CONVEX FORTRAN V8.0
Release Notice

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Release Notice

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1. Introduction

This document is intended to provide users of the CONVEX FORTRAN V8.0 compiler with notice of improvements, new features, and other pertinent changes to the compiler.

The remaining sections in this document describe the following aspects of the CONVEX FORTRAN V8.0 compiler:

- Section 2 describes the software and hardware necessary to run this software.
- Section 3 describes the new features provided in this release.
- Section 4 describes changes to the documentation.
- Appendix A lists those open bugs which may result in invalid results.
- Appendix B lists the reported errors and wishes which have been "closed" in the database. This includes fixed bugs, reported bugs which were not really bugs, and wishes.
- Appendix C lists the remaining open bugs. Open wishes are not listed.

The CONVEX FORTRAN compiler is a scalar optimizing compiler (automatically performing local and global scalar optimizations), a vectorizing compiler (automatically performing vectorization of loops), and a parallelizing compiler (automatically performing parallelization of loops). CONVEX FORTRAN V8.0 will consist of the compiler driver `(fc)`, the compiler `(fskel)`, the error message file `(errmsg.fc)`, the runtime system libraries, the man pages, other FORTRAN-specific utilities, and documentation.

2. Serial numbers and prerequisites

This section discusses general information and prerequisite software and hardware for CONVEX FORTRAN V8.0.

Serial numbers

The compiler checks the serial number of the machine on which it is running. If the serial number does not match the expected one, a message is printed and execution is aborted.

Prerequisites

CONVEX FORTRAN V8.0 requires the installation of the following software:

- ConvexOS V9.1. A later release of ConvexOS is acceptable.
- CONVEX Assembler, Loader and Libraries (ALL) V2.0. A later release of CONVEX ALL is acceptable.

CONVEX FORTRAN V8.0 is compatible with the following optional program development tools:

- CONVEX CXpa V1.3 or higher
- CONVEX CXdb Debugger V2.0 or higher
- CONVEX CXmetrics V1.0 or higher

The following board revision levels are required for CONVEX FORTRAN V8.0.

Model	Board revision levels
C1 XL	n/a
C1	n/a
C210	n/a
C220 C230 C240 C32xx	VPC rev. G
C34xx C38xx	n/a

A hardware upgrade is available for machines that did not include these features as original equipment.

The following revisions of the Diagnostic Database are recommended for CONVEX FORTRAN V8.0.

Model	Diagnostic Database revision levels
C1	V1.15 or higher
C210, C220, C230, C240, C32xx	V3.5 or higher
C34xx, C38xx	n/a

These versions of the Diagnostic Databases ensure that the `ATAN` instruction will produce the same results as the `ATAN` library routine (more accurate than older versions).

3. New Features

This section lists new features included in CONVEX FORTRAN V8.0.

Fortran 90 support

The Fortran 90 support introduced in CONVEX FORTRAN V7.0 has been extended to include masked array assignments (via the WHERE statement and construct) and two new array manipulation intrinsics. All supported Fortran 90 features can be accessed through use of the `-f90` compiler option.

Masked array assignments

When the `-f90` compiler option is specified, CONVEX FORTRAN allows assignment of values to an array under a mask specified via the WHERE statement or WHERE construct. The WHERE statement evaluates a logical expression to determine to which elements the assignment is being applied. The WHERE construct works similarly, but is terminated with the ENDWHERE statement. It can contain several assignments and an ELSEWHERE statement, which allows alternate assignments to be applied to the complement of the mask-expression.

The WHERE statement has the following form:

WHERE (*mask-expr*) *assignment-stmt*

The WHERE construct has the following form:

WHERE (*mask-expr*)

[*assignment-stmt*]

[...]

[ELSEWHERE

[*assignment-stmt*]

[...]]

ENDWHERE

where

mask-expr
is a logical expression of the same shape as the array(s) being manipulated in the *assignment-stmt(s)*.

assignment-stmt
is an array assignment. The array must be the same shape as the array in *mask-expr*. If a function is used here, any array arguments it takes must also be of the same shape.

On execution, the *mask-expr* is evaluated. Any following assignments are executed only on array elements corresponding to those elements for which *mask-expr* evaluated to If an `ELSEWHERE` statement is present, its assignments are applied to array elements corresponding to those elements for which *mask-expr* evaluated to

In the `WHERE` construct, *mask-expr* is evaluated once at the beginning of the construct and the result stored for use in every *assignment-stmt*. Execution of the construct then proceeds as if each *assignment-stmt* was part of a `WHERE` statement using the original evaluation of *mask-expr*. In other words, it doesn't matter if execution of an *assignment-stmt* would change the outcome of *mask-expr*; the original evaluation of *mask-expr* is still used.

Supported Fortran 90 array intrinsics

CONVEX FORTRAN V8.0 adds support for the following Fortran 90 array manipulation intrinsics.

Intrinsic	Purpose
`EOSHIFT`	End-off shift
`CSHIFT`	Circular shift

Those Fortran 90 intrinsics supported in CONVEX FORTRAN V7.0 are, of course, still supported.

Private directives

CONVEX FORTRAN V8.0 supports two new compiler directives that allow you to increase optimization opportunities by declaring variables and arrays private to loops and tasks. The compiler assumes that private variables have no dependencies (refer to the CONVEX FORTRAN Optimization Guide for more information on dependencies). No starting or ending values can be assumed for private variables.

Only variables and statically-sized arrays can be declared private. Dynamic, allocatable, and automatic arrays are not allowed. Declaring induction variables private will yield wrong answers.

Declaring COMMON variables private is allowed, but local copies of the COMMON variables will be made and used within the loop or task list. Routines called from within the loop or task list that access these COMMON variables will be accessing the actual COMMON variables, not the local private copies.

The private directives are DO_PRIVATE and TASK_PRIVATE.

DO_PRIVATE directive

The DO_PRIVATE directive declares a list of variables and/or arrays private to the immediately following DO loop. The compiler assumes that variables declared DO_PRIVATE have no loop-carried dependencies. No starting or ending values can be assumed for these variables.

The DO_PRIVATE directive has the following form:

C$DIR DO_PRIVATE (*varlist*)

where

varlist
is a list of variables or arrays, separated by commas, that are to be private to the immediately following loop.

TASK_PRIVATE directive

The TASK_PRIVATE directive declares a list of variables and/or arrays private to the immediately following task. A task is a sequence of linear code that can be executed in parallel with other tasks. In CONVEX FORTRAN, tasks are defined using the BEGIN_TASKS, NEXT_TASK, and END_TASKS directives. The TASK_PRIVATE directive must immediately precede or appear on the same line as the BEGIN_TASKS directive. The compiler assumes that variables declared TASK_PRIVATE have no dependencies between the following tasks; therefore no starting or ending value can be assumed for the task-private variable within a task.

The TASK_PRIVATE directive has the following form:

C$DIR TASK_PRIVATE (*varlist*)

where

varlist
is a list of variables or arrays, separated by commas, that are to be private to each following task. The following tasks are defined by a BEGIN_TASKS directive and one or more NEXT_TASK directives. The scope of the task-private variables is terminated along with the task list when an END_TASKS directive is encountered.

For more information on the BEGIN_TASKS, NEXT_TASK, and END_TASKS directives, refer to the CONVEX FORTRAN Optimization Guide.

Cray word pointer arithmetic

The new -cfcwpa option causes the compiler to compute word addresses when performing Cray pointer arithmetic on explicitly declared Cray pointers. Byte addresses are still computed on pointers not explicitly declared using the POINTER statement. Attempting to perform an operation other than addition or subtraction on a declared Cray pointer under this option will cause the compiler to issue a warning message. -cfcwpa must be used with the -cfc option.

`Pointer` statement

The `POINTER` statement allows you to declare one or more pointer variables, and to define their pointees. A pointer is a four-byte variable that contains the address of another variable, array, or other storage. The pointee is used to reference the storage pointed to by the pointer variable. CONVEX FORTRAN V7.0 supported an identical implementation of the `POINTER` statement under the `-cfc` option; now this option need not be specified to enable the use of Cray-style pointers.

The `POINTER` statement has the following form:

`POINTER` (*p,s*)

where

p
: is the pointer being declared; it will hold an address. *p* must be a variable, and should be of type integer. Constants, arrays, statement functions, and external functions cannot be used.

s
: is the pointee corresponding to *p*. References to *s* will reference the storage whose address is contained in *p*. *s* cannot be a pointer. *s* cannot be associated with any other known piece of named and referenced storage except through assignments to *p* or by associating two or more pointees with one pointer. *s* cannot be of type `CHARACTER`.

For purposes of arithmetic and data type conversions, the same rules that apply to variables of type `INTEGER*4` apply to pointers. Converting pointers to non-integer types should be avoided. Performing division and multiplication on pointers should also be avoided.

A pointer can be passed into a subprogram as long as it is declared as a pointer in the subprogram.

Cross-referencer enhancements

`fcxref`, the CONVEX FORTRAN cross-referencer, has been enhanced to generate module-interface reports. These reports provide information on each module's location, type and arguments. The `-xrm` *n* flag allows you to specify the desired module interface information according to the values of *n* as shown below.

n	Report
0	No module information
1	Show module call header information
2	Show module call mismatch information
3	Show both header and mismatch information

`-xrm` can be specified on either the `fc` or `fcxref` command line.

In absence of the `-xrm` flag, the module interface report contains both header and mismatch information by default (`-xrm 3`). To exclude module interface reports you must specify `-xrm 0` when you generate the cross-referencer report.

`-except` options

The `-except` options concern the treatment of arithmetic exceptions issued by subprograms. They are `-except precise` and `-except default`.

The `-except precise` option generates code that ensures that any arithmetic exceptions issued by a subprogram before it returns will be received by the subprogram. Without `-except precise`, there is a small possibility that the location of an arithmetic exception might be reported incorrectly or lost.

The code generated under `-except precise` is specific to the target architecture for which you are compiling and is only guaranteed to work for that architecture. The target architecture is determined by the `-tm` option, or, in absence of `-tm`, defaults to the machine on which you are compiling.

Use `-except precise` only when absolutely necessary as it causes additional instructions to be inserted before every return, and this will degrade performance.

`-except default` cancels the effects of `-except precise`. This is provided mainly for overriding an `-except precise` supplied in the `OPTIONS` statement.

CXmetrics support

CONVEX CXmetrics is an optional X-window-based tool that provides analytical data about the relative complexity of C and FORTRAN programs. These data, called software metrics, consist of numerical quantities that measure particular characteristics of a program. Using software metrics can help you reduce complexity and improve quality in your programs.

CXmetrics can be run on CONVEX FORTRAN V8.0 programs when the `-metrics` option is specified on the compiler command line. `-metrics` writes the CXmetrics data file *sourcefile.met*, where *sourcefile* is the name of your original FORTRAN source file without the `.f` or `.FOR` extension, in the same directory as the source file. This human-readable ASCII file is used by CXmetrics to generate reports containing analytical data about the relative complexity of the program. Refer to the CONVEX CXmetrics User's Guide or to the metrics(1) man page for more information. CXmetrics is an optional product.

Optimization report enhancements

The optimization report has been enhanced to provide more complete information in a more logical fashion for CONVEX FORTRAN V8.0. The following enhancements have been made:

- Transformation optimizations (loop distribution, peeling, and promotion, and dynamic selection) are now marked with an asterisk.
- Dynamic selection is now clearly labeled as such and allocated a separate line like the other transformation optimizations.
- Loops are now assigned ID numbers, which are indicated in a column of the report and which can be referenced in other parts of the report.
- ID numbers of loops created by the compiler are reported in a separate column on the same line as the loops from which they were created.
- Long variable names are truncated, footnoted and expanded in a separate table instead of simply truncated.

List directed I/O changes

List directed output will always contain a leading blank, as required by the ANSI FORTRAN77 standard.

Previous releases of CONVEX FORTRAN did not exhibit this behavior.

Optimizer changes

The compiler will be more selective when vectorizing loops with a compile time determinable trip count. Depending on the complexity of the loop, some loops will no longer vectorize when the compiler determines it is not profitable to do so.

Listing option changes

The `-pl` option is now used to control the page length for listings generated by the `-LST` and `-LSTI` options, as well as the listings produced by the various cross-reference options.

Users whose printer only supports approximately 80 columns or less, and which also "wraps" longer lines (taking up an extra line on the page), may wish to specify a shorter page length, to leave room for those wrapped lines.

Summary of new options

The following table contains a summary of the new options available in CONVEX FORTRAN V8.0.

Option	Purpose
`-cfcwpa`	Compute word addresses when performing Cray pointer arithmetic on explicitly declared Cray pointers
`-except precise`	Ensures that any arithmetic exceptions issued by a subprogram before it returns will be received by the subprogram
`-except default`	Cancel `-except precise`
`-metrics`	Generate CXmetrics data file
`-xrm` *n*	Control caller/callee matching reports
`-errnames`	Forces all error, warning, and advisory messages issued by the compiler to include the messages "name". This name may be used to look up the error in Appendix C of the CONVEX FORTRAN User's Guide, where many of the common errors are described in more detail.

Unsupported directives

The following directives, which were supported in previous versions of CONVEX FORTRAN, are no longer supported:

- `ASSIGN_LOCK, FREE_LOCK`
- `BEGIN_ORDER, END_ORDER`
- `BEGIN_SECTION, END_SECTION`

The compiler issues an advisory when it encounters any of these directives.

4. Documentation changes

The documentation set supplied with CONVEX FORTRAN V8.0 has been extensively revised and reformatted. The CONVEX FORTRAN Guide has been split into the two books it previously contained as Parts 1 and 2, namely the User's Guide and the Language Reference Manual. The Man Pages, which formerly appeared in Part 3 of the Guide, are now included as an appendix of the User's Guide.

The Language Reference Manual has been reorganized to present material in a more logical order. Non-reference compiler usage information has been moved to the User's Guide.

The Optimization Guide has also been reorganized to a lesser extent.

All three books have been thoroughly re-indexed to make topics easier to locate.

The following table enumerates the new CONVEX FORTRAN V8.0 documentation set.

FORTRAN compiler documentation		
Order number	Part number	Description
DSW-038	720-000030-211	CONVEX FORTRAN User's Guide, Tenth Edition
DSW-037	720-002230-007	CONVEX FORTRAN Language Reference Manual, Tenth Edition
DSW-039	720-002430-003	CONVEX FORTRAN Quick Reference, Third Edition
DSW-034	720-000930-205	CONVEX FORTRAN Optimization Guide, Fourth Edition
DSW-043	720-005830-000	CONVEX Interlanguage Programming Guide, First Edition
*	720-001930-017	CONVEX FORTRAN V8.0 Installation Procedures
*	720-001830-017	CONVEX FORTRAN V8.0 Release Notice

* Installation Procedures and Release Notices do not have order numbers.

Appendix A

Compiler problems which produce invalid results

This appendix includes sample source code or a concise description for compiler problems that are known to produce invalid results.

****

X_ID = 24323 , pr_id = 25570

An ENTRY stmt following a SUBROUTINE or FUNCTION statement, where an ADJUSTABLE array is passed into the routine, but not declared until after the ENTRY statement, will cause invalid results or other failures.
Moving the entry statement below the array declaration fixes the problem.

```
subroutine testsub(a,og)
entry testentry(a,og)
integer og, i, j
real a(og,*),x
...
return
end
```

****

X_ID = 26855 , pr_id = 28842
X_ID = 21916, , pr_id = 22844

Using a NO_RECURRENCE directive on a loop containing subroutine calls can lead to erroneous values being passed to the subroutine.

Appendix B

Fixed bugs

This section lists:

- Bugs which have been fixed
- Reported bugs which were not really bugs
- Wishes which have either been implemented, or are unlikely to ever be implemented.

The (P) column will contain a "P" if this bug or wish was actually resolved in a previous release of the FORTRAN compiler, but not indicated as such in the release notice for that release.

CPU #	PR #	X #	(P)	Symptom of fixed problem
7	12640	13564	P	Run-time library problem
7	14672	14979		Executable terminates abnormally
11	14263	14637	P	Compiler accepts invalid program
30	10102	11840	P	Loader interface problem
33	8608	10442	P	Enhancement request
33	9704	11289	P	Compiler generates incorrect message
44	25313	24054		Miscellaneous
93	27337	25717		Documentation error
95	6053	8442	P	Compiler terminates abnormally
104	3631	7635		Run-time library problem
109	11472	11861	P	Compiler terminates abnormally
109	17501	17486	P	Miscellaneous
109	17624	17581	P	Miscellaneous
109	17638	17597		Executable generates wrong answers
109	22397	21687	P	Profiler interface problem
109	22682	21816	P	Compiler terminates abnormally
109	22706	21828	P	Compiler terminates abnormally
109	22706	21829		Compiler terminates abnormally
109	26356	22913		Miscellaneous
109	24233	23124		Compiler terminates abnormally
109	24069	23307	P	Compiler terminates abnormally
109	25096	23909	P	Compiler terminates abnormally
109	25871	24511		Miscellaneous
109	26155	24787		Compiler terminates abnormally
109	27003	25418		Miscellaneous
109	28821	26837	P	Compiler terminates abnormally
116	27466	25688		Compiler terminates abnormally
118	11585	10247	P	Input/output problem
118	17204	17238	P	Compiler terminates abnormally
133	10462	11919	P	FORTRAN source utilities
133	11352	12636	P	Executable generates wrong answers
133	25002	23789	P	Compiler terminates abnormally
147	2807	5192	P	Compiler accepts invalid program
147	5474	8030	P	Compiler accepts invalid program

CPU #	PR #	X #	(P)	Symptom of fixed problem
147	5829	8280		Compiler terminates abnormally
147	6702	8938	P	Executable terminates abnormally
147	7630	9703	P	Enhancement request
147	10157	11669		Compiler directive ignored
147	10443	11840	P	Loader interface problem
147	12586	11907	P	FORTRAN source utilities
147	11665	11919	P	FORTRAN source utilities
147	10639	12194		Compiler generates incorrect message
147	11565	12792	P	Enhancement request
147	12505	13485	P	Run-time library problem
147	13130	13836		Documentation error
147	13438	14054	P	No optimization performed
147	14791	15074	P	Loader interface problem
147	14851	15131	P	Documentation error
147	17969	17871	P	Documentation error
147	18038	17929	P	Run-time library problem
147	19403	19097	P	Source debugger interface problem
147	20233	19809	P	Source debugger interface problem
147	20486	20024	P	Miscellaneous
147	22235	21455	P	Source debugger interface problem
147	23250	22255	P	Compiler terminates abnormally
147	23476	22436		Installation procedures problem
167	22324	21542	P	Long compile time
167	25177	23948		Compiler terminates abnormally
167	27781	26052		Long compile time
177	7650	10051	P	Installation procedures problem
178	10461	11907	P	FORTRAN source utilities
187	26747	25363		Compiler terminates abnormally
187	27241	25625		Compiler terminates abnormally
193	19053	18756	P	Executable generates wrong answers
193	25094	23868		Compiler terminates abnormally
193	25081	23886		Executable generates wrong answers
198	20333	19891	P	Compiler terminates abnormally
198	26775	25309		Compiler terminates abnormally
202	8308	10247	P	Input/output problem
202	16977	17074	P	Long compile time
202	17530	17519	P	Documentation error
202	22268	21513	P	Man page error
209	10211	11861	P	Compiler terminates abnormally
209	21601	11919	P	FORTRAN source utilities
209	15277	15532	P	Documentation error
209	20485	20024	P	Miscellaneous
209	22632	21787		Documentation error
223	12203	11907	P	FORTRAN source utilities
223	20868	16922	P	Executable generates wrong answers
223	18044	17519	P	Documentation error
223	19067	18785	P	Man page error
223	20483	20000	P	Executable terminates abnormally
223	20624	20157	P	Enhancement request
223	21058	20500	P	Compiler terminates abnormally
223	21682	21029	P	Compiler terminates abnormally

CPU #	PR #	X #	(P)	Symptom of fixed problem
223	23162	21687	P	Profiler interface problem
223	17655	21818	P	Compiler terminates abnormally
223	22677	21861	P	Compiler terminates abnormally
223	23872	22814	P	Installation procedures problem
223	24618	23456		Executable generates wrong answers
223	26279	24872		Long compile time
223	27816	26096		Compiler terminates abnormally
225	22513	21682		Man page error
225	22515	21683		Documentation error
228	15517	15563	P	Compiler terminates abnormally
228	17183	17251	P	Installation procedures problem
228	18123	17871	P	Documentation error
228	18122	18056	P	Miscellaneous
228	19945	19588	P	Enhancement request
228	21102	20535	P	Compiler directive ignored
228	23991	22917	P	Executable terminates abnormally
228	25378	24094		Compiler terminates abnormally
228	25159	24467	P	Executable terminates abnormally
228	26218	24844		Compiler terminates abnormally
228	26388	24966		Executable generates wrong answers
228	27345	25737		Compiler terminates abnormally
228	27398	25799	P	Compiler terminates abnormally
228	28112	26307	P	Enhancement request
236	14882	15162	P	FORTRAN source utilities
270	10459	11907	P	FORTRAN source utilities
290	8752	10531	P	Enhancement request
8201	13596	14164	P	Profiler interface problem
8201	13836	14398	P	Compiler terminates abnormally
8201	14737	15013	P	Documentation error
8201	14738	15017	P	Documentation error
8201	14743	15020	P	Input/output problem
8201	14904	15189	P	Documentation error
8201	15021	15355	P	Documentation error
8201	15852	15532	P	Documentation error
8201	16001	16224	P	Documentation error
8201	16262	16428	P	Enhancement request
8201	18098	18061		Documentation error
8201	19837	19493	P	Documentation error
8201	20954	20408	P	Installation procedures problem
8201	20961	20413	P	Documentation error
8201	21445	20816		Compiler terminates abnormally
8201	22247	21465	P	Run-time library problem
8201	22759	21887		Man page error
8201	23003	22080	P	Profiler interface problem
8201	23093	22181		Compiler terminates abnormally
8201	23207	22234	P	Loader interface problem
8201	23330	22299		Compiler rejects valid program
8201	23377	22333		Compiler terminates abnormally
8201	23452	22420		Miscellaneous
8201	23521	22481		Executable generates wrong answers
8201	23947	22887		Documentation error

CPU #	PR #	X #	(P)	Symptom of fixed problem
8201	23986	22913		Miscellaneous
8201	24008	22924		Documentation error
8201	24478	23322		Documentation error
8201	24612	23457	P	Executable generates wrong answers
8201	24765	23612		No optimization performed
8201	24895	23697		Documentation error
8201	24896	23698	P	Documentation error
8201	24897	23699		Documentation error
8201	24899	23701		Miscellaneous
8201	24948	23754		Miscellaneous
8201	25019	23799		Miscellaneous
8201	25960	24600		Miscellaneous
8201	25961	24601		Miscellaneous
8201	26156	24786		Documentation error
8201	26788	25258		Profiler interface problem
8222	20801	20382	P	Executable generates wrong answers
8233	23388	22365		Long compile time
8234	22727	21847	P	Executable generates wrong answers
8237	11668	12878	P	Compiler generates incorrect message
8240	16955	17032	P	Compiler terminates abnormally
8240	27232	25594	P	Compiler terminates abnormally
8243	21388	20768	P	Compiler generates incorrect message
8243	22131	21360		Miscellaneous
8243	22172	21401		Miscellaneous
8243	25605	24489		Installation procedures problem
8244	10262	10247	P	Input/output problem
8247	9293	11919	P	FORTRAN source utilities
8249	11334	12606	P	Compiler generates incorrect message
8251	11275	12572	P	Compiler terminates abnormally
8259	13147	13857		Compiler generates incorrect message
8259	13664	14338		Compiler terminates abnormally
8259	14734	15028	P	Documentation error
8259	15313	15563	P	Compiler terminates abnormally
8259	15515	15751	P	Enhancement request
8259	17475	17412	P	Profiler interface problem
8259	18287	18161	P	Enhancement request
8259	18434	18257	P	Documentation error
8259	18435	18258	P	Documentation error
8259	21987	21248		Compiler terminates abnormally
8259	22051	21289	P	Enhancement request
8259	22329	21541	P	Compiler terminates abnormally
8259	22695	21839	P	Executable terminates abnormally
8259	22754	22038		Documentation error
8259	24059	22989		Compiler terminates abnormally
8259	24750	23620		Documentation error
8259	25731	24417		Compiler terminates abnormally
8259	25795	24452		Compiler terminates abnormally
8259	25906	24547	P	Executable terminates abnormally
8259	26122	24773		Compiler terminates abnormally
8259	26362	24945	P	Compiler terminates abnormally
8259	26830	25307		Executable generates wrong answers

CPU #	PR #	X #	(P)	Symptom of fixed problem
8259	27974	26210	P	Compiler terminates abnormally
8259	27961	26211	P	Compiler terminates abnormally
8259	28394	26496		Documentation error
8259	28466	26558		Compiler terminates abnormally
8274	26416	24975		Executable terminates abnormally
8284	14989	15261	P	Compiler terminates abnormally
8284	15149	15438	P	Compiler generates incorrect message
8286	24974	23774		Compiler terminates abnormally
8286	24975	23775		Compiler rejects valid program
8296	13810	11907	P	FORTRAN source utilities
8298	14619	14925	P	Compiler generates incorrect message
8298	14622	14926	P	Enhancement request
8329	17970	17916	P	Executable generates wrong answers
8333	23403	22378	P	Miscellaneous
8333	24852	23668		Compiler terminates abnormally
8333	26294	25130		Documentation error
8333	26718	25368	P	Enhancement request
8341	20612	14925	P	Compiler generates incorrect message
8341	16717	16856		Compiler terminates abnormally
8351	21429	14637	P	Compiler accepts invalid program
8351	22396	21656	P	Compiler terminates abnormally
8351	23156	22178		Compiler terminates abnormally
8351	23157	22179		Executable terminates abnormally
8354	16797	16922	P	Executable generates wrong answers
8355	16814	16928	P	Compiler terminates abnormally
8359	14360	14698	P	Enhancement request
8382	12745	11840	P	Loader interface problem
8401	14713	14637	P	Compiler accepts invalid program
8401	14282	14651	P	Compiler generates incorrect message
8401	15364	15605	P	Compiler terminates abnormally
8401	15426	15667	P	Documentation error
8401	15648	15876	P	Enhancement request
8401	15801	16037	P	Source debugger interface problem
8401	16756	16880	P	Documentation error
8401	16932	17016	P	Documentation error
8401	17025	17096	P	Documentation error
8401	17157	17244	P	Documentation error
8401	17862	17796	P	Miscellaneous
8401	18120	17978		Documentation error
8401	18118	17979	P	Documentation error
8401	18237	18075	P	Man page error
8401	18238	18076	P	Documentation error
8401	18620	18457		Documentation error
8401	18701	18468	P	Executable terminates abnormally
8401	19042	18765	P	Enhancement request
8401	19377	19074	P	Man page error
8401	19957	19562	P	Executable generates wrong answers
8401	19934	19628	P	Man page error
8401	20464	20000	P	Executable terminates abnormally
8401	20707	20212	P	No optimization performed
8401	20749	20256	P	Compiler generates incorrect message

CPU #	PR #	X #	(P)	Symptom of fixed problem
8401	20749	20278	P	Documentation error
8401	21167	20569		Man page error
8401	21559	20897	P	Compiler terminates abnormally
8401	22320	21540	P	Compiler terminates abnormally
8401	22429	21620	P	Compiler terminates abnormally
8401	22625	21762		Documentation error
8401	22626	21763		Man page error
8401	22772	21869	P	Compiler terminates abnormally
8401	22812	21894		Documentation error
8401	22920	21976	P	Enhancement request
8401	23021	22091		Compiler rejects valid program
8401	23441	22403		Compiler terminates abnormally
8401	23616	22593		Compiler terminates abnormally
8401	23695	22675		Documentation error
8401	23810	22808		Executable terminates abnormally
8401	24973	23773		Compiler terminates abnormally
8401	24863	23841		Documentation error
8401	24863	23842		Documentation error
8401	24863	23844		Documentation error
8401	24863	23846		Documentation error
8401	25077	23854		Compiler generates incorrect message
8401	25758	24413		Documentation error
8401	25777	24432	P	Compiler terminates abnormally
8401	25856	24487		Documentation error
8401	26664	25146		Compiler terminates abnormally
8401	26666	25147		Compiler terminates abnormally
8401	26863	25327		Man page error
8401	27406	25782		Installation procedures problem
8401	27679	25970		Documentation error
8401	28322	26438		Documentation error
8401	28323	26443		Man page error
8401	28353	26482		Documentation error
8401	28853	26856	P	Compiler terminates abnormally
8409	28474	26569		Compiler terminates abnormally
8413	13869	11907	P	FORTRAN source utilities
8417	17343	17412	P	Profiler interface problem
8438	13924	14406	P	No optimization performed
8447	21800	15261	P	Compiler terminates abnormally
8447	17618	17575	P	Miscellaneous
8447	21624	21003	P	No optimization performed
8447	21636	21009	P	FORTRAN source utilities
8447	22718	21858		Long compile time
8447	22737	21859		Compiler terminates abnormally
8480	26522	25094		Documentation error
8522	21171	20578		Enhancement request
8522	28356	26481		Enhancement request
8522	28356	26483		Man page error
8525	28053	26277		Compiler terminates abnormally
8529	26094	24748		Man page error
8530	24002	22993	P	Installation procedures problem
8532	26179	24825		Compiler terminates abnormally

CPU #	PR #	X #	(P)	Symptom of fixed problem
8534	14403	11861	P	Compiler terminates abnormally
8534	18401	18180	P	Source debugger interface problem
8534	19249	18942	P	Miscellaneous
8534	19510	19211	P	Man page error
8534	19879	19506	P	Source debugger interface problem
8534	20149	19734	P	Source debugger interface problem
8534	22215	21506	P	Man page error
8534	26394	24967	P	Executable generates wrong answers
8534	28162	26338		Source debugger interface problem
8537	19941	14979		Executable terminates abnormally
8537	22317	21670	P	Executable generates wrong answers
8548	18072	17941	P	Executable generates wrong answers
8548	17975	18276	P	Executable terminates abnormally
8572	16901	16977	P	Documentation error
8572	16902	16978	P	Documentation error
8572	18593	18384	P	Documentation error
8572	21831	21106	P	Installation procedures problem
8572	21832	21113	P	Installation procedures problem
8572	23427	22388		Miscellaneous
8572	23428	22389		Miscellaneous
8572	23429	22391	P	Documentation error
8572	23432	22393		Miscellaneous
8572	23433	22394		Documentation error
8572	23453	22421		Documentation error
8572	23489	22445		Documentation error
8572	23496	22451		Documentation error
8572	23498	22454		Documentation error
8572	23750	22706		Compiler terminates abnormally
8572	23895	22827		Compiler terminates abnormally
8572	24161	23066		VMS FORTRAN incompatibility
8572	24171	23071		Compiler generates incorrect message
8572	24898	23700		Miscellaneous
8572	25163	23968		FORTRAN source utilities
8572	25167	23970		Compiler generates incorrect message
8572	25315	24055		Miscellaneous
8572	26483	25007		Documentation error
8572	26461	25014		Installation procedures problem
8572	26773	25255		Compiler generates incorrect message
8600	24128	23201		VMS FORTRAN incompatibility
8605	17972	17896	P	Run-time library problem
8605	17973	17902	P	Run-time library problem
8605	19363	19072	P	Compiler terminates abnormally
8605	22214	21461	P	No optimization performed
8605	22708	21835	P	Executable generates wrong answers
8605	25047	24667		Compiler terminates abnormally
8605	28346	26791	P	Compiler terminates abnormally
8605	29168	26837	P	Compiler terminates abnormally
8644	27028	24773		Compiler terminates abnormally
8690	22571	21723	P	Compiler terminates abnormally
8692	23620	22606	P	Executable generates wrong answers
8692	24931	23749	P	Executable generates wrong answers

CPU #	PR #	X #	(P)	Symptom of fixed problem
8692	26420	24985		Compiler terminates abnormally
16389	11929	13086	P	Compiler terminates abnormally
16397	24029	22963		Compiler terminates abnormally
16397	24031	22973		Compiler terminates abnormally
16397	24032	22975		Compiler terminates abnormally
16401	22046	21271		Enhancement request
16401	22044	21508	P	Enhancement request
16401	24334	23201		VMS FORTRAN incompatibility
16403	24654	23487	P	Compiler terminates abnormally
16406	23425	23093		Executable terminates abnormally
16406	24241	23175		Documentation error
16408	22433	21640	P	FORTRAN source utilities
16430	21289	15261	P	Compiler terminates abnormally
16431	27213	25583		Compiler generates incorrect message
16444	24487	23363		Documentation error
16446	21602	20933	P	FORTRAN source utilities
16446	22242	21462	P	FORTRAN source utilities
16455	17018	17176	P	Documentation error
16455	21165	20668	P	Compiler terminates abnormally
16455	23378	22348		Documentation error
16455	23378	22349		Documentation error
16455	23378	22352		Documentation error
16456	17736	17688	P	Compiler terminates abnormally
16462	19736	19465	P	FORTRAN source utilities
16462	20771	20256	P	Compiler generates incorrect message
16471	22386	14637	P	Compiler accepts invalid program
16502	22380	21612		Enhancement request
16517	27281	25698		Compiler generates incorrect message
16524	27122	25651		Compiler terminates abnormally
16524	28320	26468		Documentation error
16524	28644	26684		Compiler terminates abnormally
16528	26757	26609		Executable generates wrong answers
16531	27404	25780		Miscellaneous
16531	28345	26476		Installation procedures problem
28682	27177	25688		Compiler terminates abnormally
28717	28089	26341		Compiler terminates abnormally
32771	20489	20045	P	Compiler generates incorrect message
32793	27108	25492		Compiler terminates abnormally
41006	24849	23674		Miscellaneous
41006	25111	24276		No optimization performed
41006	27966	26241	P	Compiler generates incorrect message
41007	26755	25409		Executable terminates abnormally
41009	25590	24302		Executable generates wrong answers
41011	28862	26880		Compiler terminates abnormally
41012	26401	25240	P	No optimization performed
41016	27103	25523		No optimization performed
41019	27855	26128		Compiler terminates abnormally
41029	27586	25973		Executable generates wrong answers
41029	28765	26783		Source debugger interface problem

Appendix C

Open bugs

This section lists bugs which have not been fixed in this release.

CPU #	PR #	X #	Symptom of known software problem
51	15116	15396	Compiler generates incorrect message
109	27625	25250	Long compile time
109	28564	26650	Input/output problem
118	17876	17795	Compiler rejects valid program
190	21743	21672	Executable terminates abnormally
209	22730	21865	Compiler rejects valid program
228	27662	25993	Input/output problem
228	28700	26739	Compiler generates incorrect message
8201	23178	22201	VMS FORTRAN incompatibility
8259	28760	26788	Loader interface problem
8401	29074	26997	Compiler terminates abnormally
8501	28796	26817	Compiler terminates abnormally
8522	25973	24611	Compiler generates incorrect message
8631	28840	24519	Compiler generates incorrect message
8693	28917	24611	Compiler generates incorrect message
8693	27218	25587	Compiler generates incorrect message
16406	25884	24519	Compiler generates incorrect message
16446	25643	24350	Compiler terminates abnormally
16517	27230	25599	Compiler terminates abnormally
16524	28689	26735	Compiler generates incorrect message