. 6, June 1981.

Using the ACVC Tests, SofTech, Inc. November 1981.

Ada Compiler Validation Plans and Procedures, SofTech, Inc. November 1981.

1.5 Definitions of Terms

Class A tests are passed if no errors are detected at compile time. Although these tests are constructed to be executable, no checks can be performed at run-time to see if the test objective has been met; this distinguishes Class A from Class C tests. For example, a Class A test might check that keywords of other languages (other than those already reserved in Ada) are not treated as reserved words by an Ada implementation.

Class B tests are illegal programs. They are passed if all the errors they contain are detected at compile-time (or link-time) and no legal statements are considered illegal by the compiler.

Class L tests consist of illegal programs whose errors cannot be detected until link time. They are passed if errors are detected prior to beginning execution of the main program.

Class C tests consist of executable self-checking programs. They are passed if they complete execution and do not report failure.

Class D tests are capacity tests. Since there are no firm criteria for the number of identifiers permitted in a compilation, number of units in a library, etc., a compiler may refuse to compile a class D test. However, if such a test is successfully compiled, it should execute without reporting a failure.

Class E tests provide information about an implementation's interpretation of the Standard. Each test has its own pass/fail criterion.

ACVC: Acronym for the Ada Compiler Validation Capability.

AVO: The Ada Validation Office. In the context of this report the AVO is responsible for directing compiler validation.

CHECK or CHECKTEST: An automated tool defined by the Federal Software Management Support Center (FSMSC) and developed by the AVF that produces summary test results by reading compiler output in a spool file.

CUSTOMER: Honeywell Information Systems, Inc.

FSMSC:	Federal Software Management Support Center. In the context of this report the FSMSC conducts Ada validations under contract to the AVO as a satellite facility.
HOST:	The computer on which the compiler executes.
IG:	ACVC Implementors' Guide.
RM:	The Ada Language Reference Manual.
STANDARD:	The standard for the Ada language, ANSI/MIL-STD-1815A (1983).
SUBSET TESTS:	A grouping of ACVC tests selected by the FSMSC. Each chapter in the ACVC is represented in the subset by between 4 to 7 tests. The subset is used for statistical sampling of the various host and target hardware configurations.
TARGET:	The computers for which the compiler generates object code.
VALIDATION:	The process of testing a compilation system to certify that it conforms to the standard.
VALIDATION TESTS:	The set of test programs used to detect non-conformances in compilation systems. In this report, the term will be used (unqualified) to mean the ACVC tests.

2. TEST ANALYSIS

The following table shows that the Honeywell Information Systems (HIS) GCOS 6 Ada compiler passed all applicable tests.

	A	B	C	D	E	L	Total
In suite	61	800	1273	17	8	3	2162
Inapplicable	0	1	177	2	0	0	180
Withdrawn	0	19	47	0	0	0	66
Passed	61	780	1049	15	8	3	1916
Failed	0	0	0	0	0	0	0

180 tests in the suite were found to be inapplicable to this implementation.

In addition, 66 tests were withdrawn from the test suite because they were incorrect.

2.1 Class A Testing

Class A tests check that legal Ada programs can be successfully compiled. These tests are executed but contain no executable self-checking capabilities.

2.1.1 Class A Test Procedures

Each class A test was separately compiled and executed. However, the only purpose of execution is to produce a message indicating that the test passed.

2.1.2 Class A Test Results

Successful compilation and execution without any error messages indicates the tests passed. All applicable tests passed.

2.2 Class B Testing

Class B tests check the ability to recognize illegal language usage.

2.2.1 Class B Test Procedures

Each Class B test was separately compiled. The resulting test compilation listings are manually examined to see whether every illegal construct in the test is detected. If some errors are not detected, a version of the program test is created that contains only undetected illegal constructs.

This revised version is recompiled and the results analyzed. If some errors are still not detected, the revision process is repeated until a revised test contains only a single previously undetected illegal construct.

A B test is considered to fail only if a version of the test containing a single illegal construct is accepted by the compiler (i.e., an illegal construct is not detected) or a version containing no errors is rejected (i.e., a legal construct is rejected).

2.2.2 Class B Test Results

Class B tests were presented to the compiler. Of these tests 1 was found to be inapplicable to this implementation; 19 tests were found to be incorrect (i.e., a conforming compiler would have failed each of these tests).

Because all errors were not detected when compiling the original tests, the following 44 tests were modified by removing the detected errors; the modified tests were then submitted again to see if the remaining errors would be detected.

B22003A.ADA	B29001A.ADA	B33001A.ADA	B33004A.ADA
B35101A.ADA	B37301A.ADA	B37302A.ADA	B51001A.ADA
B53009A.ADA	B54A01C.ADA	B55A01A.ADA	B61001R.ADA
B61001W.ADA	B66001C.ADA	B67001C.ADA	B67001D.ADA
B91001A.ADA	B91002A.ADA	B91002B.ADA	B91002C.ADA
B91002D.ADA	B91002E.ADA	B91002F.ADA	B91002G.ADA
B91002H.ADA	B91002I.ADA	B91002J.ADA	B91002K.ADA
B91002L.ADA	B950ABA.ADA	B950ABB.ADA	B97101A.ADA
B97101E.ADA	B97102A.ADA	B97103E.ADA	B97104G.ADA
BC10AEA.ADA	BC10AEB.ADA	BC10AED.ADA	BC10AFA.ADA
BC1202A.ADA	BC1202B.ADA	BC12ACA.ADA	BC20ABA.ADA

All illegal constructs were detected except in some tests that were withdrawn because of errors in the tests (see Section 4.2.6).

2.3 Class C Testing

Class C tests check that legal Ada programs are correctly compiled and executed by an implementation.

2.3.1 Class C Test Procedures

Each Class C test is separately compiled and executed. The tests are self-checking and produce PASS/FAIL messages. Any 'failed' tests are individually checked to see if they are correct and if they are applicable to the implementation. Any tests that are inapplicable or that do not conform to the Ada Standard are withdrawn.

2.3.2 Class C Test Results

All class C tests were processed except the tests that were withdrawn and tests requiring a floating point precision exceeding SYSTEM.MAX_DIGITS and those tests which contained literals greater than the maximum line length of 120 characters. All applicable tests passed.

2.4 Class D Testing

Class D tests are executable tests used to check an implementation's compilation and execution capacities. Two tests were inapplicable.

2.4.1 Class D Test Procedures

Each class D test is separately compiled and executed. The tests are self-checking and produce PASS/FAIL messages.

2.4.2 Class D Test Results

All applicable class D tests passed.

2.5 Class E Testing

Class E tests provide information about an implementation's interpretation of the Standard where the Standard permits implementations to differ. Each test has its own pass/fail criterion.

2.5.1 Class E Test Procedures

Each class E test is separately compiled and executed. The tests are self-checking and produce pass/fail messages.

2.5.2 Class E Test Results

All class E tests passed.

2.6 Class L Testing

Class L tests check that incomplete or illegal Ada programs involving multiple separately compiled source files are detected at link time and are not allowed to execute.

2.6.1 Class L Test Procedures

Each Class L test is separately compiled and execution is attempted. The tests produce FAIL messages if executed. Any "failed" tests are checked to see if they are correct and applicable to the implementation. Tests that are inapplicable or that do not conform to the Ada standard are withdrawn.

2.6.2 Class L Test Results

Of the class L tests, none were found to be inapplicable to this implementation, and none were withdrawn due to errors in the tests. All three L tests passed.

2.7 Subset Testing

A subset of the executable ACVC tests was chosen by the FSMSC and used during this validation. This subset of tests was used to test multiple configuration combinations during the validation, specifically Honeywell DPS 6/95, 6/94, 6/85, 6/75, 6/74 and 6/70 host/target relationships.

The subset comprised the following tests:

Chapter 2	Chapter 3	Chapter 4	Chapter 5
C23001A	C34001A	C41101D	C51002A
C24102A	C34001H	C42005A	C52001A
C26008A	A32203D	C43214A	C53005A
A29002A	C35904A	C45101A	C54A03A
	C36204A	C48004A	D55A03A
	C34002B		

Chapter 6	Chapter 7	Chapter 8	Chapter 9
C61003B	A71002A	A83A02A	C92002A
A62006D	C72001B	C84002A	C93001A
C63004A	C74302A	C85007E	C94006A
C65003A	C74209A	C86003A	A97106A
C66002A	C74409B	C87B48A	C97202A

Chapter 10	Chapter 11	Chapter 12	Chapter 14
CA1003A	CB1001A	CC1004A	AE2101A
CA2004A	CB2004A	CC3004A	CE2102A
CA2004A1	CB3003A	CC3408A	CE2201A
CA2004A2	CB4001A	CC3504C	CE2401E
CA2004A3			CE3102A
CA2004A4			CE3901A

*** CZ ***

CZ1101A
CZ1102A
CZ1103A
CZ1201A
CZ1201B
CZ1201C
CZ1201D

3. COMPILER ANOMALIES AND NONCONFORMANCE

There were no nonconformances to the Ada standard detected in this validation. The compiler passed all applicable correct tests.

4. ADDITIONAL INFORMATION

This section describes in more detail how the validation was concluded.

4.1 Compiler Parameters

Certain tests do not apply to all Ada compilers, e.g., compilers are not required to support several predefined floating point types, and so tests must be selected based on the predefined types an implementation actually supports. In addition, some tests are parameterized according to the maximum length allowed by an implementation for an identifier (or other lexical element; this is also the maximum line length), the maximum floating point precision supported, etc. The implementation dependent parameters used in performing this validation were:

- maximum lexical element length: 120 characters.
- maximum digits value for floating point types 15 (fifteen)
- SYSTEM.MIN_INT: -2 ** 31
- SYSTEM.MAX_INT: 2 ** 31-1
- predefined numeric types: INTEGER, FLOAT, LONG_INTEGER, LONG_FLOAT and SHORT_INTEGER.

  INTEGER_FIRST: -32768

  INTEGER_LAST: 32768
- LONG_INTEGER'FIRST: -2_147_483_648
- LONG_INTEGER'LAST: 2_147_483_647
- Source character set: ASCII
- Extended ASCII chars: abcdefghijklmnopqrstuvwxyz !$%?@[\]^{}"
- non-ascii char type: GCOS 6 Ada accepts only ASCII characters
- TEXT_IO.COUNT'LAST: 16#7FFFFFFF#
- TEXT_IO.FIELD'LAST: 35
- illegal external file name1: BAD CHAR[S]
- illegal external file name2: "TOO_LONG_A_FILE_NAME"
- SYSTEM.PRIORITY'FIRST: 0
- SYSTEM.PRIORITY'LAST: 48

4.2 Testing Information

Complete ACVC tests runs were compiled/executed at Honeywell, Information Systems, Inc., Billerica, MA. and Lawrence, MA. No attempt was made to establish cross compatibility among all configurations, but the DPS 6 product line compatibility indicates that processors validated as a host can treat any equal or lower member of the line as a target.

4.2.1 Pre-Test Procedures

Prior to testing, appropriate values for the compiler-dependent parameters were determined. These values were used to adapt tests that depend on the values. A magnetic tape containing the adapted tests was prepared and brought to the testing site. Spilt B tests were not prepared on this tape and had to be split on-site.

The HIS pre-validation consisted of two complete runs of the ACVC on the HIS DPS 6/94 running under GCOS 6 MOD 400 release 3.0 and 3.1 operating systems, and extensive subset testing of the HIS DPS 6/75, 6/74, and 6/70 as shown in the following table:

Host	Op Sys	Target	Op Sys	ACVC Portion	Test Location
DPS 6/94	3.0	DPS 6/94	3.0	Full	Pre-Val
DPS 6/94	3.1	DPS 6/94	3.1	Full	Pre-Val
DPS 6/75	3.0	DPS 6/75	3.0	Subset	Pre-Val
DPS 6/75	3.1	DPS 6/75	3.1	Subset	Pre-Val
DPS 6/74	3.0	DPS 6/74	3.0	Subset	Pre-Val
DPS 6/74	3.1	DPS 6/74	3.1	Subset	Pre-Val
DPS 6/70	3.0	DPS 6/70	3.0	Subset	Pre-Val
DPS 6/70	3.1	DPS 6/70	3.1	Subset	Pre-Val

4.2.2 Control Files

HIS provided command procedures that compiled and executed tests automatically at the HIS site. All command procedures were reviewed prior to the on-site validation.

4.2.3 On-site Data Collection

Two complete ACVC runs were made on the DPS 6/95 under both 3.0 and 3.1 operating systems. The results from the DPS 6/95 were analyzed; they were determined to be correct.

The ACVC subset groups were compiled and executed on DPS 6/85, operating system 3.1, and then that object code was run on the DPS 6/75; the results were compared and no significant differences were detected. Also object code from a subset of the tests on the DPS 6/95, operating systems 3.0 and 3.1, was successfully executed on the DPS 6/75, operating systems 3.0 and 3.1. No deviations were noted.

The following table shows the on-site tests:

Host	Op Sys	Target	Op Sys	ACVC Portion	Test Location
DPS 6/95	3.0	DPS 6/95	3.0	Full	On-Site
		DPS 6/75	3.0	Subset	On-Site
DPS 6/95	3.1	DPS 6/95	3.1	Full	On-Site
		DPS 6/75	3.1	Subset	On-Site
DPS 6/85	3.1	DPS 6/85	3.1	Subset	On-Site
		DPS 6/75	3.1	Subset	On-Site

4.2.4 Test Analysis Procedures

On completion of testing the base system, all results were analyzed for failed Class A, C, D, E, or L programs, and all class B compilation results were individually analyzed. Analysis procedures are described for each test class in chapter 2.

4.2.5 Timing Information

The real (wall clock) times required for compiling the non-executable tests and compiling, linking, and running the executable tests were:

DPS 6/95 (MOD 400, 3.1) 76 hrs 53 mins. (Includes Class B)

DPS 6/95 (MOD 400, 3.0) 73 hrs 39 mins. (Includes Class B)

4.2.6 Description of Errors in Withdrawn Tests

The following tests in version 1.6 of the ACVC did not conform to the ANSI Ada standard and were withdrawn for the reasons given below:

- B66001A-B: Test checks (in section G) that a parameterless function that is equivalent to an enumeration literal in the same declarative region is a redeclaration and, as such, is forbidden. According to RM 8.3(17), the explicit declaration of such a function is allowed if an enumeration literal is considered to be an implicitly declared predefined operation. The RM is not clear on this point. This issue has been referred to the Language Maintenance Committee for resolution. Since the issue cannot be resolved at this time, the test is withdrawn from Version 1.6. (Please note that this test may be considered correct and may appear in the future Versions of the ACVC, including Version 1.6.)

- BC1013A-B: The declaration of equality in lines 86-87 is illegal because the parameter type T declared in line 11 is not a limited type (LRM 6.7-4).

- B38105B: This test requires a specific interpretation of the Language Reference Manual (LRM) regarding whether an incomplete type can have discriminant constraints before the full type declaration; this interpretation is not fully supported by the LRM or Language Maintenance Committee.

- C45521A, C45521B, ... C45521Y (25 tests) : Cases C and I define the model interval for the result too narrowly.

- C48005C-B: Lines 38 and 63 of this test should check that the value of the designated object is null.

- C48006B: This test requires a specific interpretation of the Language Reference Manual (LRM) regarding whether an incomplete type can have discriminant constraints before the full type declaration; this interpretation is not fully supported by the LRM or Language Maintenance Committee.

- C64103C-B: This test should raise CONSTRAINT_ERROR during the conversion at line 179.

- C64103D-B: This test involves a CONSTRAINT_ERROR vs. NUMERIC__ERROR issue that is to be resolved by the Language Maintenance Committee.

- C64105E-AB: For case E, ensure that non-null dimensions of formal and actual parameters belong to both index subtypes (see AI-00313).

- C64105F-AB: For case E, ensure that non-null dimensions of formal and actual parameters belong to both index subtypes (See AI-00313).

- B67001A-B: Line 414 is missing the "BEGIN NULL; END;" needed to complete the block beginning at line 389 (case H).

- B67004A-B: The default name for a formal generic equality function should not be allowed to be "/=" unless an expanded name is used.

- B74103F-B: This test hinges on whether or not a generic formal type declaration declares a type. This matter will be debated and resolved by the Committee.

- B74207A-B: This test requires a specific interpretation of the Language Reference Manual (LRM) regarding whether an incomplete type can have discriminant constraints before the full type declaration; this interpretation is not fully supported by the LRM or Language Maintenance Committee.

- C93005A, C93005B, and C93005C: These tests contain a declaration of an interger variable whose initialization is solely for the purpose of raising an exception. Some compilers will not raise this exception due to their optimization.

. C93007B-B: This test should check for PROGRAM_ERROR rather than TASKING_ERROR (See AI-000149).

. CA1003B-AB: A compilation that contains an illegal compilation unit may now be rejected as a whole (see AI-00255/05).

. CA1011A*-B: The test objective should be reversed to be consistent with AI-00199.

. CA1108A-B: A pragma ELABORATE is needed for OTHER_PKG at line 25.

. CA1108B-B: A pragma ELABORATE is needed for FIRST_PKG at line 39 and for LATER_PKG at line 49.

. CA2009B-B, CA2009E-B: The repetition of the main procedure after the subunit body makes the subunit body obsolete; therefore, an attempt to execute the main procedure will fail.

. CA2009F*-B: The file CA2009F2-B is missing from the test suite.

. BC3204A-B, BC3204B-B, BC3204C*-B, BC3204D-B, BC3205A-B, BC3205B-B, BC3205C-B, BC3205D*-B, BC3405B-B: Instantiations with types that have default discriminants are now legal (AI-00037).

BC3503A-B. This test requires a specific interpretation of the Language Reference Manual (LRM) regarding whether an incomplete type can have discriminant contraints before the full type declaration; this interpretation is not fully supported by the LRM or Language Maintenance Committee.

CE2107E-B. This test has a variable, TEMP_HAS_TRUE, that needs to be given an initial value of TRUE.

. CE3603A-B: The last case is inconsistent with AI-00050. If the string argument is null, no attempt to read is made and END_ERROR is not raised.

. CE3604A-B: Cases 5, 8, 9, and 11 are inconsistent with AI-00050. SKIP__LINE is called only if the end of the output string has not been met.

. CE3704M-B: A superfluous SKIP_LINE causes the input and output operations to be out of synchronization.

- C35904A-B: The elaborations of the subtype declarations for SFX3 and SFX4 in this test raise NUMERIC_ERROR in some implementations. The exception is raised on the conversion of the real literals 2.0 and 5.0 to the base type of FIX.

- BA2001E*-AB: LRM 10.2(5) states that "simple names of all subunits that have the same ancestor library unit must be distinct identifiers." This test requires that the above conditions be checked when the stub is declared; but since the LRM uses the term "subunit", it is not clear that the check must be made then, as opposed to when the subunit is compiled. (There may be an LMC ruling regarding this issue.)

- BC3220B-B: This test assumes that instantiated types may be static. This assumption has been questioned, and the matter will be considered by the LMC.

4.2.7 Description of Inapplicable Tests

D4A002B 64-bit integers are not supported.

D4A004B 64-bit integers are not supported.

B86001CP SHORT_FLOAT not supported.

C24113H, C24113I, C24113J, C24113K These programs were rejected because they contain literals which exceed the maximum line length of 120 characters.

C96005B The test itself states not-applicable because DURATION'S BASE = DURATION..

CA2009COM GCOS 6 Ada requires that subunits of a generic unit be part of the same compilation.

CE2107C Test was inapplicable because a file open for output cannot be associated with more than one internal file.

CE2107D Test was inapplicable because a file open for output cannot be associated with more than one internal file.

CE2108A Was inapplicable because temporary files do not have names on this system. Therefore, calls to NAME for temporary files raise USE_ERROR.

CE2108C Was inapplicable because temporary files do not have names on this system. Therefore, calls to NAME for temporary files raise USE_ERROR.

CE2110B Test was inapplicable because implementation does not allow you to CREATE a file.

CE2111D Test was inapplicable because implementation does not allow you to CREATE a file.

CE3111B Test was inapplicable because multiple internal files may not access the same external or temporary file.

CE3111C Test was inapplicable because multiple internal files may not access the same external or temporary file.

CE3111D Test was inapplicable because multiple internal files may not access the same external or temporary file.

CE3111E Test was inapplicable because multiple internal files may not access the same external or temporary file.

CE3112A Was inapplicable because temporary files do not have names on this system. Therefore, calls to NAME for temporary files raise USE_ERROR.

CE3114B Test incorrectly reports failure when STATUS_ERROR results from attempts to DELETE unopened files.

CE3115A Test incorrectly reports failure when USE_ERROR results from attempts to CREATE files.

The following tests were inapplicable because they exceed the machine capacity using DIGITS__precision greater than MAX DIGITS = 15:

C24113L through C24113Y (14)
C35705L through C35705Y (14)
C35706L through C35706Y (14)
C35707L through C35707Y (14)
C35708L through C35707Y (14)
C35802L through C35802Y (14)
C45241L through C45241Y (14)
C45321L through C45321Y (14)
C45421L through C45421Y (14)
C45424L through C45424Y (14)
C45621L through C45621Z (15). (-155 tests, total)

C34001F SHORT_FLOAT not supported.

C35702A SHORT_FLOAT not supported.

C64103A: This test is invalid in that LG_FLOAT' LARGE may be in the range of SM_FLOAT safe numbers and therefore numeric error should not be raised. See LRM 4.5.7 para 7 & 8.

4.2.8 Information Derived from the Tests

Processing of the following tests indicated support as described below for a variety of implementation options examined by the tests.

- E24101A-B.TST: If a based integer literal has a value exceeding SYSTEM.MAX_INT, an implementation may either reject the compilation unit at compile time or raise NUMERIC_ERROR at run time. This test showed that the compiler did not reject the compilation unit at compile time and NUMERIC_ERROR was raised.

- B26005A.ADA: This test contains all the ASCII control characters in string literals. The system replaced the control characters corresponding to format effectors with a space in the listing file. All occurrences were identified with a diagnostic message by the compiler.

- D29002K-B.ADA: This test declares 713 identifiers and was passed by the compiler.

- E36202A-B.ADA and E36202B-B.ADA: These tests declare multidimensional null BOOLEAN arrays in which LENGTH of one dimension exceeds INTEGER'LAST and SYSTEM.MAX_INT, respectively. An implementation can accept this, or it can raise NUMERIC_ERROR or STORAGE_ERROR at run time. The compiler did accept the declarations and raised NUMERIC_ERROR during execution.

- D4A002A-AB.ADA and D4A002B.ADA: These tests contain universal integer calculations requiring 32 and 64 bits of accuracy, i.e., values that exceed SYSTEM.MAX_INT are used. An implementation is allowed to reject programs requiring such calculations. The compiler passed these tests.

- E43211B-B.ADA: If a bound in a non-null range of a non-null aggregate does not belong to an index subtype, then all choices may or may not be evaluated before CONSTRAINT_ERROR is raised. The compiler did not evaluate all choices before CONSTRAINT_ERROR is raised.

- E43212B-B.ADA: This test examines whether or not all choices are evaluated before subaggregates are checked for identical bounds. The compiler evaluates all subaggregates for identical bounds.

- E52103Y-B.ADA, C52104X-B.ADA, C52104Y-B.ADA: These tests declare BOOLEAN arrays with INTEGER'LAST+3 components. An implementation may raise NUMERIC_ERROR at the type declaration or STORAGE_ERROR when array objects of these types are declared, or it may accept the type and object declarations. The compiler did not raise NUMERIC_ERROR for null array with one dimension of length greater than INTEGER'LAST in E52103Y-B.

- A series of tests (D55A03*-AB.ADA) checks to see what level of loop nesting is allowed by an implementation. Tests containing up to 65 nested loops passed without exceeding the implementation's capacity.

- D56001B-AB.ADA contains blocks nested 65 levels deep. This test was passed.

- C94004A-B.ADA: This test checks to see what happens when a library unit initiates a task and a main program terminates without ensuring that the library unit's task is terminated. This test showed that such library tasks continued to execute even after the main program terminates and then terminated appropriately by themselves.

- CA1012A4M-B.DEP: This test checks whether an implementation requires generic library unit bodies to be compiled in the same compilation as the generic declaration. The compiler does allow generic declarations and bodies to be compiled in completely separate compilations.

- CE2106A-B.DEP and CE3110A-B.DEP: These tests confirm that dynamic creation and deletion of files is not supported.

- CE2107A.DEP: This test showed that more than one internal file may be associated with the same external file (for sequential and direct I/O).

- CE3111A-B.DEP showed that two internal files may read the same external file.

5. SUMMARY AND CONCLUSIONS

ACVC version 1.6 comprises 2162 tests, of which 66 were withdrawn due to errors. The Federal Software Management Support Center (FSMSC), an AVF, identified 1916 of the remaining tests to be applicable to Honeywell Information Systems Inc.'s GCOS6 Ada compiler. The compiler passed all of these tests, operating on DPS 6/95, DPS 6/94, DPS 6/85, DPS 6/75, DPS 6/74, DPS 6/70 under MOD 400 Operating System Release 3.0 and 3.1.

The FSMSC considers these results to show acceptable conformity to the Ada Language Standard.

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