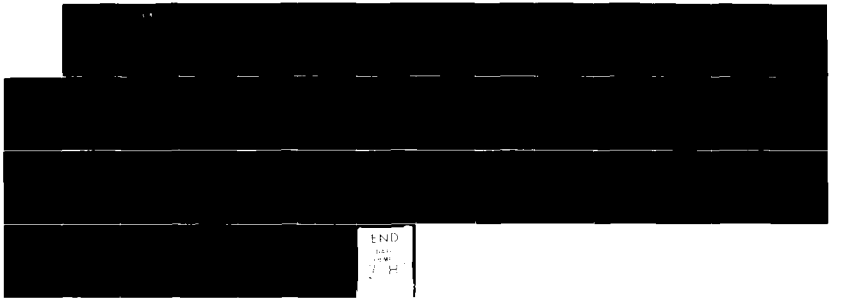
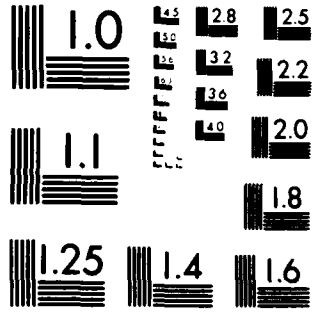
AD-A181 416 ADA (TRADENAME) COMPILER VALIDATION SUMMARY REPORT: 1/1
TELESOFT TELEGEN2 E68 (U)
INDUSTRIEANLAGEN-BETRIEBSGESELLSCHAFT M B H OTTOBRUNN
UNCLASSIFIED (GERMAN .. 24 SEP 86 F/G 12/5 NL



END



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

DTIC FILE COPY

(2)

AD-A181 416

DTIC
ELECTE
JUN 1 2 1987
S D
CMD

AVF Control Number: AVF-VSR-008

Ada* COMPILER
VALIDATION SUMMARY REPORT:

TeleSoft
TeleGen2 E68, Version 3.11
HOST: MicroVAX II
TARGETS: Motorola 68020, 68010
Tektronix 8540
(M68010 CPU)

Completion of On-Site Testing:
86-09-24

Prepared By:

Industrieanlagen-Betriebsgesellschaft mbH
Dept SZT
Einsteinstraße 20
D 8012 Ottobrunn
Federal Republic of Germany

Prepared For:

Ada Joint Program Office
United States Department of Defense
Washington, D.C.

---

* Ada is a registered trademark of the United States Government (Ada Joint Program Office)

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

87 5 8 120

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETEING FORM
1. REPORT NUMBER | 2. GOVT ACCESSION NO. ADA181416	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* Ada Compiler Validation Summary Report: TeleSoft Telegen2 E68, Version 3.11, Host: MicroVAX II TARGETS; Motorola 68020, 68010, Tektronix 8540 (M68010 CPU)	5. TYPE OF REPORT & PERIOD COVERED 24 SEPT 1986 to 24 SEPT 1987 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Industrieanlagen-Betriebsgesellschaft mbH	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION AND ADDRESS Industrieanlagen-Betriebsgessellschaft mbH, Dept SZT, Einsteinstrabe 20, d 8012 Ottobrunn Federal Republic of Germany	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Ada Joint Program Office United States Department of Defense Washington, DC 20301-3081	12. REPORT DATE 24 SEPT 1986 13. NUMBER OF PAGES 43
14. MONITORING AGENCY NAME & ADDRESS*(If different from Controlling Office)* Industrieaniagen-Betriebsgesellschaft mbH	15. SECURITY CLASS *(of this report)* UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20. If different from Report)*

UNCLASSIFIED

18. SUPPLEMENTARY NOTES

19. KEYWORDS *(Continue on reverse side if necessary and identify by block number)*

Ada Programming language, Ada Compiler Validation Summary Report, Ada Compiler Validation Capability, ACVC, Validation Testing, Ada Validation Office, AVO, Ada Validation Facility, AVF, ANSI/MIL-STD-1815A, Ada Joint Program Office, AJPO

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

See Attached.

DD FORM 1473 EDITION OF 1 NOV 65 IS OBSOLETE
1 JAN 73 S/N 0102-LF-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

EXECUTIVE SUMMARY

This Validation Summary Report (VSR) summarizes the results and conclusions of validation testing performed on the TeleSoft TeleGen2 E68, Version 3.11 Ada Compiler using Version 1.8 of the Ada Compiler Validation Capability (ACVC). This compiler is hosted on a MicroVAX II operating under MicroVMS, Version 4.2. Programs processed by this compiler may be executed on the Motorola 68010, Motorola 68020 and the Tektronix 8540 with M68010 CPU.

On site testing was performed in September 1986 at Nynäshamn, Sweden, under the direction of the Industrieanlagen Betriebsgesellschaft mbH (AVF), according to Ada Validation Organisation (AVO) policies and procedures. The AVF identified 2210 of the 2399 test in ACVC Version 1.8 to be processed during on-site testing of the compiler. The 19 tests withdrawn at the time of validation testing, as well as the 170 executable tests that make use of floating-point precision exceeding that supported by the implementation, were not processed. After the 2210 tests were processed, results for Class A, C, D, and E tests were examined for correct execution. Compilation listings for Class B tests were analyzed for correct diagnosis of syntax and semantic errors. Compilation and link results of Class L tests were analyzed for correct detection of errors. There were 202 of the processed tests determined to be inapplicable. The remaining 2008 tests were passed.

The results of validation are summarized in the following table:

RESULT	CHAPTER												TOTAL
	2	3	4	5	6	7	8	9	10	11	12	14	
Passed	102	252	334	243	161	97	136	262	107	32	217	65	2008
Failed	0	0	0	0	0	0	0	0	0	0	0	0	0
Not Appl.	14	73	86	4	0	0	3	0	23	0	1	168	372
Withdrawn	0	5	5	0	0	1	1	2	4	0	1	0	19
TOTAL	116	330	425	247	161	98	140	264	134	32	219	233	2399

The AVF concludes that these results demonstrate acceptable conformity to ANIS/MIL-STD-1815 Ada.

EXECUTIVE SUMMARY

This Validation Summary Report (VSR) summarizes the results and conclusions of validation testing performed on the TeleSoft TeleGen2 E68, Version 3.11 Ada Compiler using Version 1.8 of the Ada Compiler Validation Capability (ACVC). This compiler is hosted on a MicroVAX II operating under MicroVMS, Version 4.2. Programs processed by this compiler may be executed on the Motorola 68010, Motorola 68020 and the Tektronix 8540 with M68010 CPU.

On site testing was performed in September 1986 at Nynäshamn, Sweden, under the direction of the Industrieanlagen Betriebsgesellschaft mbH (AVF), according to Ada Validation Organisation (AVO) policies and procedures. The AVF identified 2210 of the 2399 test in ACVC Version 1.8 to be processed during on-site testing of the compiler. The 19 tests withdrawn at the time of validation testing, as well as the 170 executable tests that make use of floating-point precision exceeding that supported by the implementation, were not processed. After the 2210 tests were processed, results for Class A, C, D, and E tests were examined for correct execution. Compilation listings for Class B tests were analyzed for correct diagnosis of syntax and semantic errors. Compilation and link results of Class L tests were analyzed for correct detection of errors. There were 202 of the processed tests determined to be inapplicable. The remaining 2008 tests were passed.

The results of validation are summarized in the following table:

RESULT	CHAPTER												TOTAL
	2	3	4	5	6	7	8	9	10	11	12	14	
Passed	102	252	334	243	161	97	136	262	107	32	217	65	2008
Failed	0	0	0	0	0	0	0	0	0	0	0	0	0
Not Appl.	14	73	86	4	0	0	3	0	23	0	1	168	372
Withdrawn	0	5	5	0	0	1	1	2	4	0	1	0	19
TOTAL	116	330	425	247	161	98	140	264	134	32	219	233	2399

The AVF concludes that these results demonstrate acceptable conformity to ANIS/MIL-STD-1815 Ada.

DTIC COPY INSPECTED

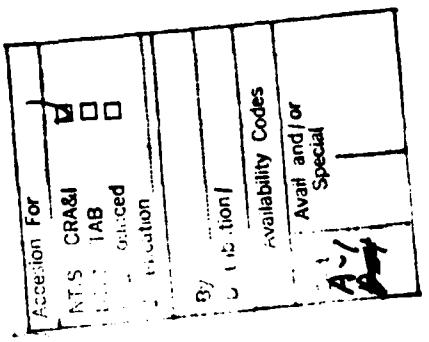


TABLE OF CONTENTS

CHAPTER 1		INTRODUCTION	5
	1.1	PURPOSE OF THIS VALIDATION SUMMARY REPORT .	6
	1.2	USE OF THIS VALIDATION SUMMARY REPORT	6
	1.3	REFERENCES	7
	1.4	DEFINITION OF TERMS	8
	1.5	ACVC TEST CLASSES.....	9
CHAPTER 2		CONFIGURATION INFORMATION	12
	2.1	CONFIGURATION TESTED.....	12
	2.2	IMPLEMENTATION CHARACTERISTICS.....	13
CHAPTER 3		TEST INFORMATION	17
	3.1	TEST RESULTS.....	17
	3.2	SUMMARY OF TEST RESULTS BY CLASS.....	17
	3.3	SUMMARY OF TEST RESULTS BY CHAPTER.....	18
	3.4	WITHDRAWN TESTS.....	18
	3.5	INAPPLICABLE TESTS.....	18
	3.6	SPLIT TESTS.....	21
	3.7	ADDITIONAL TESTING INFORMATION.....	22
	3.7.1	Prevalidation.....	22
	3.7.2	Test Method.....	22
APPENDIX A		COMPLIANCE STATEMENT	25
APPENDIX B		IMPLEMENTATION DEPENDENCIES	28
APPENDIX C		TEST PARAMETERS	36
APPENDIX D		WITHDRAWN TESTS	37
APPENDIX E		SUBSET LIST	39
APPENDIX F		SAMPLE SCRIPT	41
APPENDIX G		CONFIGURATION DIAGRAM	44

CHAPTER 1

INTRODUCTION

This Validation Summary Report (VSR) describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A. This report explains all technical terms used within it and thoroughly reports the results of testing this compiler using the Ada Compiler Validation Capability (ACVC). An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard.

Even though all validated Ada compilers conform to the Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencies -- for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from characteristics of particular operating systems, hardware, or implementation strategies. All of the dependencies observed during the process of testing this compiler are given in this report.

The information in this report is derived from the test results produced during validation testing. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results. The purpose of validating is to ensure conformity of the compiler to the Ada Standard by testing that the compiler properly implements legal language constructs and that it identifies and rejects illegal language constructs. The testing also identifies behavior that is implementation dependent but permitted by the Ada Standard. Six classes of tests are used. These tests are designed to perform checks at compile time, at link time, and during execution.

1 INTRODUCTION

1.1 PURPOSE OF THIS VALIDATION SUMMARY REPORT

This VSR documents the results of the validation testing performed on an Ada compiler. Testing was carried out for the following purposes:

- To identify any language constructs supported by the compiler that do not conform to the Ada Standard
- To attempt to identify any unsupported language constructs required by the Ada Standard
- To determine that the implementation-dependent behavior is allowed by the Ada Standard

Testing of this compiler was conducted by the AVF according to policies and procedures established by the Ada Validation Office (AVO). On-site testing was conducted at Nynäshamn and completed on 86-09-24.

1.2 USE OF THIS VALIDATION SUMMARY REPORT

Consistent with the national laws of the originating country, the AVO may make full and free public disclosure of this report. In the United States, this is provided in accordance with the "Freedom of Information Act" (5 U.S.C. no.522). The results of this validation apply only to the computers, operating systems, and compiler versions identified in this report.

The organizations represented on the signature page of this report do not represent or warrant that any statement or statements set forth in this report are accurate or complete, or that the subject compiler has no nonconformances to the Ada Standard other than those presented. Copies of this report are available to the public from:

Ada Information Clearinghouse
Ada Joint Program Office
OUSDRE
The Pentagon, Rm 3D-139 (Fern Street)
Washington DC 20301-3081

or from:

IABG m.b.H., Dept SZT
Einsteinstrasse 20
D-8012 Ottobrunn
Federal Republic of Germany

Questions regarding this report or the validation test results should be directed to the AVF listed above or to:

Ada Validation Organization
Institute for Defense Analyses
1801 North Beauregard Street
Alexandria, VA 22311

1.3 REFERENCES

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

2. Ada Validation Organization: Policies and Procedures, MITRE Corporation, Jun 1982, PB 83-110601.

3. Ada Compiler Validation Implementer's Guide, SofTech, Inc., Dec 1984.

1.4 DEFINITION OF TERMS

ACVC	The Ada Compiler Validation Capability. A set of programs that evaluates the conformity of a compiler to the Ada language specification, ANSI/MIL-STD-1815A.
Ada Standard	ANSI/MIL-STD-1815A, February 1983.
Applicant	The agency requesting validation.
AVF	The Ada Validation Facility. In the context of this report, the AVF is responsible for conducting compiler validations according to established policies and procedures.
AVO	The Ada Validation Organization. In the context of this report, the AVO is responsible for setting policies and procedures for compiler validations.
Compiler	A processor for the Ada language. In the context of this report, a compiler is any language processor, including cross-compilers, translators, and interpreters.
Failed test	A test for which the compiler generates a result that demonstrates nonconformance to the Ada Standard.
Host	The computer on which the compiler resides.
Inapplicable test	A test that uses features of the language that a compiler is not required to support or may legitimately support in a way other than the one expected by the test.
Passed test	A test for which a compiler generates the expected result.
Target	The computer for which a compiler generates code.
Test	A program that checks a compiler's conformity regarding a particular feature or features to the Ada Standard. In the context of this report, the term is used to designate a single test, which may comprise one or more files.

Withdrawn test	A test found to be incorrect and not used to check conformity to the Ada language specification. A test may be incorrect because it has an invalid test objective, fails to meet its test objective, or contains illegal or erroneous use of the language.

1.5 ACVC TEST CLASSES

Conformity to the Ada Standard is measured using the ACVC. The ACVC contains both legal and illegal Ada programs structured into six test classes: A, B, C, D, E, and L. The first letter of a test name identifies the class to which it belongs. Class A, C, D, and E tests are executable, and special program units are used to report their results during execution. Class B tests are expected to produce compilation errors. Class L tests are expected to produce link errors.

Class A tests check that legal Ada programs can be successfully compiled and executed. However, no checks are performed during execution to see if the test objective has been met. For example, a Class A test checks that reserved words of another language (other than those already reserved in the Ada language) are not treated as reserved words by an Ada compiler. A Class A test is passed if no errors are detected at compile time and the program executes to produce a PASSED message.

Class B tests check that a compiler detects illegal language usage. Class B tests are not executable. Each test in this class is compiled and the resulting compilation listing is examined to verify that every syntax or semantic error in the test is detected. A Class B test is passed if every illegal construct that it contains is detected by the compiler.

Class C tests check that legal Ada programs can be correctly compiled and executed. Each Class C test is self-checking and produces a PASSED, FAILED, or NOT APPLICABLE message indicating the result when it is executed.

Class D tests check the compilation and execution capacities of a compiler. Since there are no capacity requirements placed on a compiler by the Ada Standard for some parameters -- for example, the number of identifiers permitted in a

compilation or the number of units in a library -- a compiler may refuse to compile a Class D test and still be a conforming compiler. Therefore, if a Class D test fails to compile because the capacity of the compiler is exceeded, the test is classified as inapplicable. If a Class D test compiles successfully, it is self-checking and produces a PASSED or FAILED message during execution.

Each Class E test is self-checking and produces a NOT APPLICABLE, PASSED, or FAILED message when it is compiled and executed. However, the Ada Standard permits an implementation to reject programs containing some features addressed by Class E tests during compilation. Therefore, a Class E test is passed by a compiler if it is compiled successfully and executes to procedure a PASSED message, or if it is rejected by the compiler for an allowable reason.

Class L tests check that incomplete or illegal Ada programs involving multiple, separately compiled units are detected and not allowed to execute. Class L tests are compiled separately and execution is attempted. A Class L test passes if it is rejected at link time -- that is, an attempt to execute the main program must generate an error message before any declarations in the main program or any units referenced by the main program are elaborated.

Two library units, the package REPORT and the procedure CHECK_FILE, support the self-checking features of the executable tests. The package REPORT provides the mechanism by which executable tests report PASSED, FAILED, or NOT APPLICABLE results. It also provides a set of identity functions used to defeat some compiler optimizations allowed by the Ada Standard that would circumvent a test objective. The procedure CHECK_FILE is used to check the contents of text files written by some of the Class C tests for chapter 14 of the Ada Standard. The operation of these units is checked by a set of executable tests. These tests produce messages that are examined to verify that the units are operating correctly. If these units are not operating correctly, then the validation is not attempted.

The text of the tests in the ACVC follow conventions that are intended to ensure that the tests are reasonably portable without modification. For example, the tests make use of only the basic set of 55 characters, contain lines with a maximum length of 72 characters, use small numeric values, and place features that may not be supported by all implementations in separate tests. However, some tests contain

values that require the test to be customized according to implementation-specific values -- for example, an illegal file name. A list of the values used for this validation are listed in Appendix C.

A compiler must correctly process each of the tests in the suite and demonstrate conformity to the Ada Standard by either meeting the pass criteria given for the test or by showing that the test is inapplicable to the implementation. Any test that was determined to contain an illegal language construct or an erroneous language construct is withdrawn from the ACVC and, therefore, is not used in testing a compiler. The tests withdrawn at the time of validation are given in Appendix D.

CHAPTER 2

CONFIGURATION INFORMATION

2.1 CONFIGURATION TESTED

The candidate compilation system for this validation was tested under the following configuration (see Appendix G for a diagram).

Compiler: TeleSoft TeleGen2 E68, Version 3.11

ACVC: 1.8

Certificate Expiration Date: 87-12-17

Host Compiler:

Machine:	MicroVAX II
Operating System:	MicroVMS, Version 4.2
Memory Size:	7 Mbytes

DEC-NET connection to VAX 11/750 for tape reading and line printing.

Target Computers

(1) Target System Motorola 68010

The 68010 target system consists of an MC 68010 CPU mounted on a VME bus printed circuit board with 256 Kb of memory. Floating point operations are handled by software, written in assembler and interfaced from the code-generator as part of the run-time system.

(2) Target System Motorola 68020

The 68020 target system consists of an MC 68020 CPU mounted on a VME bus printed circuit board with 256 Kb of memory. Floating point operations are handled by software, written in assembler and interfaced from the code-generator as part of the run-time system.

(3) Target System Tektronix 8540

In the Tektronix 8540 Emulator Station the probe contains an MC 68010 CPU. Floating point operations are handled by software, written in assembler and interfaced from the code-generator as part of the run-time system. This system had 192 Kb of memory.

The targets were run without operating systems. The Motorola machines contain basic service routines for host target communication on PROM storage. On the Tektronix system the M68010 Emulator V2.0 is used for host target communication.

2.2 IMPLEMENTATION CHARACTERISTICS

One of the purposes of validating compilers is to determine the behavior of a compiler in those areas of the Ada Standard that permit implementations to differ. Class D and E tests specifically check for such implementation differences. However, tests in other classes also characterize an implementation. This compiler is characterized by the following interpretations of the Ada Standard:

- Capacities.

  The compiler correctly processes tests containing loop statements nested to 65 levels, block statements nested to 65 levels, and recursive procedures separately compiled as subunits nested to 17 levels. It correctly processes a compilation containing 722 variables in the same declarative part. (See tests D55A03A..H (8 tests), D56001B, D64005E..G (3 tests), and D29002K.)

- Universal integer calculations.

  An implementation is allowed to reject universal integer calculations having values that exceed SYSTEM.MAX_INT. This implementation does not reject such calculations and processes them correctly. (See tests D4A002A, D4A002B, D4A004A, and D4A004B.)

. Predefined types.

This implementation supports the additional predefined types LONG_INTEGER and LONG_FLOAT in the package STANDARD. (See tests B86001C and B86001D.)

. Based literals.

An implementation is allowed to reject a based literal with a value exceeding SYSTEM.MAX_INT during compilation, or it may raise NUMERIC_ERROR or CONSTRAINT_ERROR during execution. This implementation raises NUMERIC_ERROR during execution. (See test E24101A.)

. Array types.

An implementation is allowed to raise NUMERIC_ERROR or CONSTRAINT_ERROR for an array having a 'LENGTH that exceeds STANDARD.INTEGER'LAST and/or SYSTEM.MAX_INT.

A packed BOOLEAN array having a 'LENGTH exceeding INTEGER'LAST raises no exception when declared or used. (See test C52103X.)

A packed two-dimensional BOOLEAN array with more than INTEGER'LAST components raises CONSTRAINT_ERROR when the length of a dimension is calculated and exceeds INTEGER'LAST. (See test C52104Y.)

A null array with one dimension of length greater than INTEGER'LAST may raise NUMERIC_ERROR or CONSTRAINT_ERROR either when declared or assigned. Alternately, an implementation may accept the declaration. However, lengths must match in array slice assignments. This implementation raises CONSTRAINT_ERROR when array objects are assigned. (See test E52103Y.)

In assigning one-dimensional array types, the expression appears to be evaluated in its entirety before CONSTRAINT_ERROR is raised when checking whether the expression's subtype is compatible with the target's subtype. In assigning two-dimensional array types, the expression does not appear to be evaluated in its entirety before CONSTRAINT_ERROR is raised when checking whether the expression's subtype is compatible with the target's subtype. (See test C52013A.)

. Discriminated types.

During compilation, an implementation is allowed to either accept or reject an incomplete type with discriminants that is used in an access type definition with a compatible discriminant constraint. This implementation accepts such subtype indications. (See test E38104A.)

In assigning record types with discriminants, the expression appears to be evaluated in its entirety before CONSTRAINT_ERROR is raised when checking whether the expression's subtype is compatible with the target's subtype. (See test C52013A.)

. Aggregates.

In the evaluation of a multi-dimensional aggregate, the order in which choices are evaluated and index subtype checks are made appears to depend upon the aggregate itself. (See tests C43207A and C43207B.)

In the evaluation of an aggregate containing subaggregates, all choices are not evaluated before being checked for identical bounds. (See test E43212B.)

All choices are evaluated before CONSTRAINT_ERROR is raised if a bound in a nonnull range of a nonnull aggregate does not belong to an index subtype. (See test E43211B.)

. Functions.

An implementation may allow the declaration of a parameterless function and an enumeration literal having the same profile in the same immediate scope, or it may reject the function declaration. If it accepts the function declarations, the use of the enumeration literal's identifier denotes the function. This implementation accepts the declarations. (See test E66001D.)

. Representation clauses.

The Ada Standard does not require an implementation to support representation clauses. If a representation clause is not supported, then the implementation must reject it. While the operation of representation clauses is not checked by Version 1.8 of the ACVC, they are used in testing other language features. This implementation accepts 'SIZE and 'STORAGE_SIZE for tasks; it rejects

'STORAGE_SIZE for collections, and 'SMALL clauses. Enumeration representation clauses appear not to be supported. (See tests C55B16A, C87B62A, C87B62B, C87B62C, and BC1002A.)

- Pragmas.

  The pragma INLINE is not supported for procedures. The pragma INLINE is not supported for functions. (See tests CA3004E and CA3004F.)

- Input/output.

  The package SEQUENTIAL_IO cannot be instantiated with unconstrained array types and record types with discriminants. The package DIRECT_IO cannot be instantiated with unconstrained array types and record types with discriminants without defaults. (See tests AE2101C, AE2101H, CE2201D, CE2201E, and CE2401D.)

  The target computers are not equipped with permanent mass storage and the Ada Run Time Systems do not provide file systems. No files - permanent or temporary - can be created. Any attempt to create a file raises USE_ERROR.

- Generics.

  Generic subprogram declarations and bodies cannot be compiled in separate compilations. (See test CA2009F.)

  Generic package declarations and bodies cannot be compiled in separate compilations. (See tests CA2009C and BC3205D.)

CHAPTER 3

TEST INFORMATION

3.1 TEST RESULTS

Version 1.8 of the ACVC contains 2399 tests. When validation testing of the TeleSoft TeleGen2 E68 was performed, 19 tests had been withdrawn. The remaining 2380 tests were potentially applicable to this validation. The AVF determined that 372 tests were inapplicable to this implementation, and that the 2008 applicable tests were passed by the implementation.

The AVF concludes that the testing results demonstrate acceptable conformity to the Ada Standard.

3.2 SUMMARY OF TEST RESULTS BY CLASS

RESULT	TEST CLASS						TOTAL
	A	B	C	D	E	L	
Passed	66	862	1022	17	10	31	2008
Failed	0	0	0	0	0	0	0
Not Appl.	3	5	346	0	3	15	372
Withdrawn	0	7	12	0	0	0	19
TOTAL	69	874	1380	17	13	46	2399

3.3 SUMMARY OF TEST RESULTS BY CHAPTER

RESULT	CHAPTER												TOTAL
	2	3	4	5	6	7	8	9	10	11	12	14	
Passed	102	252	334	243	161	97	136	262	107	32	217	65	2008
Failed	0	0	0	0	0	0	0	0	0	0	0	0	0
Not Appl.	14	73	86	4	0	0	3	0	23	0	1	168	372
Withdrawn	0	5	5	0	0	1	1	2	4	0	1	0	19
TOTAL	116	330	425	247	161	98	140	264	134	32	219	233	2399

3.4 WITHDRAWN TESTS

The following 19 tests were withdrawn from ACVC Version 1.8 at the time of this validation:

C32114A	C41404A	B74101B
B33203C	B45116A	C87B50A
C34018A	C48008A	C92005A
C35904A	B49006A	CA3005A..D (4 tests)
B37401A	B4A010C	BC3204C
		C940ACA

See Appendix D for the reason that each of these tests was withdrawn.

3.5 INAPPLICABLE TESTS

Some tests do not apply to all compilers because they make use of features that a compiler is not required by the Ada Standard to support. Others may depend on the result of another test that is either inapplicable or withdrawn. For this validation attempt, 372 tests were inapplicable for the reasons indicated:

- C34001D, B52004E, B55B09D and C55B07B use SHORT_INTEGER which is not supported by this compiler.

- C34001F and C35702A use SHORT_FLOAT which is not supported by this compiler.

- C55B16A makes use of an enumeration representation clause containing noncontiguous values which is not supported by this compiler.

- B86001D requires a predefined numeric type other than those defined by the Ada language in package STANDARD. There is no such type for this implementation.

- C86001F redefines package SYSTEM, but the test cannot be executed since the package REPORT is dependent on the package SYSTEM.

- C87B62B uses a length clause to sepcify 'STORAGE_SIZE. The length clause is rejected during compilation.

- CA1012A compiles generic subroutine declarations and bodies in separate compilations. Separate compilation of generic specifications and bodies is not supported by this compiler.

  CA2009C, CA2009F, and BC2205D compile generic subunits in separate compilation files. Separate compilation of generic specifications and bodies is not supported by this compiler.

- BA1011C, LA5008A..K (11 tests), LA5008M..N (2 tests) require generic specifications and bodies to be in the different compilation files which is not supported by this compiler.

- CA3004E, EA3004C, and LA3004A use INLINE pragma for procedures which is not supported by this compiler.

- CA3004F, EA3004D, and LA3004B use INLINE pragma for functions which is not supported by this compiler.

- AE2101C, CE2201D, and CE2201E use instantiation of package SEQUENTIAL_IO with unconstrained array types which is not supported by this compiler.

- AE2101H and CE2401D use instantiation of package DIRECT_IO with unconstrained array types which is not supported by this compiler.

. The following 163 tests attempt to check operations on files. The checking is impossible because every create operation raises USE_ERROR.

AE3101A	CE2102C	CE2102G
CE2104A	CE2104B	CE2104C
CE2104D	CE2105A	CE2106A
CE2107A	CE2107B	CE2107C
CE2107D	CE2107E	CE2107F
CE2108A	CE2108B	CE2108C
CE2108D	CE2109A	CE2110A
CE2110B	CE2110C	CE2111A
CE2111B	CE2111C	CE2111D
CE2111E	CE2111G	CE2111H
CE2201A	CE2201B	CE2201C
CE2201F	CE2202A	CE2204A
CE2204B	CE2210A	CE2401A
CE2401B	CE2401C	CE2401E
CE2401F	CE2404A	CE2405B
CE2406A	CE2407A	CE2408A
CE2409A	CE2410A	CE3102A
CE3102B	CE3103A	CE3104A
CE3107A	CE3108A	CE3108B
CE3109A	CE3110A	CE3111A
CE3111B	CE3111C	CE3111D
CE3111E	CE3112A	CE3112B
CE3114A	CE3114B	CE3115A
CE3203A	CE3208A	CE3301A
CE3301B	CE3301C	CE3302A
CE3305A	CE3402A	CE3402B
CE3402C	CE3402D	CE3403A
CE3403B	CE3403C	CE3403E
CE3403F	CE3404A	CE3404B
CE3404C	CE3405A	CE3405B
CE3405C	CE3405D	CE3406A
CE3406B	CE3406C	CE3406D
CE3407A	CE3407B	CE3407C
CE3408A	CE3408B	CE3408C
CE3409A	CE3409C	CE3409D
CE3409E	CE3409F	CE3410A
CE3410C	CE3410D	CE3410E
CE3410F	CE3411A	CE3412A
CE3413A	CE3413C	CE3602A
CE3602B	CE3602C	CE3602D
CE3603A	CE3604A	CE3605A
CE3605B	CE3605C	CE3605D
CE3605E	CE3606A	CE3606B
CE3704A	CE3704B	CE3704D

CE3704E	CE3704F	CE3704M
CE3704N	CE3704O	CE3706D
CE3706F	CE3804A	CE3804B
CE3804C	CE3804D	CE3804E
CE3804G	CE3804I	CE3804K
CE3804M	CE3805A	CE3805B
CE3806A	CE3806D	CE3806E
CE3905A	CE3905B	CE3905C
CE3905L	CE3906A	CE3906B
CE3906C	CE3906E	CE3906F
EE3102C		

- The following 170 tests make use of floating-point precision that exceeds the maximum of 15 supported by the implementation:

  C24113L..Y (14 tests)
  C35705L..Y (14 tests)
  C35706L..Y (14 tests)
  C35707L..Y (14 tests)
  C35708L..Y (14 tests)
  C35802L..Y (14 tests)
  C45241L..Y (14 tests)
  C45321L..Y (14 tests)
  C45421L..Y (14 tests)
  C45424L..Y (14 tests)
  C45521L..Z (15 tests)
  C45621L..Z (15 tests)

3.6 SPLIT TESTS

If one or more errors do not appear to have been detected in a Class B test because of compiler error recovery, then the test is split into a set of smaller tests that contain the undetected errors. These splits are then compiled and examined. The splitting process continues until all errors are detected by the compiler or until there is exactly one error per split. Any Class A, Class C, or Class E test that cannot be compiled and executed because of its size is split into a set of smaller subtests that can be processed.

19 splits were required for Class B tests. No splits were required for tests in the other classes.

B49006B	B71001E	B71001K
B71001Q	B71001W	B97101A
B97101E	BA1101C	BA3006A
BA3006B	BA3007B	BA3008A
BA3008B	BA3013A	

3.7 ADDITIONAL TESTING INFORMATION

3.7.1 Prevalidation

Prior to validation, a set of test results for ACVC Version 1.8 produced by the TeleSoft TeleGen2 E68 Ada Compiler was submitted to the AVF by the applicant for review. Analysis of these results demonstrated that the compiler successfully passed all applicable tests, and the compiler exhibited the expected behavior on all inapplicable tests.

3.7.2 Test Method

Testing of TeleSoft TeleGen2 E68 using ACVC Version 1.8 was conducted on-site by a validation team from the AVF. The configuration consisted of a MicroVAX II operating under MicroVMS Version 4.2 and a Motorola 68010 without operating system. The host and target computers were linked via RS232. The following configurations involving the same host computer and the same communications network were also tested using a subset (see Appendix E) of the ACVC:

Motorola 68020
Tektronix 8540 with M68010 CPU

The second diagram of Appendix G shows how the Ada Systems for these configurations are related to the Ada System which was fully tested.

A set of magnetic tapes containing all tests except for withdrawn tests and tests requiring unsupported floating-point precisions was taken on-site by the validation team for processing. The set of magnetic tapes contained tests that make use of implementation-specific values were customized before being written to the set of magnetic tapes. Tests requiring splits were included in their split form on the set of magnetic tapes except for B49006B.

The report package body was modified in order to avoid downloading code for text_IO for every executable test. The modified package passed the CZ-tests. CZ1103A was ruled inapplicable because it attempts to create a file.

The magnetic tapes were read on a VAX 11/750. They were then transferred to the host computer's disk system via DEC-NET.

After the test files were loaded to disk, the full set of tests was compiled, and all executable tests were linked on the host computer. Executable images were transferred to the target computers via RS232. Results were picked up by the host computer via RS232 and transferred to a VAX 11/750 via DEC-NET where they were printed.

The compiler was tested using command scripts provided by TeleLOGIC and reviewed by the validation team. A more detailed explanation of the command script is given in Appendix F. The following options were in effect for testing:

```
B-tests:
        TSADA/E68/PROCEED/MONITOR/VIRTUAL=3000/LIST
Other Tests:
        TSADA/E68/PROCEED/MONITOR/VIRTUAL=3000
```

Linker options for M68010 and M68020 targets

```
        LOCATE/AT=%X100500
        INPUT/OFM ENVCLERC
        !
        DEFINE/ADA_VECTOR_BASE=%X100000
        DEFINE/ADADBG$STRAP=%XEEC766
        !
        DEFINE/ADA_USER_STACK_LOCATION=%X11C000
        DEFINE/ADA_USER_STACK_SIZE=%X11F00
        !
        DEFINE/ADA_INTERRUPT_STACK_LOCATION=%X12DF00
        DEFINE/ADA_INTERRUPT_STACK_SIZE=%X100
        !
        DEFINE/ADA_HEAP_LOCATION=%X12E000
        DEFINE/ADA_HEAP_SIZE=%X12000
```

A slightly different set of options was used for two CE-tests and one CZ-test.

Linker options for Tektronix system

```
;
-D ADA_HEAP_LOCATION=2700
-D ADA_HEAP_SIZE=9000
;
-D ADA_INTERRUPT_ST=27000
-D ADA_INTERRUPT$ST=20
;
D ADA_VECTOR_BASE=00000
;
-m ada.code=0-24fff
;
```

Tests were compiled, linked, and executed (as appropriate) using a single host computer and 4 identical target computers. Test output, compilation listings, and job logs were captured on magnetic tape and archived at the AVF. The listings examined on-site by the validation team were also archived.

APPENDIX A

COMPLIANCE STATEMENT

TeleLOGIC has submitted the following compliance statement concerning the TeleSoft TeleGen2 E68 Ada Compiler.

IABG Dept SZT, att Dr Stephan Heilbrunner
Ada Validation Facility
Einsteinstrasse 20
D-8012 Ottobrunn
Deutsche Bundesrepublik

Validation of TeleGen2 for Cross-Compilation from VAX/VMS to embedded Motorola 68010, Motorola 68020 and Tektronix 8540

Dear Sirs:

TeleLOGIC hereby certifies that this Ada compiler passes all applicable ACVC 1.8 tests required for formal validation. All pertinent information is enclosed.

The details of the validation are as follows:

1. Environment

The validation is run on the Host/Target configuration specified below.

The equipment is on the premises at TeleLOGIC in Nynashamn and will be available for your inspection during the validation visit.

2. Host/Target Configuration

We plan to run the validation tests in parallel from one host system to 3 different target systems with the following configurations:

Host System MINADA:

MicroVAX II running Micro VMS 4.2.
7 megabytes of main memory.
730 Mb of disk memory.
Cassette tape station TK50.
DECNet connection to VAX 750 system with line-printer.
No local printing facility.

Target System HERA:

1 Motorola 68010 CPU
256 kilobytes of RAM memory.
Resident monitor in PROM storage.
RS232 connection to 1 host tty port for down-line loading
and reporting results.

Target System JUNO:

1 Motorola 68020 CPU
256 kilobytes of RAM memory.
Resident monitor in PROM storage.
RS232 connection to 1 host tty port for down-line loading and reporting results.

Target System KIRKE:

Tektronix 8540 with Motorola 68010 CPU.
192 kilobytes of RAM memory.
Host-target connection using Tektronix ICOM40.

The host is connected to the targets as depicted in figure 1. The host is placed in a room adjacent to the laboratory where the targets are located. Each target is mounted in a separate desktop cabinet.

The compiler system is configured according to figure 2. The differences are in the linkers, the run-time support and in the target monitor systems.

A full prevalidation run was performed on system HERA. For JUNO and KIRKE a selected set of tests was run according to your directives.

3. The information relevant for "Appendix F of the LRM" can be found in the User's Guide (chapter 14 - LRM annotations). The list of values used as parameters to the 'TST' tests are given in Attachment A.

4. No deliberate extensions have been made to the Ada language standard.

5. Public release of the validation results is welcomed.

We wish that in all forthcoming references to this validation, the keyword should be "Telesoft", since this is a compiler in the family of portable Ada-technology from Telesoft.

6. We agree to continue to comply with the Ada trademark policy, as defined by the Ada Joint Program Office.

7. All applicable tests in the 1.8 ACVC test suite have been passed, with the exception of a small number of disputed tests, listed in Attachment B. Since no input-output to external files is supported on the targets, most of the tests in group CE have induced raise of "use error".

8. All tests were run using the same set of options. The setting of some options used in running the tests varies with the nature of the compilation module. A list of these options is contained in Attachment C.

9. Payment for the validation services will be made as invoiced by you.

10. TeleLOGIC appreciates your cooperation and consultation in achieving this milestone in our validation efforts.

Stefan Björnson

APPENDIX B

IMPLEMENTATION DEPENDENCIES

The only allowed implementation dependencies correspond to implementation-dependent pragmas, to certain machine-dependent conventions as mentioned in chapter 13 of MIL-STD-1815A, and to certain allowed restrictions on representation classes. The implementation-dependent characteristics of the TeleSoft TeleGen2 E68,Version 3.11, are described in the following sections which discuss topics in Appendix F of the Ada Language Reference Manual (ANSI/MIL-STD-1815A). they are taken from the compiler's User Manual. Implementation-specific portions of the package STANDARD are also included in this appendix.

The following additional quantities should be noted

```
DURATION'SMALL       :   2**(-14)
FLOAT'EPSILON        :   1.2*10**(-38))
FLOAT'LARGE          :   3.4*10**38
FLOAT'SMALL          :   -FLOAT'LARGE
LONG_FLOAT'EPSILON   :   2.2*10**(-308)
LONG_FLOAT'LARGE     :   18*10**307
LONG_FLOAT'SMALL     :   -LONG_FLOAT'LARGE
```

APPENDIX C: LRM ANNOTATIONS

APPENDIX CONTENTS

C LRM ANNOTATIONS C-1
C.1 LRM Chapter 2 ..... C-1
C.2 LRM Chapter 3 ..... C-1
C.3 LRM Chapter 4 ..... C-2
C.4 LRM Chapter 9 ..... C-2
C.5 LRM Chapter 10 ..... C-3
C.6 LRM Chapter 11 ..... C-3
C.7 LRM Chapter 13 ..... C-3
C.8 LRM Appendix A C-4
C.9 LRM Appendix F C-4
C.9.1 Implementation-Defined Pragmas. C-4
C.9.2 Implementation-Dependent Attributes. C-4
C.9.3 Package SYSTEM. C-5
C.9.4 Representation Clauses. C-5
C.9.5 Implementation-Generated Names. C-5
C.9.6 Address Clause Expression Interpretation. C-5
C.9.7 Unchecked Conversion Restrictions. C-5
C.9.8 Implementation-Dependent Characteristics of the I/O Packages. C-6
C.9.9 Compilation of Generic Units. C-6

C. LRM ANNOTATIONS

TeleGen2 for VAX/VMS to embedded MC680X0 targets compiles the full ANSI Ada language as defined by the *Reference Manual for the Ada Programming Language* (LRM) (ANSI/MIL-STD-1815A). This appendix describes the sections of the language that are designated by the LRM as implementation dependent for the compiler and run-time environment. These language-related issues are presented in the order in which they appear in the LRM. Each section answers the corresponding section of questions presented in the document *Ada-Europe Guidelines for Ada Compiler Specification and Selection* (J. Nissen and B. Wichmann, MPL Report DITC 10/82).

C.1. LRM Chapter 2

[LRM 2.1] The host and target character set is the ASCII character set.

[LRM 2.2] The maximum number of characters on an Ada source line is 200.

[LRM 2.8] TeleGen2 implements the language-defined pragmas: ELABORATE, INLINE, INTERFACE, PRIORITY, and SUPPRESS. This release of TeleGen2 does not support the following language-defined pragmas: CONTROLLED, LIST, MEMORY_SIZE, OPTIMIZE, PACK, PAGE, SHARED, STORAGE_UNIT, and SYSTEM_NAME. If included in Ada source, the pragma will have no effect.

The one implementation-defined pragma for the TeleSoft's Ada compilers, COMMENT, is used for embedding a comment into the object code. The form of the pragma is

```
pragma COMMENT ("Comment to be embedded");
```

Pragma COMMENT may appear at any location within the source code of a compilation unit except within the generic formal part of a generic unit. Any number of comments may be entered into the object code using this method.

C.2. LRM Chapter 3

[LRM 3.2.1] This release of TeleGen2 does not produce warning messages about the use of uninitialized variables. The compiler will not reject a program for this reason. In a later release, the Global Optimizer will identify uninitialized variables.

[LRM 3.5.1] The maximum number of elements in an enumeration type is 32767.

[LRM 3.5.4] There are two predefined integer types: INTEGER and LONG_INTEGER. The attributes of these types are shown in Table C-1.

Table C-1. Attributes of Predefined Types Integer and Long_Integer

Attribute	Type	
	Integer	Long_Integer
'First	-32768	-2147483648
'Last	32767	2147483647
'Size	16	32
'Width	6	11

The type Short_Integer is not implemented. Note that better object code will be produced and portability will be enhanced by using explicit integer type definitions rather than these predefined integer types.

[LRM 3.5.8] There are two predefined floating point types: FLOAT and LONG_FLOAT. The floating point types yield:

FLOAT'DIGITS = 6
LONG_FLOAT'DIGITS = 15

for the number of decimal digits in the decimal mantissa of the model numbers. These floating point facilities are based on the IEEE standard for 32-bit and 64-bit numbers. Explicit real type definitions should lead to more portable code. The type SHORT_FLOAT is not impiemented.

C.3. LRM Chapter 4

[LRM 4.10] There is no limit on the range of literal values for TeleGen2.

[LRM 4.10] There is no limit on the accuracy of real literal expressions. Real literal expressions are computed using an arbitrary precision universal arithmetic package.

C.4. LRM Chapter 9

[LRM 9.6] This implementation uses 32-bit fixed point numbers to represent the type DURATION. The attributes of the type DURATION are shown in Table C-2.

Table C-2. Attributes of Type Duration.

Attribute	Value
'Delta	2 ** (-14)
'First	-86400
'Last	86400

[LRM 9.8] Sixty-four levels of priority are available to associate with tasks through pragma PRIORITY. The predefined subtype PRIORITY is specified in the package SYSTEM as

subtype PRIORITY is INTEGER range 0..63;

Currently the priority assigned to tasks without a pragma PRIORITY specification is PRIORITY'First. Later optimizations may change this value.

[LRM 9.11] The restrictions on shared variables are only those specified in the LRM.

C.5. LRM Chapter 10

[LRM 10] All main programs are assumed to be procedures without parameters or functions with an integer result type.

[LRM 10.5] A task which was initiated in an imported library unit terminates when the parent program terminates.

C.6. LRM Chapter 11

[LRM 11.1] NUMERIC_ERROR is raised for integer or floating point overflow and for divide-by-zero situations. Floating point underflow yields a result of zero without raising an exception.

PROGRAM_ERROR and STORAGE_ERROR are raised by those situations that are specified in LRM Section 11.1.

C.7. LRM Chapter 13

Only the Chapter 13 facilities explicitly mentioned here are supported in the first release of TeleGen2.

[LRM 13.1] TeleGen2 allows user specification of storage for a task activation using the STORAGE_SIZE attribute in a length clause.

[LRM 13.5] Address clauses applied to objects and to single entries are supported. For objects, a simple expression of type Address is interpreted as a position within the linear address space of the MC680X0. Unchecked_Conversion to the private type System.Address must be used to specify address constants. For interrupt entries, the address of a TeleSoft-defined *interrupt descriptor* can be given. See Chapter 6 for details.

[LRM 13.7.1] There are no system-generated names for system-dependent components.

[LRM 13.7.3] For a predefined floating point type F, the attribute values are as follows:

Attribute	Float	Long_Float
F'MACHINE_ROUNDS	TRUE	TRUE
F'MACHINE_RADIX	2	2
F'MACHINE_MANTISSA	24	53
F'MACHINE_EMAX	128	1024
F'MACHINE_EMIN	-126	-1022
F'MACHINE_OVERFLOWS	TRUE	TRUE

[LRM 13.9] Pragma INTERFACE is supported for the language Assembly. The TeleSoft Linker can link such Assembly routines into an Ada program when they are represented in TeleSoft Object Form. Third party assemblers can be used to process the Assembly language for these routines, as long as an OMImport utility is available to convert the object modules produced by those assemblers to TeleSoft Object Form.

[LRM 13.10.1] There are no restrictions on unchecked deallocations. Instantiated versions of this procedure behave as specified in the LRM.

[LRM 13.10.2] Unchecked conversions are allowed between types (or subtypes) T1 and T2 provided that 1) they have the same static size, 2) they are not unconstrained array types, and 3) they are not private (unless they are subtypes of or are derived from type SYSTEM.ADDRESS).

C.8. LRM Appendix A

There are no implementation-defined attributes in the TeleGen2 compiler.

C.9. LRM Appendix F

The Ada language definition allows for certain target dependencies in a controlled manner. This appendix, called Appendix F as prescribed in the LRM, describes implementation-dependent characteristics of TeleGen2 for VAX/VMS to embedded MC680X0 targets.

C.9.1. Implementation-Defined Pragmas. There is one implementation-defined pragma, pragma COMMENT. This pragma is used for embedding a sequence of characters into the object code. The syntax is:

```
pragma COMMENT( <string_literal> );
```

where:

<string_literal> represents the characters to be embedded in the object code.

Pragma COMMENT may appear at any location within the source code of a compilation unit except within the generic formal part of a generic unit. Any number of comments may be entered into the object code using this method.

C.9.2. Implementation-Dependent Attributes. There are no implementation-dependent attributes.

C.9.3. Package SYSTEM.

The current specification of the package is provided below. Note that the named number Tick is not used by any component of the TeleGen2 compiler or run-time system. Similarly, Memory_Size is not used.

```
package SYSTEM is

   type ADDRESS is access INTEGER;

   type NAME is (TeleGen2);

   SYSTEM_NAME  : constant NAME := TeleGen2;

   STORAGE_UNIT : constant := 8;
   MEMORY_SIZE  : constant := (2 ** 31) - 1;

       -- System-Dependent Named Numbers:

   MIN_INT      : constant := -(2 ** 31);
   MAX_INT      : constant := (2 ** 31) - 1;
   MAX_DIGITS   : constant := 15;
   MAX_MANTISSA : constant := 31;
   FINE_DELTA   : constant := 1.0 / (2 ** (MAX_MANTISSA - 1));
   TICK         : constant := 10.0E-3;

       -- Other System-Dependent Declarations:

   subtype PRIORITY is INTEGER range 0 .. 63;

       -- Other TeleSoft Declarations:

   type SUBPROGRAM_VALUE is private;

private
   -- ...

end SYSTEM;
```

C.9.4. **Representation Clauses.** The TeleGen2 supports the following representation clause:

- Address Clauses: for objects and entries [LRM 13.5]
- Length Clauses: specifying storage for a task at activation [LRM 13.1]

C.9.5. Implementation-Generated Names. There are no implementation-generated names denoting implementation-dependent components.

C.9.6. Address Clause Expression Interpretation. Expressions that appear in Address specifications are interpreted as the address of the first storage unit of the object.

C.9.7. Unchecked Conversion Restrictions. Unchecked conversions are allowed between types (or subtypes) T1 and T2 provided that 1) they have the same static size, 2) they are not unconstrained array types, and 3) they are not private (unless they are subtypes of or are derived

from type SYSTEM.ADDRESS).

C.9.8. Implementation-Dependent Characteristics of the I/O Packages.

1. Only I/O to a system console is supported in Text_IO.
2. Direct_IO and Sequential_IO are not supported.
3. In Text_IO, the type Count is defined as follows:

```
type Count is range 0..32767;
```

4. In Text_IO, the type Field is defined as follows:

```
subtype Field is integer range 0..1000;
```

5. The standard library contains preinstantiated versions of Text_IO.Integer_IO for type Integer and Long_Integer and of Text_IO.Float_IO for type Float and Long_Float. It is suggested that the following be used to eliminate multiple instantiations of these packages:

```
Integer_Text_IO
Long_Integer_Text_IO
Float_Text_IO
Long_Float_Text_IO
```

C.9.9. Compilation of Generic Units. The declaration and body of a generic unit must be submitted as a single compilation (i.e., must be in the same source file).

APPENDIX C

TEST PARAMETERS

$MAX_IN_LEN	200
$BIG_ID1	String(1..200) := (1..199 => 'A', 200 => '1')
$BIG_ID2	String(1..200) := (1..199 => 'A', 200 => '2')
$BIG_ID3	String(1..200) := (1..100 => 'A', 101 => '3', 102..200 => 'A')
$BIG_ID4	String(1..200) := (1..100 => 'A', 101 => '4', 102..200 => 'A')
$NEG_BASED_INT	16#FFFFFFFE#
$BIG_INT_LIT	String(1..200) := (1..197 => '0', 198..200 => "298")
$BIG_REAL_LIT	String(1..200) := (1..194 => '0', 195..200 => "69.0E1")
$EXTENDED_ASCII_CHARS	"abcdefghijklmnopqrstuvwx yz!$%?@[\]^`{}~"
$NON_ASCII_CHAR_TYPE	(NON_NULL)
$BLANKS	String(1..180) := (1..180 => ' ')
$MAX_DIGITS	15
$NAME	No such numeric type - long integer used
$INTEGER_FIRST	-2**31;
$INTEGER_LAST	2**31-1;
$MAX_INT	2**31-1;
$LESS_THAN_DURATION	-86_401.0
$GREATER_THAN_DURATION	86_401.0
$LESS_THAN_DURATION_BASE_FIRST	-131_072.0
$GREATER_THAN_DURATION_BASE_LAST	131_072.0
$COUNT_LAST	2147483645
$FIELD_LAST	1000
$FILE_NAME_WITH_BAD_CHARS	"X)]%!@#$^&~Y"
$FILE_NAME_WITH_WILD_CARD_CHAR	"XYZ**"
$ILLEGAL_EXTERNAL_FILE_NAME1	"BAD-CHARACTER*^/%"
$ILLEGAL_EXTERNAL_FILE_NAME2	String(1..120) := (1..120 => 'A');

APPENDIX D

WITHDRAWN TESTS

Some tests are withdrawn from the ACVC because they do not conform to the Ada Standard. The following 19 tests had been withdrawn at the time of validation testing for the reasons indicated. A reference of the form "AI-ddddd" is to an Ada Commentary.

- C32114A: An unterminated string literal occurs at line 62.
- B33203C: The reserved word "IS" is misspelled at line 45.
- C34018A: The call of function G at line 114 is ambiguous in the presence of implicit conversions.
- C35904A: The eleboration of subtype declarations SFX3 and SFX4 may raise NUMERIC_ERROR instead of CONSTRAINT_ERROR as expected in the test.
- B37401A: The object declarations at lines 126 through 135 follow subprogram bodies declared in the same declarative part.
- C41404A: The values of 'LAST and 'LENGTH are incorrect in the if statements from line 74 to the end of the test.
- B45116A: ARRPRIBL1 and ARRPRIBL2 are initialized with a value of the wrong type--PRIBOOL_TYPE instead of ARRPRIBOOL_TYPE--at line 41.
- C48008A: the assumption that evaluation of default initial values occurs when an exception is raised by an allocator is incorrect according to AI-00397.
- B49006A: Object declarations at lines 41 and 50 are terminated incorrectly with colons, and end case; is missing from line 42.
- B4A010C: The object declaration in line 18 follows a subprogram body of the same declarative part.
- B74101B: The begin at line 9 causes a declarative part to be treated as a sequence of statements.

- C87B50A: The call of "/=" at line 31 requires a use clause for package A.
- C92005A: The "/=" for type PACK.BIG_INT at line 40 is not visible without a use clause for the package PACK.
- C940ACA: The assumption that allocated task TT1 will run prior to the main program, and thus assign SPYNUMB the value checked for by the main program, is erroneous.
- CA3005A..D (4 tests): No valid elaboration order exists for these tests.
- BC3204C: The body of BC3204C0 is missing.

APPENDIX E

SUBSET LIST

CZ1101A.ADA	CZ1102A.ADA	CZ1103A.ADA
CZ1201A.ADA	CZ1201B.ADA	CZ1201C.ADA
CZ1201D.ADA	B22001E.TST	B22001M.TST
B22004C.ADA	C23003A.TST	B23003F.TST
C23003I.TST	C23006E.ADA	C24003B.TST
E24101A.TST	C24202A.ADA	A26004A.TST
A29002E.ADA	C32107B.ADA	B33201D.ADA
C34001H.ADA	C35104A.ADA	C35711A.ADA
B36171H.ADA	C36205K.ADA	C37012A.ADA
B37301G.ADA	B38001D.ADA	E38104A.ADA
B38105A.ADA	C41105A.ADA	C41204A.ADA
C41303C.ADA	C41306C.ADA	C42006A.ADA
C43107A.ADA	C43205D.ADA	C43208A.ADA
E43211B.ADA	E43212B.ADA	C43212C.ADA
C45101I.ADA	C45123B.ADA	B45206B.ADA
B45208G.ADA	C45220B.ADA	C45264B.ADA
C45274C.ADA	C45342A.ADA	C45401A.ADA
C45505A.ADA	B45522A.ADA	C45526A.ADA
C45672A.ADA	B48002E.ADA	C48004A.ADA
C48007B.ADA	C48009C.ADA	C48010A.ADA
D4A002A.ADA	C4A005A.ADA	C4A011A.ADA
C4A014A.ADA	C51004A.ADA	C52001B.ADA
C52005D.ADA	C52102A.ADA	C52103P.ADA
E52103Y.ADA	C52104B.ADA	C53005A.ADA
C54A03A.ADA	C54A24A.ADA	C54A42A.ADA
A54B01A.ADA	D55A03B.ADA	A55B12A.ADA
C55C02B.ADA	D56001B.ADA	C57003A.ADA
B58003B.ADA	C58006A.ADA	B59001I.ADA
C59002B.ADA	B61001N.ADA	A62006D.ADA
B63009B.ADA	C64005C.ADA	C64103A.ADA
C64104L.ADA	C64105E.ADA	C64109E.ADA
E66001D.ADA	C66002F.ADA	C67005A.ADA
A71002A.ADA	A73001J.ADA	A74106A.ADA
C74305A.ADA	C74409B.ADA	A83C01F.ADA
C83F03A.ADA	A85013B.ADA	C86001E.ADA
C87A05B.ADA	C87B11B.ADA	C87B30A.ADA
C87B42A.ADA	B91001E.ADA	C910BDB.ADA
C93005F.ADA	E94004A.ADA	E94004B.ADA
E94004C.ADA	C94007A.ADA	B95006C.ADA
B95031A.ADA	C95065B.ADA	C95076A.ADA
C95087A.ADA	C96005A.ADA	B97108B.ADA

C97304A.ADA	EA1003B.ADA	CA1008A0.ADA
CA1008A1M.ADA	CA1012B0.ADA	CA1012B2.ADA
CA1012B4M.ADA	LA5001A0.ADA	LA5001A1.ADA
LA5001A2.ADA	LA5001A3.ADA	LA5001A4.ADA
LA5001A5.ADA	LA5001A6.ADA	LA5001A7M.ADA
CA5002A.ADA	CA5003B0.ADA	CA5003B1.ADA
CA5003B2.ADA	CA5003B3.ADA	CA5003B4.ADA
CA5003B5M.ADA	CA5004B.ADA	LA5007M0.ADA
LA5007M1.ADA	LA5007M2.ADA	LA5007M3M.ADA
LA5007S0.ADA	LA5007S1.ADA	LA5007S2M.ADA
LA5007S3.ADA	LA5008C0.ADA	LA5008C1M.ADA
LA5008W0.ADA	LA5008W1.ADA	LA5008W2.ADA
LA5008W3.ADA	LA5008W4M.ADA	LA5008W5.ADA
CB1002A.ADA	CB2006A.ADA	CB3004A.ADA
CB4006A.ADA	CB5001B.ADA	CC2002A.ADA
CC3011D.ADA	CC3120B.ADA	CC3208B.ADA
CC3407A.ADA	CC3504C.ADA	AE2101A.ADA
AE2101F.ADA	CE2102I.ADA	CE2102J.ADA

APPENDIX F

SAMPLE SCRIPT

```
$|-----------------------------------------------------------------------
$|
$| Validation of the TeleSOFT Cross-Compilation System
$|
$|
$| Sample VMS/DCL script for compiling, binding, linking and downloading a
$| test program in the cross compiler validation environment.
$|
$| This is a model of the basic steps taken. A more elaborate set of scripts
$| were used for the actual validation runs to provide an automated test
$| driver.
$|
$| In this example C12345A.ADA is used as test program name. This nonexistant
$| test thus contains the main compilation unit "Procedure C12345A".
$|
$| All steps in this script are done for a class A, C, D or E test.
$| For class D tests binding, linking and downloading are unnecessary.
$| For class L tests downloading is performed if an executable file is produced.
$|
$|-----------------------------------------------------------------------
$
$|-----------------------------------------------------------------------
$| Initialize variables
$|
$| testname = name of test source file
$| mainname = name of main compilation unit
$| b_test   = TRUE if test is a class B test, FALSE otherwise
$| port     = name of terminal port to use for host/target communication
$|-----------------------------------------------------------------------
$
$       testname = "C12345A.ADA"
$       mainname = "C12345A"
$       b_test = FALSE
$       DEFINE port TXA3:
$
$
$|-----------------------------------------------------------------------
$| Create an Ada library, i.e. in TeleSOFT Ada terminology a list of Ada
$| sublibraries. The list contains entries for the working sublibrary, any
$| environment-specific libraries and the Ada runtime library.
$|-----------------------------------------------------------------------
$
$       CREATE liblst.alb
        name: worklib
        name: env_dir:68010env
        name: tsada.dir:cgs68010
        name: tsada$dir:ts=68rtl
$
```

```
$
$|-------------------------------------------------------------------------------
$| Create the actual working sublibrary
$|-------------------------------------------------------------------------------
$
$       TSADA /CREATE /ESD worklib
$
$
$|-------------------------------------------------------------------------------
$| Choose compilation command depending on test type. If the test is a B test
$| a compilation listing must be supplied.
$|-------------------------------------------------------------------------------
$
$       IF b_test THEN -
          compile_command = "TSADA /ESB /PROCEED /MONITOR /VIRT=3000 /LIST"
$
$       IF .NOT. b_test THEN -
          compile_command = "TSADA /ESB /PROCEED /MONITOR /VIRT=3000"
$
$
$|-------------------------------------------------------------------------------
$| Compile the test program
$|-------------------------------------------------------------------------------
$
$       'compile_command' 'testname'
$
$
$|-------------------------------------------------------------------------------
$| Bind the main procedure. This step produces the actual main program and a
$| command file for the linking.
$|-------------------------------------------------------------------------------
$
$       TSADA /BIND 'mainname'
$
$
$|-------------------------------------------------------------------------------
$| Link the main procedure. This step produces a file suitable for downloading
$| to the target computer. The options file contains target specific information
$| e.g. how to divide memory in the target into code areas, heap and different
$| stacks.
$|-------------------------------------------------------------------------------
$
$       TSADA   /LINK -
                /OPTIONS = 68010_lnk.opt -
                /LOAD_MODULE = 'testname'.EF -
          'mainname'
$
$
```

```
$|-------------------------------------------------------------------------
$| Download to the target. The target is in a ready-state, starts receiving the
$| code and boots the program when the downloading is finished. The test
$| results are written to the typeahead buffer on the host computer using the
$| same line that were used for downloading.
$|-------------------------------------------------------------------------
$
$       TSADA   /DOWNLOAD -
                /LINE = port -
                /BOOTS -
                /BOOT -
          'mainname'.EF
$
$
$|-------------------------------------------------------------------------
$| Copy the test results from the typeahead buffer into a results data file.
$| In this example the file will be named C123456.RES
$|-------------------------------------------------------------------------
$
$       COPY port 'mainname'.RES
$
$
$|-------------------------------------------------------------------------
$| Present the result by typing the data file.
$|-------------------------------------------------------------------------
$
$       TYPE 'mainname'.RES
$
$
$|-------------------------------------------------------------------------
$| The target computer is now ready for the next test, waiting as a download
$| receiver again.
$|-------------------------------------------------------------------------
$
$
```

APPENDIX G

CONFIGURATION DIAGRAM

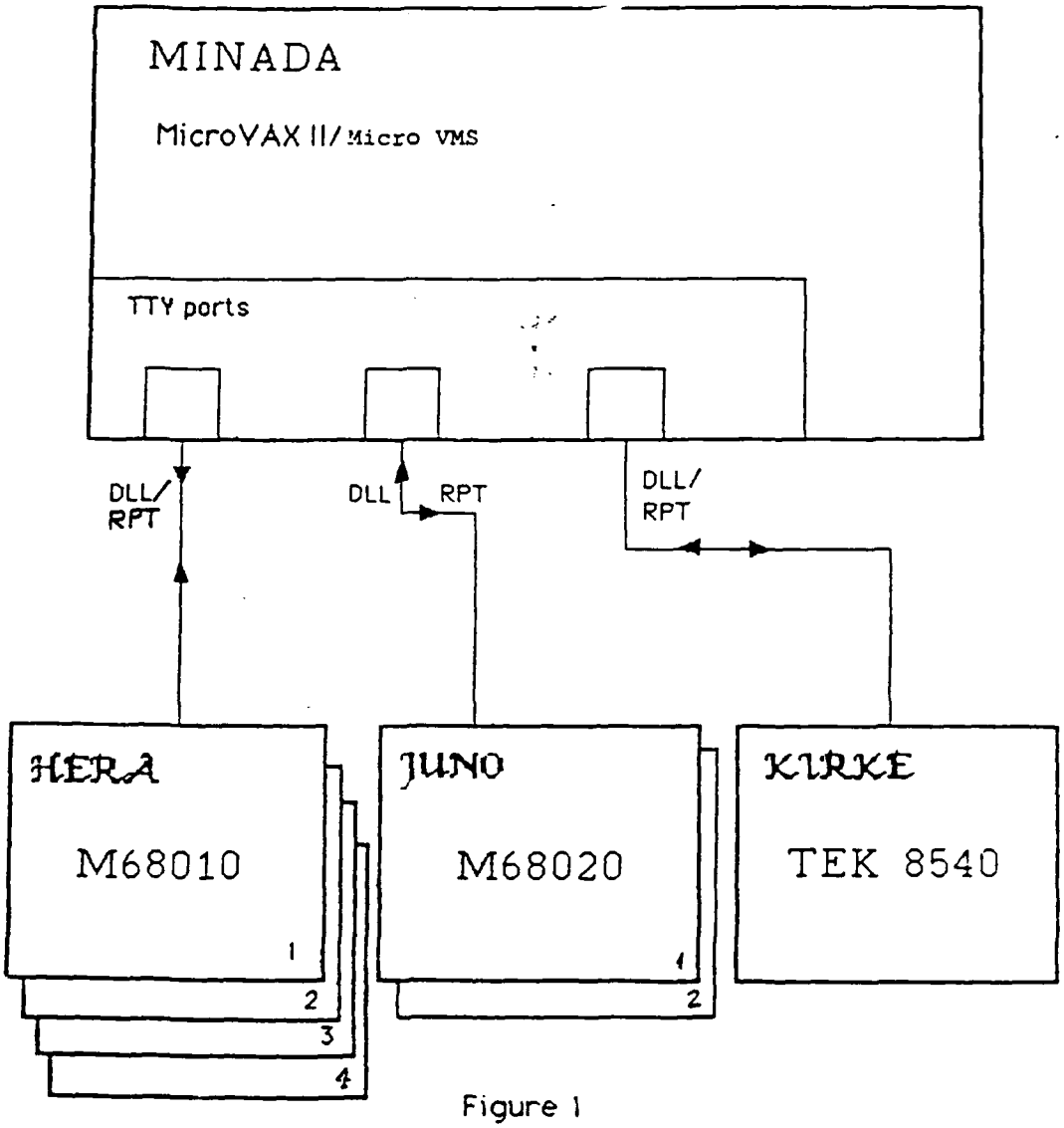


Figure 1
Host-Target Communication Configuration
for Cross-Validation

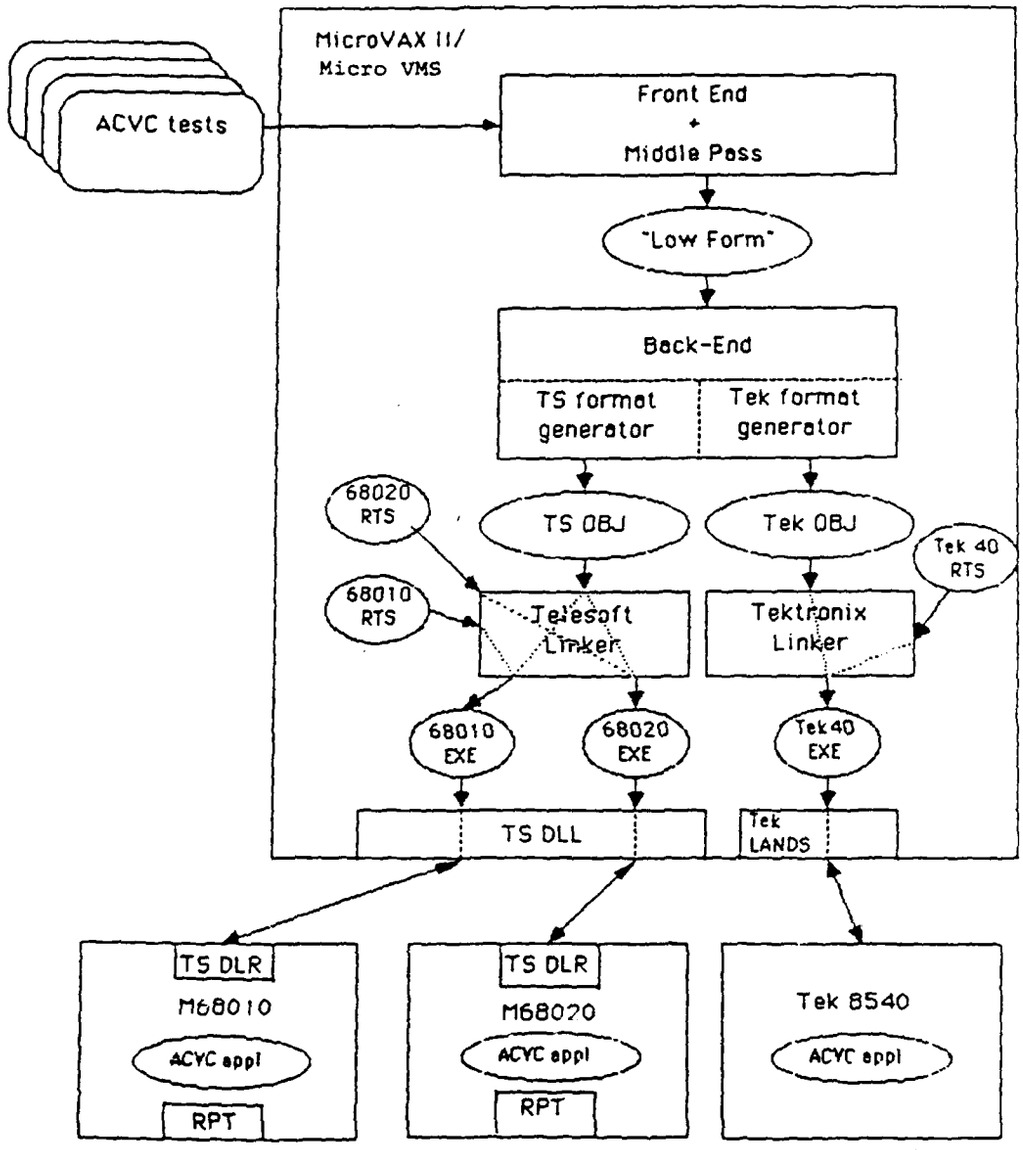


Figure 2
Development System Configuration