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Rational Environment, Version D_11_0_8

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VMS 4.7

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This report has been reviewed and is approved.

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APPENDIX C TEST PARAMETERS

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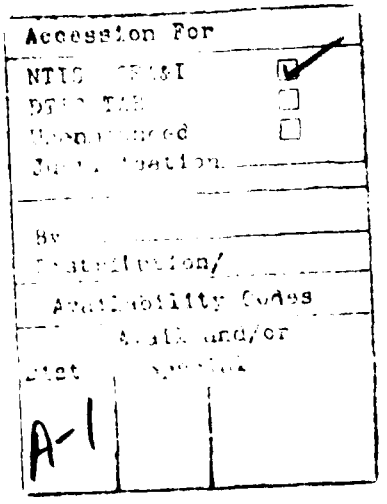

CHAPTER 1

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 Ada 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 the characteristics of particular operating systems, hardware, or implementation strategies. All 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 is 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.

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 attempt to identify any language constructs supported by the compiler that do not conform to the Ada Standard
- To attempt to identify any language constructs not supported by the compiler but 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 SofTech, Inc. under the direction of the AVF according to procedures established by the Ada Joint Program Office and administered by the Ada Validation Organization (AVO). On-site testing was completed 12 July 1989 at Santa Clara CA.

1.2 USE OF THIS VALIDATION SUMMARY REPORT

Consistent with the national laws of the originating country, the AVO may make fuion Act" (5
U.S.C.#552). 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 all statements set forth in this report are accurate and complete, or that the subject compiler has no nonconformities 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:

Ada Validation Facility
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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
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1.3 REFERENCES

1. Reference Manual for the Ada Programming Language, ANSI/MIL-STD-1815A, February 1983 and ISO 8652-1987.

2. Ada Compiler Validation Procedures and Guidelines, Ada Joint Program Office, 1 January 1987.

3. Ada Compiler Validation Capability Implementers' Guide, SofTech, Inc., December 1986.

4. Ada Compiler Validation Capability User's Guide, December 1986.

1.4 DEFINITION OF TERMS

ACVC	The Ada Compiler Validation Capability. The set of Ada programs that tests the conformity of an Ada compiler to the Ada programming language.
Ada Commentary	An Ada Commentary contains all information relevant to the point addressed by a comment on the Ada Standard. These comments are given a unique identification number having the form AI-ddddd.
Ada Standard	ANSI/MIL-STD-1815A, February 1983 and ISO 8652-1987.
Applicant	The agency requesting validation.
AVF	The Ada Validation Facility. The AVF is responsible for conducting compiler validations according to procedures contained in the Ada Compiler Validation Procedures and Guidelines.
AVO	The Ada Validation Organization. The AVO has oversight authority over all AVF practices for the purpose of maintaining a uniform process for validation of Ada compilers. The AVO provides administrative and technical support for Ada validations to ensure consistent practices.
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 — An ACVC test for which the compiler generates a result that demonstrates nonconformity to the Ada Standard.

Host — The computer on which the compiler resides.

Inapplicable test — An ACVC 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 — An ACVC 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 a combination of 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 — An ACVC test found to be incorrect and not used to check conformity to the Ada Standard. 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 compilation or link errors because of the way in which a program library is used at link time.

Class A tests ensure the successful compilation of legal Ada programs with certain language constructs which cannot be verified at compile time. There are no explicit program components in a Class A test to check semantics. 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 the run time system to ensure 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.

Class E tests are expected to execute successfully and check implementation-dependent options and resolutions of ambiguities in the Ada Standard. 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 produce 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. In some cases, an implementation may legitimately detect errors during compilation of the test.

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 REPORT and CHECK_FILE 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 each test in the ACVC follows 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 is provided 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. The applicability of a test to an implementation is considered each time the implementation is validated. A test that is inapplicable for one validation is not necessarily inapplicable for a subsequent validation. 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 this 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:

Compiler: VAX/VMS Cross Development Facility, Version 5

ACVC Version: 1.10

Certificate Number: 890712W1.10114

Host Computer:

Machine:	R1000 Series 200 Model 20
Operating System:	Rational Environment Version D_11_0_8
Memory Size:	32 MB

Target Computer:

Machine:	DEC Vaxstation II
Operating System:	VMS 4.7
Memory Size:	13 MB

CONFIGURATION INFORMATION

Communications Network: Ethernet

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. The tests demonstrate the following characteristics:

a. Capacities.

(1) The compiler correctly processes a compilation containing 723 variables in the same declarative part. (See test D29002K.)

(2) The compiler correctly processes tests containing loop statements nested to 65 levels. (See tests D55A03A..H (8 tests).)

(3) The compiler correctly processes tests containing block statements nested to 65 levels. (See test D56001B.)

(4) The compiler correctly processes tests containing recursive procedures separately compiled as subunits nested to 10 levels. (See tests D64005E..G (3 tests).)

b. Predefined types.

(1) This implementation supports the additional predefined types SHORT_INTEGER, LONG_FLOAT, and SHORT_SHORT_INTEGER in package STANDARD. (See tests B86001T..Z (7 tests).)

c. Expression evaluation.

The order in which expressions are evaluated and the time at which constraints are checked are not defined by the language. While the ACVC tests do not specifically attempt to determine the order of evaluation of expressions, test results indicate the following:

(1) None of the default initialization expressions for record components are evaluated before any value is checked for membership in a component's subtype. (See test C32117A.)

(2) Assignments for subtypes are performed with the same precision as the base type. (See test C35712B.)

(3) This implementation uses no extra bits for extra precision and uses all extra bits for extra range. (See test C35903A.)

(4) Sometimes NUMERIC_ERROR is raised when an integer literal operand in a comparison or membership test is outside the range of the base type. (See test C45232A.)

(5) NUMERIC_ERROR is raised when a literal operand in a fixed-point comparison or membership test is outside the range of the base type. (See test C45252A.)

(6) Underflow is not gradual. (See tests C45524A..Z.)

d. Rounding.

The method by which values are rounded in type conversions is not defined by the language. While the ACVC tests do not specifically attempt to determine the method of rounding, the test results indicate the following:

(1) The method used for rounding to integer is round away from zero. (See tests C46012A..Z.)

(2) The method used for rounding to longest integer is round away from zero. (See tests C46012A..Z.)

(3) The method used for rounding to integer in static universal real expressions is round away from zero. (See test C4A014A.)

e. 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.

For this implementation:

(1) Declaration of an array type or subtype declaration with more than SYSTEM.MAX_INT components raises NUMERIC_ERROR. (See test C36003A.)

(2) NUMERIC_ERROR is raised when a null array type with INTEGER'LAST + 2 components is declared. (See test C36202A.)

(3) NUMERIC_ERROR is raised when a null array type with SYSTEM.MAX_INT + 2 components is declared. (See test C36202B.)

(4) A packed BOOLEAN array having a 'LENGTH exceeding INTEGER'LAST raises NUMERIC_ERROR when the array type is declared. (See test C52103X.)

(5) A packed two-dimensional BOOLEAN array with more than INTEGER'LAST components raises NUMERIC_ERROR when the array type is declared. (See test C52104Y.)

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

(7) In assigning one-dimensional array types, the expression is 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.)

(8) In assigning two-dimensional array types, the expression is not 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.)

f. Discriminated types.

(1) In assigning record types with discriminants, the expression is 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.)

g. Aggregates.

(1) In the evaluation of a multi-dimensional aggregate, all choices are evaluated before checking against the index type. (See tests C43207A and C43207B.)

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

(3) CONSTRAINT_ERROR is raised before all choices are evaluated when a bound in a non-null range of a non-null aggregate does not belong to an index subtype. (See test E43211B.)

h. Pragmas.

(1) The pragma INLINE is supported for functions and procedures. (See tests LA3004A..B, EA3004C..D, and CA3004E..F.)

i. Generics

(1) Generic specifications and bodies can be compiled in separate compilations. (See tests CA1012A, CA2009C, CA2009F, BC3204C, and BC3205D.)

(2) Generic unit bodies and their subunits can be compiled in separate compilations. (See test CA3011A.)

j. Input and output

(1) The package SEQUENTIAL_IO can be instantiated with unconstrained array types and record types with discriminants without defaults. (See tests AE2101C, EE2201D, and EE2201E.)

(2) The package DIRECT_IO cannot be instantiated with unconstrained array types or record types with discriminants without defaults. (See tests AE2101H, EE2401D, and EE2401G.)

(3) Create with mode OUT_FILE and open with modes IN_FILE and OUT_FILE is supported, but create with mode IN_FILE is not supported for SEQUENTIAL_IO. (See tests CE2102D..E, CE2102N, and CE2102P.)

(4) Create with modes OUT_FILE and INOUT_FILE is supported for DIRECT_IO. Open with modes IN_FILE, OUT_FILE, and INOUT_FILE is supported for DIRECT_IO. (See tests CE2102F, CE2102I..J, CE2102R, CE2102T, and CE2102V.)

(5) Create with mode OUT_FILE and open with modes IN_FILE and OUT_FILE is supported, but create with mode IN_FILE is not supported for text files. (See tests CE3102E and CE3102I..K.)

(6) RESET and DELETE operations are supported for SEQUENTIAL_IO. (See tests CE2102G and CE2102X.)

(7) RESET and DELETE operations are supported for DIRECT_IO. (See tests CE2102K and CE2102Y.)

(8) RESET and DELETE operations are supported for text files. (See tests CE3102F..G, CE3104C, CE3110A, and CE3114A.)

(9) Overwriting to a sequential file truncates to the last element written. (See test CE2208B.)

(10) Temporary sequential files are given names and deleted when closed. (See test CE2108A.)

(11) Temporary direct files are given names and deleted when closed. (See test CE2108C.)

(12) Temporary text files are given names and deleted when closed. (See test CE3112A.)

(13) More than one internal file can be associated with each external file for sequential files when reading only. (See tests CE2107A..E, CE2102L, CE2110B, and CE2111D.)

(14) More than one internal file can be associated with each external file for direct files when reading only. (See tests CE2107F..H (3 tests), CE2110D, and CE2111H.)

(15) More than one internal file can be associated with each external file for text files when reading only. (See tests CE3111A..E, CE3114B, and CE3115A.)

CHAPTER 3

TEST INFORMATION

3.1 TEST RESULTS

Version 1.10 of the ACVC comprises 3717 tests. When this compiler was tested, 44 tests had been withdrawn because of test errors. The AVF determined that 460 tests were inapplicable to this implementation. All inapplicable tests were processed during validation testing except for 285 executable tests that use floating-point precision exceeding that supported by the implementation . Modifications to the code, processing, or grading for 75 tests were required to successfully demonstrate the test objective. (See section 3.6.)

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	128	1132	1866	15	26	46	3213
Inapplicable	1	6	449	2	2	0	460
Withdrawn	1	2	35	0	6	0	44
TOTAL	130	1140	2350	17	34	46	3717

3.3 SUMMARY OF TEST RESULTS BY CHAPTER

RESULT	CHAPTER													TOTAL
	2	3	4	5	6	7	8	9	10	11	12	13	14	
Passed	192	547	495	245	171	99	162	331	137	36	252	265	281	3213
Inappl	20	102	185	3	1	0	4	1	0	0	0	104	40	460
Wdrn	1	1	0	0	0	0	0	2	0	0	1	35	4	44
TOTAL	213	650	680	248	172	99	166	334	137	36	253	404	325	3717

3.4 WITHDRAWN TESTS

The following 44 tests were withdrawn from ACVC Version 1.10 at the time of this validation:

E28005C	A39005G	B97102E	C97116A	BC3009B	CD2A62D
CD2A63A	CD2A63B	CD2A63C	CD2A63D	CD2A66A	CD2A66B
CD2A66C	CD2A66D	CD2A73A	CD2A73B	CD2A73C	CD2A73D
CD2A76A	CD2A76B	CD2A76C	CD2A76D	CD2A81G	CD2A83G
CD2A84M	CD2A84N	CD2B15C	CD2D11B	CD5007B	CD50110
ED7004B	ED7005C	ED7005D	ED7006C	ED7006D	CD7105A
CD7203B	CD7204B	CD7205C	CD7205D	CE2107I	CE3111C
CE3301A	CE3411B				

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. The applicability of a test to an implementation is considered each time a validation is attempted. A test that is inapplicable for one validation attempt is not necessarily inapplicable for a subsequent attempt. For this validation attempt, 460 tests were inapplicable for the reasons indicated:

a. The following 285 tests are not applicable because they have floating-point type declarations requiring more digits than SYSTEM.MAX_DIGITS:

C24113F..Y	C35705F..Y	C35706F..Y	C35707F..Y
C35708F..Y	C35802F..Z	C45241F..Y	C45321F..Y
C45421F..Y	C45521F..Z	C45524F..Z	C45621F..Z

C45641F..Y C46012F..Z

b. C35702A and B86001T are not applicable because this implementation supports no predefined type SHORT_FLOAT.

c. The following 16 tests are not applicable because this implementation does not support a predefined type LONG_INTEGER:

C45231C	C45304C	C45502C	C45503C	C45504C
C45504F	C45611C	C45613C	C45614C	C45631C
C45632C	B52004D	C55B07A	B55B09C	B86001W
CD7101F				

d. C45531M..P (4 tests) and C45532M..P (4 tests) are not applicable because the value of SYSTEM.MAX_MANTISSA is less than 47.

e. C4A013B is not applicable because the evaluation of an expression involving 'MACHINE_RADIX applied to the most precise floating-point type would raise an exception; since the expression must be static, it is rejected at compile time.

f. D4A004B is not applicable because this implementation does not support a static universal expression with a value that lies outside of the range SYSTEM.MIN_INT ... SYSTEM.MAX_INT.

g. D64005G is not applicable because this implementation does not support nesting 17 levels of recursive procedure calls.

h. B86001Y is not applicable because this implementation supports no predefined fixed-point type other than DURATION.

i. B86001Z is not applicable because this implementation supports no predefined floating-point type with a name other than FLOAT, LONG_FLOAT, or SHORT_FLOAT.

j. C96005B is not applicable because there are no values of type DURATION'BASE that are outside the range of DURATION.

k. CD1009C, CD2A41A..B (2 tests), CD2A41E, and CD2A42A..J (10 tests) are not applicable because this implementation does not support size clauses for floating point types unless the size given is the same as would have been chosen by the compiler.

l. CD2A61I and CD2A61J are not applicable because this implementation does not support size clauses for array types, which imply compression, with component types of composite or floating point types. This implementation requires an explicit size clause on the component type.

m. CD2A84B..I (8 tests) and CD2A84K..L (2 tests) are not applicable because this implementation does not support size clauses for access types unless the size given is 32.

n. CD2B15B is not applicable because this implementation allocates more memory to collection size than is asked for by the test.

o. The following 76 tests are not applicable because, for this implementation, address clauses are not supported:

CD5003B..I (8)	CD5011A..I (9)	CD5011K..N (4)
CD5011Q..S (3)	CD5012A..J (10)	CD5012L..M (2)
CD5013A..I (9)	CD5013K..O (5)	CD5013R..S (2)
CD5014A..O (15)	CD5014R..Z (9)	

p. AE2101H, EE2401D, and EE2401G use instantiations of package DIRECT_IO with unconstrained array types and record types with discriminants without defaults. These instantiations are rejected by this compiler.

q. CE2102E is inapplicable because this implementation supports CREATE with OUT_FILE mode for SEQUENTIAL_IO.

r. CE2102F is inapplicable because this implementation supports CREATE with INOUT_FILE mode for DIRECT_IO.

s. CE2102J is inapplicable because this implementation supports CREATE with OUT_FILE mode for DIRECT_IO.

t. CE2102N is inapplicable because this implementation supports OPEN with IN_FILE mode for SEQUENTIAL_IO.

u. CE2102O is inapplicable because this implementation supports RESET with IN_FILE mode for SEQUENTIAL_IO.

v. CE2102P is inapplicable because this implementation supports OPEN with OUT_FILE mode for SEQUENTIAL_IO.

w. CE2102Q is inapplicable because this implementation supports RESET with OUT_FILE mode for SEQUENTIAL_IO.

x. CE2102R is inapplicable because this implementation supports OPEN with INOUT_FILE mode for DIRECT_IO.

y. CE2102S is inapplicable because this implementation supports RESET with INOUT_FILE mode for DIRECT_IO.

z. CE2102T is inapplicable because this implementation supports OPEN with IN_FILE mode for DIRECT_IO.

aa. CE2102U is inapplicable because this implementation supports RESET with IN_FILE mode for DIRECT_IO.

ab. CE2102V is inapplicable because this implementation supports OPEN with OUT_FILE mode for DIRECT_IO.

ac. CE2102W is inapplicable because this implementation supports RESET

with OUT_FILE mode for DIRECT_IO.

ad. CE2105A is inapplicable because CREATE with mode IN_FILE is not supported by this implementation for SEQUENTIAL_IO.

ae. CE2105B is inapplicable because CREATE with IN_FILE mode is not supported for direct access files.

af. CE2107B..E (4 tests), CE2107L, CE2110B, and CE2111D are not applicable because multiple internal files cannot be associated with the same external file when one or more files is writing for sequential files. The proper exception is raised when multiple access is attempted.

ag. CE2107G..H (2 tests), CE2110D, and CE2111H are not applicable because multiple internal files cannot be associated with the same external file when one or more files is writing for direct files. The proper exception is raised when multiple access is attempted.

ah. CE3109A is inapplicable because text file CREATE with IN_FILE mode is not supported.

ai. CE3102F is inapplicable because this implementation supports RESET for text files.

aj. CE3102G is inapplicable because this implementation supports deletion of an external file for text files.

ak. CE3102I is inapplicable because this implementation supports CREATE with OUT_FILE mode for text files.

al. CE3102J is inapplicable because this implementation supports OPEN with IN_FILE mode for text files.

am. CE3102K is inapplicable because this implementation supports OPEN with OUT_FILE mode for text files.

an. CE3111B, CE3111D..E (2 tests), CE3114B, and CE3115A are not applicable because multiple internal files cannot be associated with the same external file when one or more files is writing for text files. The proper exception is raised when multiple access is attempted.

3.6 TEST, PROCESSING, AND EVALUATION MODIFICATIONS

It is expected that some tests will require modifications of code, processing, or evaluation in order to compensate for legitimate implementation behavior. Modifications are made by the AVF in cases where legitimate implementation behavior prevents the successful completion of an (otherwise) applicable test. Examples of such modifications include: adding a length clause to alter the default size of a collection; splitting a Class B test into subtests so that all errors are detected; and confirming that messages produced by an executable test demonstrate conforming behavior that wasn't anticipated by the test (such as raising one exception instead of another).

Modifications were required for 75 tests.

The following tests were split because syntax errors at one point resulted in the compiler not detecting other errors in the test:

B22003A	B22003B	B22004A	B22004B	B22004C	B23004A
B23004B	B24001A	B24001B	B24001C	B24005A	B24005B
B24007A	B24009A	B24204B	B24204C	B24204D	B25002B
B26001A	B26002A	B26005A	B28003A	B28003C	B29001A
B2A003B	B2A003C	B2A003D	B2A007A	B32103A	B33201B
B33202B	B33203B	B33301B	B35101A	B36002A	B36201A
B37205A	B37307B	B38003A	B38003B	B38009A	B38009B
B41201A	B41202A	B44001A	B44004B	B44004C	B45205A
B48002A	B48002D	B51001A	B51003A	B51003B	B53003A
B55A01A	B64001B	B64006A	B67001H	B74003A	B91001H
B95001C	B95003A	B95004A	B95079A	BB3005A	BC1303F
BC2001D	BC2001E	BC3003A	BC3003B	BC3005B	BC3013A
BD5008A					

C45651A required evaluation modification because the test contains an if statement with a range that excludes some allowable values and FAILED may be called. The AVO has ruled that the failure message "ABS 928.0 NOT IN CORRECT RANGE" may be ignored and the test graded as passed.

D4A004B was rejected at compile time because it contains a static universal expression with a value that lies outside of the range SYSTEM.MIN_INT ... SYSTEM.MAX_INT. The AVO has ruled this test as not applicable to this implementation.

3.7 ADDITIONAL TESTING INFORMATION

3.7.1 Prevalidation

Prior to validation, a set of test results for ACVC Version 1.10 produced by the VAX/VMS Cross Development Facility 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 the VAX/VMS Cross Development Facility using ACVC Version 1.10 was conducted on-site by a validation team from the AVF. The configuration in which the testing was performed is described by the following designations of hardware and software components:

Host computer:	R1000 Series 200 Model 20
Host operating system:	Rational Environment, Version D_11_0_8
Target computer:	DEC Vaxstation II
Target operating system:	VMS 4.7
Compiler:	VAX/VMS Cross Development Facility, Version 5

The host and target computers were linked via Ethernet.

A magnetic tape containing all tests except for withdrawn tests and tests requiring unsupported floating-point precisions was taken on-site by the validation team for processing. Tests that make use of implementation-specific values were customized before being written to the magnetic tape. Tests requiring modifications during the prevalidation testing were included in their modified form on the magnetic tape.

The contents of the magnetic tape were loaded directly onto the host computer.

After the test files were loaded to disk, the full set of tests was compiled on the R1000 Series 200 Model 20, then all executable images were transferred to the DEC Vaxstation II via Ethernet, linked, and run. Results were printed from the host computer.

The compiler was tested using command scripts provided by Rational and reviewed by the validation team. The compiler was tested using all default option settings except for the following:

OPTION	EFFECT
Create_Subprogram_Specs := False	Missing subprogram specs are not automatically created when the subprogram body is added to the program library.

Tests were compiled, linked, and executed (as appropriate) using a single host and target computer. 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.

3.7.3 Test Site

Testing was conducted at Santa Clara CA and was completed on 12 July 1989.

APPENDIX A

DECLARATION OF CONFORMANCE

Rational has submitted the following Declaration of Conformance concerning the VAX/VMS Cross Development Facility.

DECLARATION OF CONFORMANCE

Compiler Implementor: Rational
Ada Validation Facility: ASD/SCEL, Wright-Patterson AFB OH 45433-6503
Ada Compiler Validation Capability (ACVC) Version: 1.10

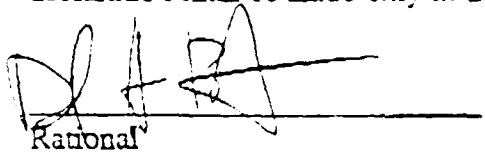
Base Configuration

Base Compiler Name: VAX/VMS Cross Development Facility Version: 5
Host Architecture: R1000 Series 200, Model 20
Operating System: Rational Environment Version D_11_0_8

Target Architecture: DEC Vaxstation II
Operating System: VMS 4.7

Implementor's Declaration

I, the undersigned, representing Rational, have implemented no deliberate extensions to the Ada Language Standard ANSI/MIL-STD-1815A in the compiler listed in this declaration. I declare that Rational is the owner of record of the Ada language compilers listed above and, as such, is responsible for maintaining said compiler in conformance to ANSI/MIL-STD-1815A. All certificates and registrations for Ada language compiler(s) listed in this declaration shall be made only in the owner's corporate name.

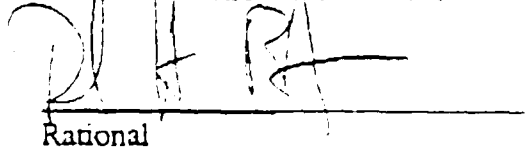


Date: 7/10/89

Rational
David H. Bernstein
Vice President, Product Development

Owners Declaration

I, the undersigned, representing Rational, take full responsibility for implementation and maintenance of the Ada compiler(s) listed above, and agree to the public disclosure of the final Validation Summary Report. I declare that all of the Ada language compilers listed, and their host/target performance are in compliance with the Ada Language Standard ANSI/MIL-STD-1815A



Date: 7/10/89

Rational
David H. Bernstein
Vice President, Product Development

APPENDIX B

APPENDIX F OF THE Ada STANDARD

The only allowed implementation dependencies correspond to implementation-dependent pragmas, to certain machine-dependent conventions as mentioned in chapter 13 of the Ada Standard, and to certain allowed restrictions on representation clauses. The implementation-dependent characteristics of the VAX/VMS Cross Development Facility, Version 5, as described in this Appendix, are provided by Rational. Unless specifically noted otherwise, references in this Appendix are to compiler documentation and not to this report. Implementation-specific portions of the package STANDARD, which are not a part of Appendix F, are:

```
package STANDARD is

   ...

   type INTEGER is range -2147483648 .. 2147483647;
   type SHORT_INTEGER is range -32768 .. 32767;
   type SHORT_SHORT_INTEGER is range -128 .. 127;

   type FLOAT is digits 6 range
     -16#1.FFFFFE# * 2.0 ** 126 .. 16#1.FFFFFE# * 2.0 ** 126;
   type LONG_FLOAT is digits 9 range
     -16#1.FFFFFFFFFFFFF# * 2.0 ** 126 .. 16#1.FFFFFFFFFFFFF# * 2.0 ** 126;

   type DURATION is delta 16#1.0# * 2.0 ** (-14) range
     -16#1.0# * 2.0 ** 17 .. 16#1.FFFFFFFC# * 2.0 ** 16;

   ...

end STANDARD;
```

Appendix F to the LRM for the Vax_Vms Target

The *Reference Manual for the Ada Programming Language* (LRM) specifies that certain features of the language are implementation-dependent. It requires that these implementation dependencies be defined in an appendix called Appendix F. This is Appendix F for the Vax_Vms target, compiler Version 5. It contains materials on the following topics listed for inclusion by the LRM on page F-1:

- Implementation-dependent pragmas
- Implementation-dependent attributes
- Package System
- Representation clauses
- Implementation-dependent components
- Interpretation of expressions that appear in address clauses
- Unchecked conversion
- Implementation-dependent characteristics of I/O Packages

These topics appear in section and subsection titles of this appendix. The appendix contains other topics mentioned in the LRM as being implementation dependent. For these, a reference to the LRM is given in the section or subsection title.

IMPLEMENTATION-DEPENDENT PRAGMAS

The VAX/VMS cross-compiler supports pragmas for application software development in addition to those listed in Annex B of the LRM. They are described below, along with additional clarifications and restrictions for pragmas defined in Annex B of the LRM.

Pragma Main

A parameterless library-unit procedure without subunits can be designated as a main program by including a pragma Main at the end of the unit specification or body. This pragma causes the linker to run and create an executable program when the body of this subprogram is coded. Before a unit having a pragma Main can be coded, all units in the *with* closure of the unit must be coded.

The pragma Main has three arguments:

- **Target**: A string specifying the target key. If this argument appears and it does not match the current target key, the pragma Main is ignored. If the Target parameter matches the current target key or does not appear, pragma Main is honored. A single source copy of a main program may be used for different targets by putting in multiple Main pragmas with different target parameters and different stack_sizes and/or different heap_sizes.
- **Stack_Size**: A static integer expression specifying the size in bytes of the main task stack. The value must lie in the range 1024 . 2**31 – 1. If not specified, the default value is 64K bytes.
- **Heap_Size**: A static integer expression specifying the size in bytes of the heap. The value must lie in the range 0 .. 2**31 – 1. If not specified the value 2**31 – 1 is used. For either specified or default values, exceeding the VAX/VMS jobs page limit will cause storage_error.

The complete syntax for this pragma is:

```
pragma_main   ::=  PRAGMA MAIN
                   [ ( main_option { , main_option } ) ] ;

main_option   ::=  TARGET => simple_name |
                   STACK_SIZE => static_integer_expression |
                   HEAP_SIZE => static_integer_expression
```

The pragma Main must appear immediately after the declaration or body of a parameterless library-unit procedure without subunits.

Pragma Nickname

The pragma Nickname can be used to give a unique string name to a procedure or function in addition to its normal Ada name. This unique name can be used to distinguish among overloaded procedures or functions in the importing and exporting pragmas defined in subsequent sections.

The pragma Nickname must appear immediately following the declaration for which it is to provide a nickname. It has a single argument, the nickname, which must be a string constant.

For example:

```
function Cat (L: Integer; R: String) return String;
pragma Nickname ("Int-Str-Cat");

function Cat (L: String; R: Integer) return String;
pragma Nickname ("Str-Int-Cat");

pragma Interface (Assembly, Cat);

pragma Import_Function (Internal => Cat,
                        Nickname => "Int-Str-Cat",
                        External => "CAT$INT_STR_CONCAT",
                        Mechanism => (Value, Reference));

pragma Import_Function (Internal => Cat,
```

```
Nickname => "Str-Int-Cat",
External => "CAT$STR_INT_CONCAT",
Mechanism => (Reference, Value));
```

Pragmas Import_ProcedureImport_Valued_Procedure and Import_Function

A subprogram written in another language (typically, assembly language) can be called from an Ada program if it is declared with a pragma Interface. The rules for placement of pragma Interface are given in Section 13.9 of the LRM. Every interfaced subprogram must have an importing pragma recognized by the VAX/VMS cross-compiler, either Import_Procedure, Import_Valued_Procedure or Import_Function. These pragmas are used to declare the external name of the subprogram and the parameter-passing mechanism for the subprogram call. If an interfaced subprogram does not have an importing pragma, or if the importing pragma is incorrect, pragma interface is ignored.

Importing pragmas can be applied only to nongeneric procedures and functions.

The pragmas Import_Procedure, Import_Valued_Procedure and Import_Function are used for importing subprograms. Import_Procedure is used to call a non-Ada procedure; Import_Function, a non-Ada function. Import_Valued_Procedure is used to a call a non-Ada function which has *out* parameters. Since out parameters are not allowed in Ada functions, the pragma has the effect of turning the function into a procedure whose first parameter is the result of the function.

Each import pragma must be preceded by a pragma Interface; otherwise, the placement rules for these pragmas are identical to those of the pragma Interface.

The importing pragmas have the form:

```
importing_pragma  ::=  PRAGMA importing_type
                       ( [ INTERNAL => ] internal_name
                         [ , [ EXTERNAL => ] external_name ]
                         [ [ , [ PARAMETER_TYPES => ]
                                                parameter_types ]
                           [ , [ RESULT_TYPE => ] type_mark ] ]
                           [ , NICKNAME => string_literal ]
                         [ , [ MECHANISM => ] mechanisms ] ) ;

importing_type    ::=  IMPORT_PROCEDURE | IMPORT_FUNCTION |
                       IMPORT_VALUED_PROCEDURE
internal_name     ::=  identifier |
                       string_literal    -- An operator designator

external_name     ::=  identifier | string_literal

parameter_types   ::=  ( NULL ) | ( type_mark { , type_mark } )

mechanisms        ::=  mechanism_name |
                       ( mechanism_name { , mechanism_name } )
```

```
mechanism_name     ::=  VALUE | REFERENCE | DESCRIPTOR(S)
```

The internal name is the Ada name of the subprogram being interfaced. If more than one subprogram is in the declarative region preceding the importing pragma, the correct subprogram must be identified by either using the argument types (and result type, if a function) or specifying the nickname.

If it is used to identify a subprogram with an overloaded internal name, the value of the Parameter_Types argument consists of a list of type or subtype names, not names of parameters. Each one corresponds positionally to a formal parameter in the subprogram's declaration. If the subprogram has no parameters, the list consists of the single word *null*. For a function, the value of the Result_Type argument is the name of the type returned by the function.

The external designator, specified with the External parameter, is a character string that is an identifier suitable for the VAX/VMS assembler. If the external designator is not specified, the internal name is used.

The Mechanism argument is required if the subprogram has any parameters. The argument specifies, in a parenthesized list, the passing mechanism for each parameter to be passed. There must be a mechanism specified for each parameter listed in **parameter_types** and they must correspond positionally. The types of mechanism are as follows.

- **Value**: Specifies that the parameter is passed on the stack by immediate value.
- **Reference**: Specifies that the parameter is passed on the stack by address. Used for structures having many values.
- **Descriptor(S)**: Specifies that the parameter is passed by VAX/VMS "S" Descriptor. This mechanism should only be used with VMS services.

For functions, it is not possible to specify the passing mechanism of the function result; the standard Ada mechanism for the given type of the function result must be used by the interfaced subprogram. If there are parameters, and they all use the same passing mechanism, then an alternate form for the Mechanism argument can be used: instead of a parenthesized list with an element for each parameter, the single mechanism name (not parenthesized) can be used instead.

Examples:

```
procedure Locate (Source: in String;
                  Target: in String;
                  Index:  out Natural);

pragma Interface (Assembler, Locate);
pragma Import_Procedure
           (Internal => Locate,
            External => "STR$LOCATE",
            Parameter_Types => (String, String, Natural),
            Mechanism => (Reference, Reference, Value));
```

```
function Pwr (I: Integer; N: Integer) return Float;
function Pwr (F: Float; N: Integer) return Float;

pragma Interface (Assembler, Pwr);

pragma Import_Function
           (Internal => Pwr,
            Parameter_Types => (Integer, Integer),
            Result_Type => Float,
            Mechanism => Value,
            External => "MATH$PWR_OF_INTEGER");
pragma Import_Function
           (Internal => Pwr,
            Parameter_Types => (Float, Integer),
            Result_Type => Float,
            Mechanism => Value,
            External => "MATH$PWR_OF_FLOAT");
```

Pragmas Export_Procedure and Export_Function

A subprogram written in Ada can be made accessible to code written in another language by using an exporting pragma defined by the VAX/VMS cross-compiler. The effect of such a pragma is to give the subprogram a defined symbolic name that the linker can use when resolving references between object modules.

Exporting pragmas can be applied only to nongeneric procedures and functions.

An exporting pragma can be given only for subprograms that are library units or that are declared in the specification of a library package. An exporting pragma can be placed after a subprogram body only if the subprogram does not have a separate specification. Thus, an exporting pragma cannot be applied to the body of a library subprogram that has a separate specification.

These pragmas have similar arguments to the importing pragmas, except that it is not possible to specify the parameter-passing mechanism. The standard Ada parameter-passing mechanisms are chosen. For descriptions of the pragma's arguments (Internal, External, Parameter_Types, Result_Type, and Nickname), see the preceding section on the importing pragmas.

The full syntax of the pragmas for exporting subprograms is:

```
exporting_pragma  ::=  PRAGMA exporting_type
                       ( [ INTERNAL => ] internal_name
                         [ , [ EXTERNAL => ] external_name ]
                         [ [ , [ PARAMETER_TYPES => ] parameter_types ]
                           [ , [ RESULT_TYPE => ] type_mark ] |
                           [ , NICKNAME => string_literal ] ] ) ;
exporting_type    ::=  EXPORT_PROCEDURE | EXPORT_FUNCTION
internal_name     ::=  identifier |
                       string_literal   -- An operator designator
external_name     ::=  identifier | string_literal
```

```
parameter_types   ::=  ( NULL ) | ( type_mark { , type_mark } )
```

Examples:

```
procedure Matrix_Multiply
              (A, B: in Matrix; C: out Matrix);

pragma Export_Procedure (Matrix_Multiply);
-- External name is the string "Matrix_Multiply"
function Sin (R: Radians) return Float;
pragma Export_Function
           (Internal => Sin,
            External => "SIN_RADIANS");
-- External name is the string "SIN_RADIANS"
```

Pragma Export_Elaboration_Procedure

The pragma Export_Elaboration_Procedure makes the elaboration procedure for a given compilation unit available to external code by defining a global symbolic name. This procedure is otherwise unnamable by the user. Its use is confined to the exceptional circumstances where an Ada module is not elaborated because it is not in the closure of the main program or if the main program is not an Ada program. This pragma is not recommended for use in application programs unless the user has a thorough understanding of elaboration, runtime and storage model considerations.

The pragma Export_Elaboration_Procedure must appear immediately following the compilation unit.

The complete syntax for this pragma is:

```
pragma_export_elaboration_procedure ::=
    PRAGMA EXPORT_ELABORATION_PROCEDURE ( EXTERNAL_NAME => external_name );

external_name ::= identifier | string_literal
```

Pragmas Import_Object and Export_Object

Objects can be imported or exported from an Ada unit with the pragmas Import_Object and Export_Object. The pragma Import_Object causes an Ada name to reference storage declared and allocated in some external (non-Ada) object module. The pragma Export_Object provides an object declared within an Ada unit with an external symbolic name that the linker can use to allow another program to access the object. It is the responsibility of the programmer to ensure that the internal structure of the object and the assumptions made by the importing code and data structures correspond. The cross-compiler cannot check for such correspondence.

The object to be imported or exported must be a variable declared at the outermost level of a library package specification or body.

The size of the object must be static. Thus, the type of the object must be one of:

- A scalar type (or subtype)
- An array subtype with static index constraints whose component size is static
- A simple record type or subtype

Objects of a private or limited private type can be imported or exported only into the package that declares the type.

Imported objects cannot have an initial value and thus cannot be:

- A constant
- An access type
- A task type
- A record type with discriminants, with components having default initial expressions, or with components that are access types or task types

In addition, the object must not be in a generic unit. The external name specified must be suitable as an identifier in the assembler.

The full syntax for the pragmas Import_Object and Export_Object is:

```
object_pragma  ::=  PRAGMA object_pragma_type
                        ( [ INTERNAL => ] identifier
                          [ , [ EXTERNAL => ] string_literal ] ) ;

object_pragma_type  ::=  IMPORT_OBJECT | EXPORT_OBJECT
```

Pragma Suppress_All

This pragma is equivalent to the following sequence of pragmas:

```
pragma Suppress (Access_Check);
pragma Suppress (Discriminant_Check);
pragma Suppress (Division_Check);
pragma Suppress (Elaboration_Check);
pragma Suppress (Index_Check);
pragma Suppress (Length_Check);
pragma Suppress (Overflow_Check);
pragma Suppress (Range_Check);
pragma Suppress (Storage_Check);
```

Note that, like pragma Suppress, pragma Suppress_All does not prevent the raising of certain exceptions. For example, numeric overflow or dividing by zero is detected by the hardware, which results in the predefined exception Numeric_Error. Refer to Chapter 5, "Runtime Organization," for more information.

Pragma Suppress_All must appear immediately within a declarative part.

Pragma Ast_Entry

A VAX/VMS system service call that employs an AST (see ASTs in the *VAX/VMS System Services Reference Manual*) requires a task entry for a rendezvous. Such a task entry must be identified with a Pragma Ast_Entry in the task specification that accepts the AST call.

The pragma Ast_Entry has a single argument that identifies the task entry.

The complete syntax for this pragma is:

```
pragma_ast_entry    ::=  PRAGMA AST_ENTRY(simple_name);
```

The pragma Ast_Entry must appear after the task entry declaration.

To employ an AST, a system service call must identify the task entry that will be called as the result of the AST. This is done by passing to the system service the name of the entry in the form of an Ast_Entry attribute. See the section "Implementation-Dependent Attributes" below.

IMPLEMENTATION-DEPENDENT ATTRIBUTES

There are two implementation-dependent attribute as follows:

'Ast_Entry

This attribute specifies the address of a task entry to be called in response to an AST. Entry_Name'Ast_Entry, where Entry_Name is the name of a task entry, is normally used as the **astadr** formal parameter to a VMS system service call.

'Null_Parameter

For an object of type or subtype K, K'Null_Parameter denotes a null object with address zero. The null object can only be used as the default for a formal parameter in an imported program or in an actual subprogram call in an imported subprogram. When an optional argument is to be omitted in calls to non-Ada subprograms the argument is replace by the null object.

PACKAGE STANDARD (*LRM Annex C*)

Package Standard defines all the predefined identifiers in the language.

```
package Standard is

    type *Universal_Integer* is ...
    type *Universal_Real* is ...
    type *Universal_Fixed* is ...
    type Boolean is (False, True);
```

```
    type Integer is range -2147483648 .. 2147483647;
    type Short_Short_Integer is range -128 .. 127;
    type Short_Integer is range -32768 .. 32767;

    type Float is digits 6 range -16#1.FFFF_FE# * 2.0 ** 126 ..
                                  16#1.FFFF_FE# * 2.0 ** 126;

    type Long_Float is digits 9 range -16#1.FFFF_FFFF_FFFF_F# * 2.0 ** 126 ..
                                    .. 16#1.FFFF_FFFF_FFFF_F# * 2.0 ** 126;

    type Duration is delta 16#1.0# * 2.0 ** (-14)
                        range -16#1.0# * 2.0 ** 17 ..
                                16#1.FFFF_FFFC# * 2.0 ** 16;

    subtype Natural is Integer range 0 .. 2147483647;
    subtype Positive is Integer range 1 .. 2147483647;

    type Character is ...

    type String is array (Positive range <>) of Character;
    pragma Pack (String);

    package Ascii is ...

    Constraint_Error : exception;
    Numeric_Error : exception;
    Storage_Error : exception;
    Tasking_Error : exception;
    Program_Error : exception;


end Standard;
```

The following table shows the default integer and floating-point types:

Supported Integer and Floating-Point Types

Ada Type Name	Size
Short_Short_Integer	8 bits
Short_Integer	16 bits
Integer	32 bits
Float	32 bits
Long_Float	64 bits

Fixed-point types are implemented using the smallest discrete type possible; it may be 8, 16, or 32 bits. Standard.Duration is 32 bits.

PACKAGE SYSTEM (*LRM 13.7*)

```
package System is

    type Address is private;

    type Name is (Vax_Vms);

    System_Name : constant Name := Vax_Vms;




    Storage_Unit : constant := 8;
    Memory_Size : constant := +(2 ** 31) - 1;

    Min_Int : constant := -(2 ** 31);
    Max_Int : constant := +(2 ** 31) - 1;

    Max_Digits : constant := 9;
    Max_Mantissa : constant := 31;
    Fine_Delta : constant := 1.0 / (2.0 ** 31);
    Tick : constant := 1.0 / 100.0;

    subtype Priority is Integer range 0 .. 255;

    function To_Address (Value : Integer) return Address;
    function To_Integer (Value : Address) return Integer;



    function "+" (Left : Address; Right : Integer) return Address;
    function "+" (Left : Integer; Right : Address) return Address;
    function "-" (Left : Address; Right : Address) return Integer;
    function "-" (Left : Address; Right : Integer) return Address;

    function "<" (Left, Right : Address) return Boolean;
    function "<=" (Left, Right : Address) return Boolean;
    function ">" (Left, Right : Address) return Boolean;
    function ">=" (Left, Right : Address) return Boolean;
    --
    --  The functions above are unsigned in nature.  Neither Numeric_Error
    --  nor Constraint_Error will ever be propagated by these functions.
    --
    --  Note that this implies:
    --
    --          To_Address (Integer'First) > To_Address (Integer'Last)
    --
    --  and that:
    --
    --          To_Address (0) < To_Address (-1)
```

```
    --
    --  Also, the unsigned range of Address includes values which are
    --  larger than those implied by Memory_Size.
    --

    Address_Zero : constant Address;

private

    . . .

end System;
```

REPRESENTATION CLAUSES AND CHANGES OF REPRESENTATON

The VAX/VMS CDF support for representation clauses is described in this section with reference to the relevant section of the LRM. Usage of a clause that is unsupported as specified in this section or usage contrary to LRM specification will cause a semantic error unless specifically noted.

Length Clauses (*LRM 13.2*)

Length clauses are supported for the VAX/VMS CDF as follows:

- The value in a 'Size clause must be a positive static integer expression. 'Size clauses are supported for all scalar and composite types, including derived types, with the following restrictions:
  - — For all types the value of the size attribute must be greater than equal to the minimum size necessary to store the largest possible value of the type.
  - — For discrete types, the value of the size attribute must be less than or equal to 32.
  - — For fixed types, the value of the size attribute must be less than or equal to 32.
  - — For float types, the size clause can only specify the size the type would have if there were no clause.
  - — For access and task types, the value of the size attribute must be 32.
  - — For composite types, a size specification must not imply compression of composite components. Such compression must have been explicitly requested using a length clause or pragma Pack on the component type.
- 'Storage_Size clauses are supported for access and task types. The value given in a Storage_Size clause may be any integer expression, and it is not required to be static.
- 'Small clauses are supported for fixed point types. The value given in a 'Small clause must be a non-zero static real number.

Enumeration Representation Clauses (*LRM 13.3*)

Enumeration representation clauses are supported with the following restrictions.

- The values given in the clause must be in ascending order.
- Every enumeration literal must have a unique integer value assigned to it.
- The allowable values for an enumeration clause range from (Integer'First + 1) to Integer'Last.
- Negative numbers are allowed.

Record Representation Clauses (*LRM 13.4*)

Both full and partial representation clauses are supported for both discriminated and undiscriminated records. The ***static_simple_expression*** in the alignment clause part of a record representation clause (see LRM 13.4 (4)) must be a power of two with the following limits: `1 <=` ***static_simple_expression*** `<=` 16 .

The size specified for a discrete field in a component clause must not exceed 32.

Implementation-Dependent Components

The LRM allows for the generation of names denoting implementation-dependent components in records. For the VAX/VMS CDF, there are no such names visible to the user.

Address Clauses (*LRM 13.5*)

Address clauses are not supported and will generate a semantic error if used..

Change of Representation (*LRM 13.6*)

Change of representation is supported wherever it is implied by support for representation specifications. In particular, type conversions between array types or record types may cause packing or unpacking to occur; conversions between related enumeration types with different representations may result in table lookup operations.

OTHER IMPLEMENTATION-DEPENDENT FEATURES

Machine Code (*LRM 13.8*)

Machine-code insertions are not supported at this time.

Unchecked Storage Deallocation (*LRM 13.10.1*)

Unchecked storage deallocation is implemented by the generic function `Unchecked_Deallocation` defined by the LRM. This procedure can be instantiated with an object type and its access type resulting in a procdure that deallocates the object's storage.

Objects of any type may be deallocated.

The storage reserved for the entire collection is reclaimed when the program exits the scope in which the access type is declared. Placing an access type declaration within a block can be a useful implementation strategy when conservation of memory is necessary.

Erroneous use of dangling references may be detected in certain cases. When detected, the exception Storage_Error is raised. Deallocation of objects that were not created through allocation (ie through Unchecked_Conversion) may also be detected in certain cases and raises Storage_Error.

Unchecked Type Conversion (*LRM 13.10.2*)

Unchecked conversion is implemented by the generic function `Unchecked_Conversion` defined by the LRM. This function can be instantiated with *Source* and *Target* types resulting in a function that converts source data values into target data values.

Unchecked conversion moves storage units from the source object to the target object sequentially, starting with the lowest address. Transfer continues until the source object is exhausted or the target object runs out of room. If the target is larger than the source then the remaining bits are undefined. Depending on the target computer architecture, the result of conversions may be right or left aligned.

Restrictions on Unchecked Type Conversion

- The target type of an unchecked conversion cannot be an unconstrained array type or an unconstrained discriminated type without default discriminants.
- Internal consistency among components of the target type is not guaranteed. Discriminant components may contain illegal values or be inconsistent with the use of those discriminants elsewhere in the type representation.

CHARACTERISTICS OF I/O PACKAGES

This section specifies the implementation-dependent characteristics of the I/O packages Sequential_Io, Direct_Io, Text_Io, and Io_Exceptions. These packages are located in the library !Targets.Vax_Vms.Io. Non-dependent characteristics are as given in Chapter 14 of the LRM. Each section below sites the relevant section in Chapter 14.

Package Low_Level_Io is not provided for the Vax_Vms target.

External Files and File Objects (*LRM 14.1*)

An external file is identified by a Name. The allowable strings for the Name are the legal file names and full or relative pathlists accepted by VMS. See the VAX/VMS User's Manual for details.

If a main program completes without closing some Text_Io, Seq_Io, or Direct_Io file, then some or all data output to the file may not be included in the associated external file.

Input and output are erroneous for access types.

Sequential and Direct Files

This section deals with implementation-dependent features associated with the packages Sequential_Io and Direct_Io and the file types *sequential access* and *direct access*.

File Management (*LRM 14.2.1*)

The exception Use_Error is raised in the following situations:

- By the procedure Open if the executing process does not have correct access rights for the external file.
- By the procedure Open if another process has already opened the external file for exclusive use.
- By the procedure Open if the external file is currently opened by another process with mode Out or Inout.

Sequential Input-Output (*LRM 14.2.2*)

For the Read procedure of Sequential_Io, the exception Data_Error is only raised when the size of the data read from the file is greater than the size of the out parameter Item.

Direct Input-Output (*LRM 14.2.4*)

Package Direct_Io may not be instantiated with any type which is either an unconstrained array type or a discriminated record type without default discriminants. A semantic error is reported when attempting to install any unit which contains an instantiation where the actual type is such a forbidden type.

For the Read procedure of Direct_Io, there is no check performed to ensure that the data read from the file can be interpreted as a value of the Element_Type.

Specification of the Package Direct_Io (*LRM 14.2.5*)

The declaration of the type Count in the package Direct_Io is

```
type Count is new Integer range 0 .. Integer'Last;
```

Text Input-Output (*LRM 14.3*)

The Text_Io default input and output files are associated with the VMS standard input and standard output paths respectively. The terminators used by Text_Io are the sequence Ascii.Cr, Ascii.Lf for the line terminator, and the sequence Ascii.Ff, Ascii.Lf for the page terminator, except for terminators at the end of file which are implicit and not represented by any characters.

Specification of the Package Text_Io (*LRM 14.3.10*)

The declaration of the type Count in Text_Io is

```
type Count is range 0 .. 1_000_000_000;
```

The declaration of the subtype Field in Text_Io is

```
subtype Field is Integer range 0 .. Integer'Last;
```

Exceptions in I/O (*LRM 14.4*)

The execeptions raised in input-output operations are:

- The exceptions as specified in LRM 14.4
- The exception Use_Error as specified in the two file management subsections above.
- The exception Device_Error, raised for any input-output operation that performs an Os2000 I/O system call returning as status the error code E$Read or E$Write
- The exception Device_Error, raised if the status returned from any VAX/VMS I/O call is not one of: ACS, BUSY, CONTROLO, CONTROLC, CONTROLY, CRE, CREATED, CRE_STM, CUR, DEL, DUI, EOF, FAC, FEX, FLK, FNF, FNM, IDR, LNE, NMF, NOD, NORMAL, OK_ALK, OK_DEL, OK_NOP, OK_RLK, OK_RNF, OK_RRL, OK_WAT, PENDING.

APPENDIX C

TEST PARAMETERS

Certain tests in the ACVC make use of implementation-dependent values, such as the maximum length of an input line and invalid file names. A test that makes use of such values is identified by the extension .TST in its file name. Actual values to be substituted are represented by names that begin with a dollar sign. A value must be substituted for each of these names before the test is run. The values used for this validation are given below.

Name and Meaning	Value
$ACC_SIZE An integer literal whose value is the number of bits sufficient to hold any value of an access type.	32
$BIG_ID1 An identifier the size of the maximum input line length which is identical to $BIG_ID2 except for the last character.	(1..253 => 'A', 254 => '1')
$BIG_ID2 An identifier the size of the maximum input line length which is identical to $BIG_ID1 except for the last character.	(1..253 => 'A', 254 => '2')
$BIG_ID3 An identifier the size of the maximum input line length which is identical to $BIG_ID4 except for a character near the middle.	(1..126 => 'A', 127 => '3' 128..254 => 'A')

TEST PARAMETERS

Name and Meaning	Value
$BIG_ID4 An identifier the size of the maximum input line length which is identical to $BIG_ID3 except for a character near the middle.	(1..12 => 'A', 127 => '4', 128..254 => 'A')
$BIG_INT_LIT An integer literal of value 298 with enough leading zeroes so that it is the size of the maximum line length.	(1..251 => '0', 252..254 => "298")
$BIG_REAL_LIT A universal real literal of value 690.0 with enough leading zeroes to be the size of the maximum line length.	(1..249 => '0', 250..254 => "690.0")
$BIG_STRING1 A string literal which when catenated with BIG_STRING2 yields the image of BIG_ID1.	(1 => '"', 2..128 => 'A', 129 => '"')
$BIG_STRING2 A string literal which when catenated to the end of BIG_STRING1 yields the image of BIG_ID1.	(1 => '"', 2..127 => 'A', 128 => '1', 129 => '"')
$BLANKS A sequence of blanks twenty characters less than the size of the maximum line length.	(1..234 => ' ')
$COUNT_LAST A universal integer literal whose value is TEXT_IO.COUNT'LAST.	1000000000
$DEFAULT_MEM_SIZE An integer literal whose value is SYSTEM.MEMORY_SIZE.	2147483647
$DEFAULT_STOR_UNIT An integer literal whose value is SYSTEM.STORAGE_UNIT.	8

Name and Meaning	Value
$DEFAULT_SYS_NAME The value of the constant SYSTEM.SYSTEM_NAME.	VAX_VMS
$DELTA_DOC A real literal whose value is SYSTEM.FINE_DELTA.	0.000000000465661287307739257812 5
$FIELD_LAST A universal integer literal whose value is TEXT_IO.FIELD'LAST.	2147483647
$FIXED_NAME The name of a predefined fixed-point type other than DURATION.	NO_SUCH_FIXED_TYPE
$FLOAT_NAME The name of a predefined floating-point type other than FLOAT, SHORT_FLOAT, or LONG_FLOAT.	NO_SUCH_FLOAT_TYPE
$GREATER_THAN_DURATION A universal real literal that lies between DURATION'BASE'LAST and DURATION'LAST or any value in the range of DURATION.	1.0
$GREATER_THAN_DURATION_BASE_LAST A universal real literal that is greater than DURATION'BASE'LAST.	131073.0
$HIGH_PRIORITY An integer literal whose value is the upper bound of the range for the subtype SYSTEM.PRIORITY.	255
$ILLEGAL_EXTERNAL_FILE_NAME1 An external file name which contains invalid characters.	\NODIRECTORY\FILENAME
$ILLEGAL_EXTERNAL_FILE_NAME2 An external file name which is too long.	THIS-FILE-NAME-IS-TOO-LONG-FOR-MY-SYSTEM
$INTEGER_FIRST A universal integer literal whose value is INTEGER'FIRST.	-2147483648

TEST PARAMETERS

Name and Meaning	Value
$INTEGER_LAST A universal integer literal whose value is INTEGER'LAST.	2147483647
$INTEGER_LAST_PLUS_1 A universal integer literal whose value is INTEGER'LAST + 1.	2147483648
$LESS_THAN_DURATION A universal real literal that lies between DURATION'BASE'FIRST and DURATION'FIRST or any value in the range of DURATION.	-1.0
$LESS_THAN_DURATION_BASE_FIRST A universal real literal that is less than DURATION'BASE'FIRST.	-131073.0
$LOW_PRIORITY An integer literal whose value is the lower bound of the range for the subtype SYSTEM.PRIORITY.	0
$MANTISSA_DOC An integer literal whose value is SYSTEM.MAX_MANTISSA.	31
$MAX_DIGITS Maximum digits supported for floating-point types.	9
$MAX_IN_LEN Maximum input line length permitted by the implementation.	254
$MAX_INT A universal integer literal whose value is SYSTEM.MAX_INT.	2147483647
$MAX_INT_PLUS_1 A universal integer literal whose value is SYSTEM.MAX_INT+1.	2147483648
$MAX_LEN_INT_BASED_LITERAL A universal integer based literal whose value is 2#11# with enough leading zeroes in the mantissa to be MAX_IN_LEN long.	(1..2 => "2:", 3..251 => '0', 252..254 => "11:")

Name and Meaning	Value
$MAX_LEN_REAL_BASED_LITERAL A universal real based literal whose value is 16:F.E: with enough leading zeroes in the mantissa to be MAX_IN_LEN long.	(1..3 => "16:", 4..250 => '0', 251..254 => "F.E:")
$MAX_STRING_LITERAL A string literal of size MAX_IN_LEN, including the quote characters.	(1 => '"', 2..253 => 'A', 254 => '"')
$MIN_INT A universal integer literal whose value is SYSTEM.MIN_INT.	-2147483648
$MIN_TASK_SIZE An integer literal whose value is the number of bits required to hold a task object which has no entries, no declarations, and "NULL;" as the only statement in its body.	32
$NAME A name of a predefined numeric type other than FLOAT, INTEGER, SHORT_FLOAT, SHORT_INTEGER, LONG_FLOAT, or LONG_INTEGER.	SHORT_SHORT_INTEGER
$NAME_LIST A list of enumeration literals in the type SYSTEM.NAME, separated by commas.	VAX_VMS
$NEG_BASED_INT A based integer literal whose highest order nonzero bit falls in the sign bit position of the representation for SYSTEM.MAX_INT.	16#FFFFFFFE#
$NEW_MEM_SIZE An integer literal whose value is a permitted argument for pragma MEMORY_SIZE, other than $DEFAULT_MEM_SIZE. If there is no other value, then use $DEFAULT_MEM_SIZE.	2147483647

TEST PARAMETERS

Name and Meaning	Value
$NEW_STOR_UNIT An integer literal whose value is a permitted argument for pragma STORAGE_UNIT, other than $DEFAULT_STOR_UNIT. If there is no other permitted value, then use value of SYSTEM.STORAGE_UNIT.	8
$NEW_SYS_NAME A value of the type SYSTEM.NAME, other than $DEFAULT_SYS_NAME. If there is only one value of that type, then use that value.	VAX_VMS
$TASK_SIZE An integer literal whose value is the number of bits required to hold a task object which has a single entry with one 'IN OUT' parameter.	32
$TICK A real literal whose value is SYSTEM.TICK.	0.01

APPENDIX D

WITHDRAWN TESTS

Some tests are withdrawn from the ACVC because they do not conform to the Ada Standard. The following 44 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.

a. E28005C: This test expects that the string "-- TOP OF PAGE. --63" of line 204 will appear at the top of the listing page due to a pragma PAGE in line 203; but line 203 contains text that follows the pragma, and it is this text that must appear at the top of the page.

b. A39005G: This test unreasonably expects a component clause to pack an array component into a minimum size (line 30).

c. B97102E: This test contains an unintended illegality: a select statement contains a null statement at the place of a selective wait alternative (line 31).

d. C97116A: This test contains race conditions, and it assumes that guards are evaluated indivisibly. A conforming implementation may use interleaved execution in such a way that the evaluation of the guards at lines 50 & 54 and the execution of task CHANGING_OF_THE_GUARD results in a call to REPORT.FAILED at one of lines 52 or 56.

e. BC3009B: This test wrongly expects that circular instantiations will be detected in several compilation units even though none of the units is illegal with respect to the units it depends on; by AI-00256, the illegality need not be detected until execution is attempted (line 95).

f. CD2A62D: This test wrongly requires that an array object's size be no greater than 10 although its subtype's size was specified to be 40 (line 137).

g. CD2A63A..D, CD2A66A..D, CD2A73A..D, and CD2A76A..D (16 tests): These

tests wrongly attempt to check the size of objects of a derived type (for which a 'SIZE length clause is given) by passing them to a derived subprogram (which implicitly converts them to the parent type (Ada standard 3.4:14)). Additionally, they use the 'SIZE length clause and attribute, whose interpretation is considered problematic by the WG9 ARG.

h. CD2A81G, CD2A83G, CD2A84M..N, and CD50110 (5 tests): These tests assume that dependent tasks will terminate while the main program executes a loop that simply tests for task termination; this is not the case, and the main program may loop indefinitely (lines 74, 85, 86, 96, and 58, respectively). CD2B15C and CD7205C: These tests expect that a 'STORAGE_SIZE length clause provides precise control over the number of designated objects in a collection; the Ada standard 13.2:15 allows that such control must not be expected.

i. CD2D11B: This test gives a SMALL representation clause for a derived fixed-point type (at line 30) that defines a set of model numbers that are not necessarily represented in the parent type; by Commentary AI-00099, all model numbers of a derived fixed-point type must be representable values of the parent type.

j. CD5007B: This test wrongly expects an implicitly declared subprogram to be at the address that is specified for an unrelated subprogram (line 303).

k. ED7004B, ED7005C..D, and ED7006C..D (5 tests): These tests check various aspects of the use of the three SYSTEM pragmas; the AVO withdraws these tests as being inappropriate for validation.

l. CD7105A: This test requires that successive calls to CALENDAR.CLOCK change by at least SYSTEM.TICK; however, by Commentary AI-00201, it is only the expected frequency of change that must be at least SYSTEM.TICK--particular instances of change may be less (line 29).

m. CD7203B and CD7204B: These tests use the 'SIZE length clause and attribute, whose interpretation is considered problematic by the WG9 ARG.

n. CD7205D: This test checks an invalid test objective: it treats the specification of storage to be reserved for a task's activation as though it were like the specification of storage for a collection.

o. CE2107I: This test requires that objects of two similar scalar types be distinguished when read from a file--DATA_ERROR is expected to be raised by an attempt to read one object as of the other type. However, it is not clear exactly how the Ada standard 14.2.4:4 is to be interpreted; thus, this test objective is not considered valid (line 90).

p. CE3111C: This test requires certain behavior, when two files are associated with the same external file, that is not required by the

Ada standard.

q. CE3301A: This test contains several calls to END_OF_LINE and END_OF_PAGE that have no parameter: these calls were intended to specify a file, not to refer to STANDARD_INPUT (lines 103, 107, 118, 132, and 136).

r. CE3411B: This test requires that a text file's column number be set to COUNT'LAST in order to check that LAYOUT_ERROR is raised by a subsequent PUT operation. But the former operation will generally raise an exception due to a lack of available disk space, and the test would thus encumber validation testing.

EAB51ZE
CLASSIFICATION: UNCLASSIFIED
7 \01 AD B138725
7 \02 p040100, p200600, p170500, IW220/5NI
\03 U
\05 FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH
\06 Optics of the Atmosphere (Selected Articles).
\11 19891109
\12 94
\14 FTD-ID(RS)T-0817-89
\20 U
\21 Partially edited machine trans. of Optika Atmosfery (USSR) v1 n8 p3-12, 26-30, 84-90, 97-104, 105-110, 127-129, Aug 1988.
\22 Distribution authorized to US Gov't. agencies and their contractors; Copyright; Specific Authority; 9 Nov 89. Other requests shall be referred to FTD/STINFO, Wright-Patterson AFB, OH 45433.
4 \23
4 \24 U
\26
3 \27 Contents: Lidar Complexes: =Contem= =porary= State and Prospects; Laser Induced Fluorescence of Vapors <H2O>; Accuracy of =Polarizational= Lidar Measurements; Lidar Measurements of the Speed of Clouds; Lidar Investigations of Wave Disturbances in the Atmosphere, Generated by Solar Terminator; and Lidar Observation of the Upper Deck of the Eruptive Cloud of the Volcano of El-=Chichon= =Avove= =Ashkhabad=. Russian translations. (jhd)
\28 U
\29 2
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\35 141600
\36 2
\40 3907
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EAB51ZE
CLASSIFICATION: UNCLASSIFIED
9 \01 AD-B138788
\02 p110400
\03 U
\05 ABARIS REND NV
3 \06 Assessment of Fiber Reinforced Plastics for Combatant Submarine Structures. Phase <1>. Volume <1>.
3 \09 Final rept. <31> Dec <86>-<30> Aug <87>,
\10 Murphy, William L.
\11 19870430
\12 76
\15 N00024-C-87-5122
\20 U
\22 Distribution authorized to DoD only; Proprietary Info.; 5 Dec 89. Other requests shall be referred to Naval Sea Systems Command, Code SEA 0035, Washington, DC 20361. Availability: Microfiche copies only.
4 \23
4 \24 U
\2€
3 \27 This was a feasibility study to determine the applicability of =fibe= h-reinforced plastic composite materials for combatant submarine structures. These materials offer a range of improved operational capability for combatant submarines. Structures analyzed were the pressure hull, high pressure gas flasks, weapons stowage structure, control surfaces, bed plates, pipe hangars and non built-in tanks. It was determined that combatant submarines would benefit from the application of composites. Composites are non-magnetic and would save weight. The U.S. composites industry has the capability of building a composite submarine. The pressure hull is a strong candidate for the use of composites. A top level program plan for the development and demonstrated qualification of composites for a pressure hull was prepared. Thermoplastics; Submarine pressure hulls; Ship structural components. (edc)
\28 U
\29 1
9 \33 4, 35
\34 F
\35 398041
\36 2
\40 3202
\41 4
DESCRIPTORS AND CLASS INCONSISTENT

CLASSIFICATION: UNCLASSIFIED

4 \01 AD A215516
\02 p150300, s050400
\03 U
\05 RAND CORP SANTA MONICA CA
\06 The Current Debate Over Soviet Defense Policy.
\10 Roman, Josephine J.
\11 19890100
\12 30
\14 P-7526
\20 U
4 \23
4 \24 U
\26
3 \27 =Gorbachev='s new political thinking on national security issues poses a profound challenge to the Soviet military. He has encouraged civilian =intellectuals= to actively participate in the formulation of Soviet defense policy, and, in so doing, has threatened the professional military's monopoly on setting the defense agenda. It is still too early to predict which of these two groups will take the lead in formulation of Soviet defense policy. =Gorbachev='s announcement of unilateral troop reductions reflects the views put forth by many civilian defense analysts. If however, the rumors that are true, this may signal the strengthening of the military's role in setting the defense agenda. The implications of =Gorbachev='s new political thinking on foreign policy and national security issues hold profound implications for the West, too. Over the last three years, the Soviet Union's actions, especially in the arms control arena, have proven that political thinking offers the West an unprecedented opportunity to address many of the most important issues facing mankind, including ares control and the arms race, human rights, and environmental issues. As =Gorbachev='s speech to the U.N. General Assembly demonstrated, the Soviet Union is ready and willing to seize the initiative on many of these issues. (EDC)
\28 U
\29 2
\33 1
\35 296600
\36 1
\40 0628
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DESCRIPTORS AND CLASS INCONSISTENT

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4 \01 AD A215519
\02 p010311
\03 U
\05 AEROLIFT INC TILLAMOOK OR
3 \06 Further Development and Limited Flight Testing of the CycloCrane.
4 \09 Quarterly technical rept.
\11 19890630
\12 76
\15 MDA972-88-C-0058, $$ARPA Order-6390
\20 U
4 \23
4 \24 U
\26
3 \27 The basic scope of this program is to identify military missions, develop design configurations, refurbish and modify the existing =CycloCrane=, demonstrate operational procedures, and develop program plan. A detailed plan for the implementation of the present program has been developed and the costs and schedules associated with the plan are being monitored and managed. Due to a redirection of focus mandated by DARPA, the mission analysis element of the program was terminated on June <30>, <1989>. Because of this redirection, several high-probability military missions had to be abandoned. The refurbishment task is essentially complete, the remaining major tasks being adjustment of the aircraft flight controls and the rigging. Modification tasks completed during the quarter include the design and stress analysis of the 'Y' tail and fabrication of approximately half of the detail parts for same. The hydraulic system has been inspected and checked, most engine tests have been completed, and bench tests of the avionics systems are complete. The flight test plan was cleared for open publication in May. Although there has been some slippage, this document will serve as Aerolift's primary document for conducting the limited flight tests. As of June <30>, =Aerolift= had tested and modified the =Hirth= F-<30> engine. (JHD)
\28 U
\29 2
\33 1
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\40 4101
\41 4
DESCRIPTIVE NOTE PUNCTUATION IMPROPER
DESCRIPTORS AND CLASS INCONSISTENT

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CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215521
\02 p120500
\03 U
\05 MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB
\06 Precision Tracking of Low-Earth Objects with a Modified Astronomical Mount
\09 Journal article.
\10 Gibson, David M.
Manke, Michael P.
Trujillo, Peter J.
Shelly, Frank C.
Beatty, David E.
\11 19890000
\12 11
\14 MS-8148
\15 F19628-90-C-0002
\16 649L
\18 ESD
ELECTRONIC SYSTEMS DIV HANSCOM AFB MA
\19 TR-89-274
\20 U
\21 Pub. in SPIE (Society of Photo-Optical Instrumentation Engineers), v1111 p367-376 1989.
4 \23
4 \24 U
\25 PE63250F.
\26 U
3 \27 A Boller & Chivens astronomical mount has been modified and upgraded to enable precision tracking of near-earth objects. A two-step process is employed: <1>) ephemeris-based pointing to bring the object in or near the telescope field-of-view, and <2>) automatic video tracking (AVT) to grab and center the object. Tracking rates in excess of <3> deg/s in each coordinate have been achieved. When operated in the AVT mode, observed pointing errors, even at the above rates, rarely exceed <1> pixel (<2>-<5> arcsec). Keywords: Ephemeris based pointing; Automatic video tracking; Precision tracking; Reprints. (JHD)
\28 U
\29 1
\30 Reprint: Precision Tracking of Low-Earth Objects with a Modified Astronomical Mount.
\33 1, 20
\35 207650
\36 1
\40 2505
\41 2
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4 \01 AD-A215546
\02 p120500
\03 U
\05 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND LOGISTIC S
\06 Validation of an Exponentially Decreasing Failure Rate Software Reliability Model.
\09 Master's thesis,
\10 Westgate, Charles J., III
\11 19890900
\12 119
\14 AFIT/GLM/LSY/89S-71
\20 U
4 \23
4 \24 U
\26
3 \27 The purpose of this thesis was to determine the validity of a =softw= are reliability estimation model proposed by the Air Force Operational Test and Evaluation Center (AFOTEC). During the last forty years of the computer era, the demand for software has been growing at a rate of twelve percent per year; and about fifty percent of the total life cycle cost of a software system is attributed to software fault increases dramatically as the life cycle progresses. It was statistics like those discussed above that prompted this research. The research had these specific objectives: the first was ascertaining the soundness of the =model's intrinsic logic. The second objective was to run the =model with= actual failure data to measure the validity and correlation of the data with the model. The final objective was to determine the assumptions required to operate the model. (KR)
\28 U
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\33 1
\35 012250
\36 1
\40 3907
\41 F
DESCRIPTORS AND CLASS INCONSISTENT

CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215554
\02 p061000
\03 U
\05 ARMY RESEARCH INST OF ENVIRONMENTAL MEDICINE NATICK MA
\06 Children in Extreme Environments.
\10 Armstrong, Lawrence E.
\11 19890817
\12 3
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3 \27 =Preadolescents= do not respond to extremely hot, or cold, =environments= in the same ways that adults do. This brief article is written in an ask the expert format, per request of the journal editor, to describe the physiological responses of children for the =athlete=, practitioner and researcher. This article describes the responses of children, in comparison to adults, during =exercise= in hot and cold environments, as well ad during swimming. Brief explanations for differences between children and adults are given. Keywords: Stress physiology; Response biology; =Preadolescents=; Physiological responses; Hot environments; Cold environments; Water immersion; Sweat rate; Heat acclimatization; Skin blood flow. (KT)
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\35 040850
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DESCRIPTORS AND CLASS INCONSISTENT

EAB51ZR
CLASSIFICATION UNCLASSIFIED
4 \01 AD-A215560
\02 p170403, s170900
\03 U
\05 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND LOGISTIC S
\06 Modeling the Response of a Monopulse Radar to Impulsive Jamming Signals Using the Block Oriented System Simulator (BOSS).
\09 Master's thesis
\10 Long, Jeffrey K.
\11 19890900
\12 88
\14 AFIT/GE/ENG/89D-26
\20 U
4 \23
4 \24 U
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3 \27 This theses developed computer models of two types of amplitude comparison =monpulse= processors using the Block Oriented System Simulation (BOSS) software package and to determine the response to these models to impulsive input signals. This study was an effort to determine the susceptibility of =monpulse= tracking radars to impulsing jamming signals. Two types of amplitude comparison monopulse receivers were modeled, one using logarithmic amplifiers and the other using automatic gain control for signal normalization. Simulations of both types of systems were run under various conditions of gain or frequency imbalance between the two receiver channels. The resulting errors from the imbalanced simulations were compared to the outputs of similar, baseline simulations which had no electrical imbalances. The accuracy of both types of processors was directly affected by gain or frequency imbalances in their receiver channels. In most cases, it was possible to generate both positive and negative angular errors, dependent upon the type and degree of mismatch between the channels. The system most susceptible to induced errors was a frequency imbalanced processor which used AGC circuitry. Any errors introduced will be a function of the degree of mismatch between the channels and therefore would be difficult to exploit reliably.
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\35 012250
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DESCRIPTORS AND CLASS INCONSISTENT

CLASSIFICATION: UNCLASSIFIED
4 \01 AD A215563
\02 p150607
\03 U
\05 ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS
SCHOOL OF ADVANCED MILITARY STUDIES
\06 AirLand Battle and SOF: A Proposal for an Interim Doctrine
for Joint Special Operations.
\10 Fondacaro, Steve A.
\11 19890519
\12 57
\20 U
4 \23
4 \24 U
\26
3 \27 This study offers the Army's AirLand Battle doctrine as an
-interim doctrine for SOF (Special Operations Force)
employment pending the development of approved doctrine of
its own. The paper then briefly discusses the relation of
SOF employment to AirLand Battle. The primary focus is on
AirLand Battle's four tenets: agility, depth, initiative
and synchronization. The study establishes these tenets as
the criteria for evaluation of selected historical
examples. Three historical examples are selected for
evaluation using an AirLand Battle evaluation framework.
The Son Tay raid (Operation =KINGPIN=, <1970>), the Iran
Hostage Rescue (Operation RICE BOWL, <1980>) and the
Israeli raid on Entebbe Airport (Operation THUNDERBOLT,
<1976>). All operations are discussed in relation to their
application of AirLand Battle's four tenets. The
application or failure to apply these tenets are related
to the success or failure of the operation, and set the
stage for the concluding discussion. The study concludes
that AirLand Battle is directly applicable to joint
special operations. ~~The concluding discussion shows how~~
~~special operations~~ The concluding discussion shows how
special operations, though tactical operations by small
forces, have strategic impact. (JHD)
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\35 416090
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\40 2002
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DESCRIPTORS AND CLASS INCONSISTENT

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CLASSIFICATION UNCLASSIFIED
4 \01 AD-A215566
\02 p150600
\03 U
\05 ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS
SCHOOL OF ADVANCED MIL ITARY STUDIES
4 \06 Operational Fires: Do They Require a Theater =FSCOORD=?
4 \10 Bradley, Michael J.
\11 19890517
\12 55
\20 U
4 \23
4 \24 U
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3 \27 This monograph examines the modern development of operational fires as a major contributor to the success of campaigns. Its focus is to determine the best way for the U.S. military to maximize the impact of operational fire systems. It proposes that a =FSCOORD= is needed at the theater level to accomplish that campaign requirement. The analysis begins with an examination of recent U.S. Army doctrine concerning the operational level of war and the Relative Combat Power Model. This model relates the combat power elements of maneuver, firepower, protection and leadership. The work then defines operational fires in light of the model and current doctrine. It then traces the use of these fires in the modern era using historical examples. Particular attention is then devoted to the current Soviet and U.S. positions on the subject. Of particular interest is the Soviet concern with 'high precision warfare', which is a form of operational fires. Operational fires; Combat power model; High precision warfare; Campaign planning; Synchronization. (jes)
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TITLE PUNCTUATION IMPROPER
DESCRIPTORS AND CLASS INCONSISTENT

EAB51ZR
CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215568
\02 p150600, p050600
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\05 ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS
SCHOOL OF ADVANCED MILITARY STUDIES
4 \06 =Winfield= Scott's Mexico City Operation: The Genesis of
American Operational Art?
4 \10 Cope, James A.
\11 19890512
\12 59
\20 U
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4 \24 U
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3 \27 This monograph addresses the beginning of the American
=version= of operational art. =Winfield= Scott's
participation in the Mexican War is analyzed to determine
whether his activity constitutes the =genesis= of American
operational art; joint operations, distinct lines of
operation, multiple field armies, =operational=
intelligence, deep strikes, acceptance of risk, and
distributed operations. The Mexican War is assessed using
the definitions of article, The Loose Marble--and the
Origins of Operational Art=. The war is analyzed on two
levels: (th)overall planning and execution and the
specifics of Scott's Mexico City Operation. Schneider's
eleven characteristics of emerging operational art are the
theoretical bases of this analysis. Keywords: Operational
art; Joint operations; Amphibious operations; =Winfield=
Scott; General Grant; General Lee. (KT)
\28 U
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\41 A
TITLE PUNCTUATION IMPROPER
DESCRIPTORS AND CLASS INCONSISTENT

EAB5176
CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215574
\02 p060500, s050100, s050800
\03 U
\05 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND LOGISTIC S
\06 A Study of the Air Force Physical Fitness and Health Program.
\09 Master's thesis.
\10 Zejdlik, Joel M.
\11 19890900
\12 152
\14 AFIT/GSM/LSY/89S-47
\20 U
4 \23
4 \24 U
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3 \27 The purpose of this thesis was to investigate physical fitness attitudes and perceptions of military members in a sedentary work environment. People in the acquisition management career field assigned to Aeronautical Systems Division (ASD) Wright-Patterson AFB, Ohio were polled on their attitudes on health and fitness. Data was collected using a survey questionnaire that duplicated a Air Command and Staff College study done in <1988>. This study focused on people in a non-physical working environment. The day-to-day routine did not include any useful aerobic activity. It was assumed that these people would not think fitness was as important as the people coming from a training environment. Generally, the ASD group was more polar than the training group. The ASD group was more likely to have a large percent of the people answer strongly agree and a significant number would have no opinion, while the training group would have a overall greater number of people who answered either agree or strongly agree with very few having no opinion. Even though the people in the sedentary working environment perceived fitness as important, they were less likely to take action to do anything about it. Theses.
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DESCRIPTORS AND CLASS INCONSISTENT

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CLASSIFICATION: UNCLASSIFIED
4 \01 AD A215677
\02 p060300, s080100
\03 U
\05 GEORGIA COOPERATIVE FISHERY AND WILDLIFE RESEARCH UNIT
ATHENS
3 \06 Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic). =Alewife= and =Blueback= Herring.
\09 Biological rept.,
\10 Bozeman, Earl L., Jr.
Avyle, Michael J.
\11 19890800
\12 25
\18 FWS, WES/TR/EL
FISH AND WILDLIFE SERVICE WASHINGTON D C
ARMY ENGINEER WATERWAYS EXPERIMENT STATION
VICKSBURG MS ENVIRONMENTAL LAB
\19 82(11.111), 82-4
\20 U
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3 \27 Species profiles (summaries of the literature on taxonomy, life history, and environmental requirements of coastal fishes and aquatic invertebrates) are prepared to assist with impact assessment. The =alewife= (=Alosa= =pseudoharengus=) and =blueback= herring (A. =aestivalis=) are morphologically and ecologically similar =anadromous= species of =clupeids=. The =blueback= herring is common throughout the South Atlantic Region, but the =alewife= occurs primarily in North Carolina and northern parts of South Carolina. These species spawn in spring in freshwater or brackish, =tidally= influenced portions of coastal rivers. =Blueback= herring initially use freshwater habitats for nursery areas, and then migrate =downriver= to brackish estuaries, where they =overwinter= prior to migrating to sea the following spring. =Alewives= use brackish water or tidal freshwater as nursery areas until they migrate to coastal waters in winter or the following spring. =Landlocked= populations of =blueback= herring occur in several southeastern reservoirs. Both species are ecologically important by serving as prey for many other fishes; they are economically important because they support commercial inshore and offshore fisheries. Little information is available on environmental factors that limit these species in the South Atlantic Region. Adults of both species have broad salinity tolerances, but =blueback= herring appear to require access to freshwater for successful reproduction. =Clupeidae=; Growth physiology; Feeding; Spawning; Habitat requirements. (edc)
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DESCRIPTORS AND CLASS INCONSISTENT

EAB51ZR
CLASSIFICATION UNCLASSIFIED
4 \01 AD-A215678
\02 p010307
\03 U
\05 ARMY AVIATION RESEARCH AND TECHNOLOGY ACTIVITY MOFFETT FIELD CA AEROFLIGHTDYN AMICS DIRECTORATE
\06 The Response of Helicopter Rotors to Vibratory Airload.
\10 Bousman, William G.
\11 19891114
\12 20
\20 U
\21 Presented at the American Helicopter Society National Special sts' Meeting on Rotorcraft Dynamics, Arlington, TX, 13 14 Nov 89.
4 \23
4 \24 U
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3 \27 Structural response data from flight or wind tunnel tests of eight full-scale rotors were examined and compared for high-speed flight conditions and in the absence of blade stall or maneuvers. Both similarities and differences in the behavior of the rotors were observed, and these findings are useful in determining appropriate tests for development of theoretical methods. Limited use is made of airload measurements and theoretical calculation in examining these data. Major similarities observed in the rotor behavior include: <1>) <3>/rev vibratory flap bending moments are remarkably similar among all the rotors at high speed; <2>) the root oscillatory chord bending induced by lag dampers is similar for three of the articulated rotors despite differences in the damper type; and <3>) torsion moment and pitch-link loads show same positive-negative loading over the advancing side of the disk caused by the unsteady pitching moments at the blade tip. Differences that were observed include: <1>) the vibratory chord bending-moment behavior appears to be dependent on rotor stiffness in part, but differences seen are not easily explained; <2>) the CH-<53A> root oscillatory chord bending-moment data do not show the damper-induced loads that are seen on the other articulated rotors with hydraulic lag dampers; and <3>) the AH-<1G> torsion response is very different from that of the articulated rotors. Rotor blades; Rotary wings. (edc)
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DESCRIPTORS AND CLASS INCONSISTENT

EAB512R
CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215681
\02 p150301, s150605
\03 U
\05 AIR UNIV MAXWELL AFB AL AIRPOWER RESEARCH INST
\06 Defending against a Space Blockade.
\09 CADRE paper.
\10 Blow, Tom
\11 19891200
\12 24
\14 AU-ARI-CP-89-3
\20 U
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\27 Although great attention has been paid to space weapons in relation to the Strategic Defense Initiative, there seems to be little recognition that platforms performing an SDI role could establish a space blockade. The United States must recognize the feasibility of such a blockade and take steps to offset it. Possible steps include depending on arms control pacts to keep weapons out of space, developing terrestrial systems for use in breaking a blockade, or putting weapons in space before an adversary can establish a blockade. Problems in verifying the nature of orbiting vehicles reduce the reliability of arms control. Advantages space weapons will have over surface-based systems argue against dependence on restorative measures undertaken from the ground. Thus, putting weapons in space is an option that should be explored. Perhaps the most cogent argument against this option is that using space for military ends may be destabilizing. Merely placing U.S. weapons in low orbit, even if they were deployed solely for SDI, would threaten rivals because of the possibility of a US blockade. Moreover, such platforms would be vulnerable if another power put weapons in orbit. However, a mix of low-orbit SDI forces and high-orbit reserve forces should be less vulnerable and less threatening. Such a defense could be improved by creating a high-orbit keep-out zone for each space power.
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DESCRIPTORS AND CLASS INCONSISTENT

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CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215704
\02 p050400, s150600
\03 U
\05 RAND CORP SANTA MONICA CA
\06 U.S. NATO Policy: The Next Five Years
\09 Interim rept.,
\10 Levine, Robert A
\11 19891000
\12 26
\14 RAND/N-2952-AF
\15 MDA903-85-C-0030
\20 U
4 \23
4 \24 U
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3 \27 Using a number of scenarios, this note examines variables =likely= to affect U.S. NATO policy during the first term of President George Bush's administration. The variables include both those factors introduced by the administration and the Congress, and those stemming from the world in which policymakers find themselves. The administration and the congressional leadership are dominated by pragmatic =centrists= who want to preserve NATO and who will not be anxious to initiate radical change. Therefore, major changes in NATO are not likely to be introduced by the United States. Foreign policy. (edc)
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DESCRIPTORS AND CLASS INCONSISTENT

CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215705
\02 p120500, s040200
\03 U
\05 GEOPHYSICS LAB (AFSC) HANSCOM AFB MA
\06 Observing Systems Simulation Experiments: Their Role in Meteorology.
3 \09 Environmental research papers (1988- (1989-).
\10 Lipton, Alan E.
\11 19890331
\12 19
\14 GL-TR-89-0097, AFGL-ERP 1028
\16 6670
\17 17
\20 U
4 \23
4 \24 U
\25 PE62101F, WUGL6670170B.
\26 U
3 \27 This report deals with a particular class of simulation experiments - those designed to evaluate the use of data from a given observing system in numerical weather analysis and forecasting. Simulation of data is an attractive option when evaluating a proposed observing system for which no real data are yet available, or when the experiment requires reference to atmospheric observations that can be considered perfect. This report provides an overview of the use of observing systems simulation experiments (=OSSEs=) in meteorology. We discuss the reasons that =OSSEs= have been employed. The history of =OSSE= applications is summarized, the apparent limitations of the method are listed, and future prospects of =OSSEs= are discussed. Keywords: Numerical modeling; Data assimilation. (edc)

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DESCRIPTORS AND CLASS INCONSISTENT

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4 \01 AD A215720
\02 p150600
\03 U
\05 ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS
SCHOOL OF ADVANCED MILITARY STUDIES
\06 The Cords Pacification Program: An Operational Level
Campaign Plan in Low Intensity Conflict.
\10 Macak, Richard J., Jr
\11 19890505
\12 50
\20 U
4 \23
4 \24 U
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3 \27 This paper evaluates the Civil Operations, Revolutionary
Development =Support= (CORDS) program determining whether
it represents a viable operational approach to
counterinsurgency warfare. The study specifically seeks to
understand whether the counterinsurgency concepts espoused
by the CORDS program contained major operations which were
sequenced combining tactical means to achieve political
ends. The study begins with a brief overview of today's
political realities influencing U.S. responses in the
Third World. Next, it examines the CORDS program's
historical development, organization, and implementation.
The report concludes by finding several operational
characteristics in the program's approach to the
counterinsurgency it conducted in Vietnam between <1967>
and <1972>. These operational issues include: (a) the
presence of an operational leader in the form of
Ambassador Komer; (b) an operational planning process that
balanced ends, ways, means and risk; and (c) an
operationally executed campaign that sequenced its major
operations. Keywords: Operational art; Civilian
population. (edc)
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\35 416090
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DESCRIPTORS AND CLASS INCONSISTENT

CLASSIFICATION: UNCLASSIFIED
4 \01 AD A215721
\02 p150600, s170400
\03 U
\05 ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS
SCHOOL OF ADVANCED MILITARY STUDIES
3 \06 The Operational Implications of Deception at the Battle of
=Kursk=.
\10 Elder, James E
\11 19890515
\12 55
\20 U
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3 \27 This paper analyzes German and Soviet use of deception in
the battle of =Kursk=. It uses a paradigm consisting of:
commander's aim, intelligence, centralized control,
synchronization and operations security to determine why
Soviet deception succeeded and German deception failed.
The analysis provides insights into the use of operational
deception on the modern battlefield. The study's
conclusions suggest that: <1>) operational deception is
not a separate deception activity; <2>) it can be used in
the offense or defense; <3>) it can be a viable combat
multiplier today; and <4>) deception is an acquired skill.
The study shows that operational deception must organize
and control the deception efforts at the tactical level
and that simple battlefield deception techniques can
produce an operational effect. The paper shows the
critical role commanders have in establishing an
appropriate course of action that sets the stage for
deception. The selected course of action must provide a
picture of duplicity to the enemy commander by presenting
two possible objectives. The concept of alternative
objectives allows the deception activity to flow naturally
from the COA and confuse the enemy. The report recommends
incorporation of deception into the officer corps'
professional development through professional reading
programs in schools and practical application at the
National Training Center, Combat Maneuver Training Center,
Joint Readiness Training Center and the Battle Command
Training Program. (edc)
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\40 2002
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DESCRIPTORS AND CLASS INCONSISTENT

CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215722
\02 p150600
\03 U
\05 ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS SCHOOL OF ADVANCED MILITARY STUDIES
\06 The Battle of Britain: An Analysis in Terms of Center of Gravity, Culminating Point, Fog, Friction and the Stronger Form of War.
\10 Lorenz, Oliver E.
\11 19890425
\12 50
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4 \23
4 \24 U
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3 \27 The purpose of this study is to examine whether Army operational terms apply to an air battle. The Air Force mission is to gain air supremacy and, by doing this, it indirectly supports the Army. Once air superiority is established, the Air Force directly supports the Army by air resupply and ground attack. It is important that Air Force officers understand and be able to apply the terms and ideas ground commanders will be using. Common terminology leads to common understanding and can prevent critical errors. The Battle of Britain was the first and =arguable= the only battle that was decided between opposing air elements without direct involvement of ground or naval forces. This makes the Battle of Britain the 'purest' use of air power on a grand scale. The operational terms come from the works of Clausewitz and =Jomini= and are an integral part of FM <100>-<5>, Operations. A model of 'center of gravity' is presented to help visualize the concept and explain its importance. Center of gravity will be used more and more in Army writings and plans as they become more familiar and at ease with it. Air Force officers should become familiar with and be able to apply the terms of classical warfare theory. They should be familiar with the theories not only because the Army will use them when defining their operations but because they apply to Air Force operations as well. Military doctrine terminology; Operational art. (edc)
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\40 2002
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DESCRIPTORS AND CLASS INCONSISTENT

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CLASSIFICATION: UNCLASSIFIED
4 \01 AD-A215723
\02 p050800, s150600
\03 U
\05 ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS
SCHOOL OF ADVANCED MILITARY STUDIES
\06 Personality, The Only Inherent Link for Air-Land
Synchronization at the Operational Level,
\10 Lawson, Albert P.
\11 19890508
\12 61
\20 U
4 \23
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3 \27 This study looks at the impact of personality on Air-Land
synchronization at the operational level of war. The
premise is that personality provides the only inherent
link to synchronization on operational results. The impact
of service bias, lack of joint doctrine and senior
leadership decisions contribute to establishing
preconditions for operational success or failure. Only the
impact of personality is a common factor in the
operational success of Air-Land synchronization. Other
factors complicate, if not preclude, the synchronization
of Air-Land combat operations. Lack of any other
consistent factor besides personality raises two issues--
the importance of personality and the absence of other
contributors through lack of priority within the U.S.
Armed Forces. The results and conclusions of this study
highlight the lack of joint doctrine, deep service biases,
and the use of personality to overcome these institutional
and doctrinal voids. Joint military activities/doctrine;
Leadership/military psychology. (edc)
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\35 416090
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DESCRIPTORS AND CLASS INCONSISTENT

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CLASSIFICATION UNCLASSIFIED
4 \01 AD-A215733
\02 p061500, s061100
\03 U
\05 LETTERMAN ARMY INST OF RESEARCH PRESIDIO OF SAN FRANCISCO CA
3 \06 Fourteen-Day Subacute Intravenous Toxicity Study of Hypertonic Saline/Dextran <70> and its Constituents in Beagle Dogs.
3 \09 Rept for <12> Jan-<29> Mar <89>.
\10 Zaucha, Gary M.
Frost, Densil F.
Omaye, Stanley T.
Clifford, Charles B.
Korte, Don W., Jr
\11 19891100
\12 596
\14 LAIR-404, TOXICOLOGY SER-249
\16 D836
\17 AX
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4 \24 U
\25 WUDA314428, PE63807A.
\26 U
3 \27 The subacute toxicity following intravenous administration of a proposed resuscitation fluid, hypertonic saline /Dextran <70> (HSD), was evaluated in male and female beagle dogs. Animals received intravenous doses of HSD, at levels of <12>, <16>, and <20> ml/kg/day over a <5>-minute period, daily for <14> days. Equal volumes of each HSD component, <7>.<5>% hypertonic saline (HS) and <6>% Dextran <70> (<D70>) in normal saline, were also evaluated. Ringer's lactate (RL), dosed at <20> ml/kg/day, served as the control. Blood samples were collected for serum chemistry and hematologic analyses on Day <0> (baseline), Days <1>, <2>, <3>, and <7> before daily administration of the dosing solutions, and Day <14> before necropsy. Clinical signs were observed with increased frequency in the HSD- and HS-treated groups and included disorientation, inactivity, tremors, vomiting, excessive thirst, =hunched= posture, increased salivation, increased respiratory depth or rate, and panting. The <D70>-treated animals exhibited signs with incidence intermediate to HSD- or HS'treated animals, and those treated with RL. Since the proposed therapeutic dose of HSD is a single dose of only <4> ml/kg, these findings indicate minimal adverse effects should be anticipated with the therapeutic administration of HSD. Keywords: Subacute toxicity; Intravenous administration; Hypertonic Saline; Resuscitation fluid; Dogs. (edc)
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