

Minutes of WG14/X3J11 Meeting in Hawaii

Dates: 1993-12-01/1993-12-03

Location:

Kona Hilton
75-5852 Alii Drive
Kailua-Kona HI
96740 USA

Legend:

[AGENDA X.Y] - At agenda item X.Y.
[ACTION] - An action item is recorded.
[ACTION-DONE] - A completed action item is noted.
[STRAW VOTE] - An unofficial vote.
[VOTE] - An official vote.

1993-12-01 09:00 (Wednesday Morning) -----

[AGENDA 1.1] Opening Comments

JAESCHKE will serve as chair for joint WG14/XJ311 meeting,
and
FARANCE will serve as secretary.

[AGENDA 1.2] Roll Call

WG14 Attendance: Denmark, Japan, UK, US

X3J11 Attendance:

Company	Name
Amdahl	Neal Weidenhofer
Cray Research	Tom MacDonald
DEC Professional	Rex Jaeschke
DECUS	Tony Mione
Digital Equipment	Jeffrey Zeeb
Farance Inc.	Frank Farance
Hewlett-Packard	John Kwan
IBM Corp.	Fred Tydeman (NV)
Keaton	David Keaton
Lawrence Livermore	Linda Stanberry
OSF	Michael Meissner
Perennial	John Benito
Plum Hall	Thomas Plum
SDRC	Larry Jones
Sun Microsystems (NV)	Bob Jervis
Thinking Machines	James L. Frankel
Unisys	Jonathan Ziebell
US Army	Douglas A. Gwyn

NV==Not Voting

[AGENDA 1.3] Selection of Meeting Chair

JAESCHKE will serve as chair of this meeting.

[AGENDA 1.4] Procedures for This Meeting

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WG14 and member nations will sometimes need to meet independently.

[AGENDA 1.5] Approval of Previous Minutes

Done.

[AGENDA 1.6] Review of Action Items and Resolutions

WG14 Action Items Carried Forward:

[ACTION] SIMONSEN: Comparison of POSIX and C locale mechanism.

[ACTION] FEATHER will produce Defect Report on "when size is needed."

[VOTE] No opposition to approval of minutes.

X3J11 Action Items Carried Forward:

[ACTION] GWYN agreed to provide write up on editorial changes and post it to X3J11. Work must be done by PLAUGER. Pending.

[ACTION-DONE] KEATON will provide X3J11 Rationale and Documents available via FTP: ftp.dmk.com:

Minutes approved.

[AGENDA 1.7] Approval of Agenda

Meeting Schedule

	A.M. Session	Lunch	P.M. Session
Wed.	09:00-12:00,	12:00-13:00,	13:00-17:00
Thu.	08:30-12:00,	12:00-14:00,	14:00-17:30
Fri.	08:30-12:00,	12:00-13:30,	13:30-17:00

WG14 Fri. 12:00 meeting

US TAG Wed. 17:00-17:30, Fri. 08:00-08:30

Revised Agenda:

1. Opening Activities

- 1.1 Opening Comments
- 1.2 Introduction of Participants/Roll Call
- 1.3 Selection of Meeting Chair
- 1.4 Procedures for this Meeting
- 1.5 Approval of Previous Minutes (WG14/N285)
- 1.6 Review of Action Items and Resolutions
- 1.7 Approval of Agenda (WG14/N286)
- 1.8 Distribution of New Documents
- 1.9 Information on Next Meeting (WG14/N293,

WG14/N294)

2. Reports on Liaison Activities

- 2.1 X3J11
- 2.2 X3J11.1 (NCEG)
- 2.3 X3J16/WG21
- 2.4 WG15
- 2.5 WG20

2.6 Other Liaison Activities: ECMA (SC22/N297)

3. Normative Addendum

3.1 Result of PDAM Balloting (K1, WG14/N300)

3.2 Preparation for Subsequent Balloting

4. Defect Reports

4.1 Result of RR and TC balloting (K1)

4.2 New Defect Reports (N295, N297, N299, K2, N291)

4.3 Handling of PDR's (DJONES E-mail)

5. Revision of ISO/IEC 9899:1990 (N298)

6. Review of X3J11.1 Technical Reports (N291, N274, N302)

6.1 Review LIA for X3J11.

7. Other Business

8. Future Meetings

8.1 Future Meeting Schedule

8.2 Future Agenda Items

8.3 Future Mailings

9. Resolutions

9.1 Review of Decisions Reached

9.2 Formal Vote on Resolutions

9.3 Review of Action Items

9.4 Thanks to Host

10. Adjournment

[AGENDA 1.8] Distribution of New Documents

Done.-

[AGENDA 1.9] Information on Next Meeting

Show of hands for future meetings.

Dates to be set later this meeting.

[AGENDA 2] Reports on Liaison Activity

[AGENDA 2.1] X3J11

- ISO committee on LIA (Language Independent Arithmetic)

- ISO GKS needs to be reviewed.

[ACTION] JAESCHKE - get resolution of LIA review.

- POSIX 1003.4A document required review prior to Hawaii meeting.

Rex sent comments with respect to C language perspective.

DJONES: ISO is shifting from language-dependent to language-independent standards.

[AGENDA 2.2] X3J11.1 (NCEG)

Documents to be reviewed.

X3J11.1 wants to disband and merge with X3J11

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X3H5 liaison - Language-Independent Task Parallelism

X3J11.1 subgroups still in progress:

- Complex Arithmetic
- Extended Integer Range
- Data Parallel
- Variable Length Array

[AGENDA 2.3] X3J16/WG21

WG21+X3J16 Liaison: PLUM

- At the San Jose meeting, there were no objections to current "digraph" proposal in MSE-addendum.
- Incompatibilities report has been published to WG14 + X3J11 in WG14/N262 = X3J11/93-008. More progress since then.

"Plain Old Data Structure (PODS)"

Layout rules presented:

- 1 - "layout-compatible" defined
- 2 - initial member rule
- 3 - common initial sequence rule
- 4 - char* & void* have same alignment and representation
- 5 - proper linkage of "extern" incomplete and complete
- 6 - alias-pun rules
- 7 - "underlying type" rule of enums allow safe conversion from int
- 8 - still working on fundamental definitions.

Met 1993-11 in San Jose

Plum reported that WG14 changed "ne" to "not_eq" as requested by WG21,

but that "%:" was not changed because all proposed alternatives were

less desirable to WG14 and because WG21 acknowledged that the problem

was "less serious" in that it already existed for the "<:" token. WG21

raised no objections to this resolution.

Compatibility between C and C++

Issues:

- "Plain Old Data Structures" (PODS)
- Layout rules for structures, unions, etc.
- Enum type is an integral type.
- 1993-11 meeting - last chance for major changes.
- The MSE (multibyte) will be incorporated by reference.
- C++ working draft should be included in some future X3J11/WG14 mailing.

[ACTION] PLUM will investigate availability of machine readable X3J16/WG21 document.

[AGENDA 2.4] WG15 (POSIX)

No new reports.

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[AGENDA 2.5] WG20 (Internationalization)

PLAUGER: WG20 produces language-independent standards.

- All programming languages will incorporate ISO 10646.
(Level 1 ISO 10646)

ISO/IEC 10646-1, Universal Multiple-Octet Coded Character Set
UCS.

Part 1: Architecture and Basic MultiLingual Plane.

[AGENDA 2.6] Other Liaison Activities

ECMA:

- Discussion of SC21 + SC22 status.
- SED 29899 - European Standard of C.

[ACTION] JAESCHKE will review SC21/WG3 ISO 10728 "C Binding
IRDS
Database"

PLAUGER: SC22 Plenary in Paris 1993-11

SC22 Discussion:

- Validation of C? SC22 is working on issue.
- Revision of C standard? Complete Defect Reports &
Amendment first,
then revise C standard if you desire. We should investigate
what we
would desire - this should be part of discussion in current
meetings.

PLAUGER: We are in compliance with ISO 10646.

[AGENDA 3] Normative Addendum

[AGENDA 3.1] Result of PDAM Balloting

(PDAM == Proposed Draft Amendment)

Probable voting of WG14 members:

Japan: No with comments. Will change to Yes if typos are
fixed and
WG14 adds the rationale that has been prepared by the
Japanese
delegation.

Netherlands: No with comments. Digraphs are problem.

UK: No with comments. Digraphs are problem.

Denmark: CORDSEN: Yes with comments.

New Zealand: Yes.

DEFER: Deferred until N300 reproduced.

1993-12-01 13:00 (Wednesday Afternoon) -----

[AGENDA 4] Defect Reports

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RR & TC

- No "No" votes
- GWYN has comments - ready tomorrow.
- FEATHER has a few comments to assemble.

DJONES

- Discussion of mechanics
- Member body: submit through national body.
- Each PDR should deal with one type of construct.
- Defect report should contain citation to the C standard.
- DJONES will send PDR document to reflector.

[ACTION] Division of work for Defect Report

GWYN N295, N297 1-8

DJONES N297 9-17

BENITO N297 18-26

MIONE N297 27-30, N299 1-5, W-25

KEATON N299 6-14

ZEEB N299 15-23

[STRAW VOTE] All problems are defect reports

In Favor: 12, Against: 1

TC = Technical Corrigendum

RR = Record of Response

NR = Not Reviewed

P = Pending

DJONES: N297 #9, #10, #11, #12, #13, #14 (FEATHER)

1993-12-01 17:00 (Wednesday Evening) -----

X3J11-only portion of meeting

- Portable Common Tool Environment (ECMA)

[ACTION] FARANCE will review document

- GKS Document
 - No takers
- P1003.4A - Real time extensions.
 - Rex has already responded.
- Development of US locale for XOpen.

GWYN & MEISSNER: U.S. XOpen rep & POSIX should be doing this.

Electronic Documents

X3 + JT documents to be sent via E-mail.

Jean-Paul Emard +1 202 626 5740

Compuserve Address: 75300.2666@compuserve.com

Phone: +1 202 737 8888

FAX: +1 202 638 4923

FAX: +1 202 628 2829

X3 Secretariat

CBEMA

1250 Eye Street NW Suite 200

Washington DC

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20005-3922 USA

Documents from X3J11

[ACTION] FARANCE will do electronic document pilot project.

- LIA - Language Independent Arithmetic

Many people have problems with LIA. Discussion on what to complain about and whether to form a group opinion. Process as a collection of individual responses.

1993-12-02 08:30 (Thursday Morning) -----

PLAUGER-COTE

N1443/ NZ & Belgium- YES, Australia - Abstain

N1445/ NZ - Yes, Australia - Abstain

[AGENDA 4] Defect Reports (continued)

GWYN: N297 #4 (FEATHER) - RR
Integer/Integral is editorial variety.
Integral is used rarely in 1-2 cases

GWYN: N297 #5 (FEATHER) - TC

Suggestion TC for clarification: add to 6.1.25:

"CHAR has same representation as {signed || unsigned}
char"

[STRAW VOTE] In favor of above wording change?
In Favor: 19, Against: 1

BENITO: N297 #18 (FEATHER) - RR

What is effect of signed shift? Standard does not say. Want
N<<1 ---- 2's complement numbers

Probably want:
N<<1 --- ceil(N/2) || floor (N/2)

Discussion:

PLAUGER: Any negative number that is shifted is undefined
[???]
behavior.

BENITO: N297 #19 (FEATHER) - RR

<stdarg.h> macros - Can they be used out of defined order ?
No, STD
is clear.

BENITO: N297 #20 (FEATHER) - TC

Subclause 7.1.7 - Want to also outlaw "incorrect" type of
unchecked

4/05

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arg, e.g., if no prototype or var args and "int" arg then "double" expected.

Suggested wording: Add: "or an incorrect type" after the words in parentheses in the second sentence on page 99.

MACDONALD: N297 #27 (FEATHER) - RR

MACDONALD: N297 #28 (FEATHER) - RR

STD does not disallow brain-dead character sets.

MACDONALD: N297 #29 (FEATHER) - TC

Change wording to clarify:

```
char x [10] = "hello"
x [9] == '\0' ; <= currently unspecified should be
defined to be NUL
```

[STRAW VOTE] No objections.

MACDONALD: N297 #30 (FEATHER) - TC
Freestanding -Deferred, no closure

MIONE: N299 #1 (GUILMETTE) - RR

Discussion of whether or not a diagnostic is required for a violation of constraint, semantics, etc.

MIONE: N299 #2 (GUILMETTE) - RR

MIONE: N299 #3 (GUILMETTE) - RR

This DR is a request for change. Currently, quality-of-implementation issue. To be changed in a future standard.

MIONE: N299 #4 (GUILMETTE) - RR

This DR is a request for change. Quality-of-implementation issue. To be changed in a future standard.

MIONE: N299 #5 (GUILMETTE) - RR

MIONE: N299 #20 (GUILMETTE) - RR
See section 6.7.1 66.4

MIONE: N299 #21 (GUILMETTE) - RR

```
char x[2][5] = "abcdef";
```

Require diagnostic? No, because six characters to initialize space for 10.

Not strictly conforming? No - it is conforming.

MIONE: N299 #22 (GUILMETTE) - RR

Is this declaration legal?

```
struct {int mbr;};
```

Much discussion about this. The STD could be read either way.

PLUM: Leave it "undefined behavior" - a program that depends (1) on an error (validation programs) or (2) not on an error (application code) "is dependent or undefined behavior".

MIONE: N299 #23 (GUILMETTE) - RR

KEATON: N299 #6 (GUILMETTE) - RR

KEATON: N299 #7 (GUILMETTE) - RR

KEATON: N299 #8 (GUILMETTE) - TC

Add wording to section 6.3.2.2 to constraint section.

Keaton: N299 #9 (GUILMETTE) - RR

```
void x( )  
struct s { int member;};  
struct s { int member;};
```

Is diagnostic required for second "struct"?

FEATHER: Careful reading of STD implies a diagnostic is required.

KEATON: N299 #10 (GUILMETTE) -

Discussion - no resolution. Deferred.

KEATON: N299 #11 (GUILMETTE) - RR

Didn't want to make change - leave as undefined behavior.

1993-12-02 14:00 (Thursday Afternoon) -----

[AGENDA 5] Revision of ISO/IEC 9899:1990

Discussion of Technical Revision to C STD.

- Soonest we could start is 1994-12 meeting.

PLAUGER: Be careful not to let the process get out of control.

FARANACE: Need to process defects, address compatibility with C++, take NCEG work as a start, new technology. Project plan (work items) is stability effect.

MEISSNER: Look at problems other standards committees experience (e.g.,

COBOL & FORTRAN).

JERVIS: Need to change. If C stays the same, then C will die. NCEG is a good start.

STANBERRY: Many users are frustrated with standards process. Users want quality standards quickly. NCEG is highly desired.

PLUM: Politics is complicated. SC22 didn't understand why two committees (WG14, WG21) are necessary if the languages are so close. C (vs. C++) is the "efficient" and "well-defined" subset of C++. C should continue to be the "well-defined" subset of C++.

PLAUGER: C could incorporate some tried and true features (e.g., Jervis' "Classes in C") efficiently, backward compatibility, prior art defect reports, look at C++ to pick and choose. Don't invent - confine to prior art.

WEIDENHOFER: Changes would cause existing vendors to lose conformance.

KWAN: Changes overburden vendors with unuseful features.

[STRAW VOTE]

"What is the sentiment for planning to revise the C STD?"

X3J11: 17 Yes, 0 No - Unanimous

WG14: 4 Yes, 0 No - Unanimous

PLAUGER: Initial deliverable should be a plan of action.

[ACTION] JAESCHKE will be a focal point for getting this organized.

E-mail: rex@aussie.com

Should collect prior to pre-J11 mailing.

[STRAW VOTE]

"In favor of JAESCHKE coordinating document for charter of new standard?"

X3J11: 18 Yes, 0 No - Unanimous

WG14: 4 Yes, 0 No - Unanimous

JERVIS will hold meeting tonight (20:00) on potential work items.

[AGENDA 4.1] Result of RR and TC Balloting

PLAUGER:
- Ballot doesn't close until next week.

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- Not aware of any substantial problems.
- After SC22 approval, 2-3 months before availability.

[STRAW VOTE]

PLAUGER empowered to draft all 9 changes and to forward R & RR and make editorial changes to respond to any No votes subject to review.

X3J11 18 Yes, 0 No

WG14 4 Yes, 0 No

[ACTION] PLAUGER (editor), FEATHER, GWYN are review committee.

[AGENDA 4.3] Handling of PDR's (Proposed Defect Report)

DJONES:

- Should only discuss one construct.
- Standards citations should be included.

PLAUGER: Willing to handle distributing the work for initial review.

PLUM: Propose PLAUGER send to two people. They get on phone to resolve problem.

GWYN: Proposal response to be provided.

[AGENDA 3] Normative Addendum

[AGENDA 3.1] Result of PDAM balloting

UK voting NO - for digraphs.

Netherlands voting NO - for digraphs.

(Separate meeting for U.S. TAG)

U.S. TAG (Technical Advisory Group)

JAESCHKE: Digraph issues are political, not technical.

GWYN: Has objected to this on technical issues. We will address this (international issues) in new STD.

FARANCE: Should separate contentious (digraph) and non-contentious (MSE).

JERVIS: Once in the standard - cannot be removed. Should stop it now.

FARANCE: We got consensus now after a lot of effort, why wouldn't we follow through?

PLUM: Bad position for U.S. to just change our mind now after 5 years.

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FARANACE: Shouldn't be a surprise that we've changed our mind because we've been forced to vote jointly. Had they been split from the beginning, we would have found that there was little support 4 years ago.

WEIDENHOFER: Felt we've been asked to support this because the Europeans want this.

19 Voting Members

Motion: "US for Yes for Addendum"

GWYN/MEISSNER

11 yes, 5 no, 0 abstain, 3 not present
Passed - 2/3 voting rule

(Return to WG14/X3J11 meeting)

DK - CORDSEN

JP - NODA

UK - DJONES

US - BENITO

[AGENDA 3.2] Preparation for Subsequent Balloting

[VOTE]

PLAUGER: Request resolution to empower PLAUGER to proceed with processing the amendments.

DK: Yes

JP: Yes

UK: Abstain

US: Yes

Reviewers: FEATHER, MEISSNER, NODA

[AGENDA 4.2] Defect Reports (continued)

ZEEB N299 #15 (GUILMETTE) - RR

ZEEB N299 #16 (GUILMETTE) - RR

Distinguishing undefined values and undefined behavior.

LJONES: "Value is undefined" can be considered a subset of undefined behavior.

Part 1: Keep it as specified.

Part 2: ?

ZEEB N299 #17 (GUILMETTE) - RR

ZEEB N299 #18 (GUILMETTE) - RR

ZEEB N297 #19 (GUILMETTE) - RR

DJONES N297 #15A (GUILMETTE) - RR

DJONES N297 #15B (GUILMETTE) - RR

DJONES N297 #15C (GUILMETTE) - RR

DJONES N297 #15D (GUILMETTE) - RR

1993-12-02 20:00 (Thursday Evening) -----

Brainstorming Session on New For STD Revision

Meeting chaired by JERVIS

In Favor	Against	Concept
9	2	IEEE FP
9	4	Restrict
10	6	Complex
8	3	VLA
14	1	Compound literals/designated int
6	3	Data parallel (DPCE)
14	1	Extended int range
9	4	Classes in C
10	5	Overloading
12	3	In-line
9	1	Char set improvements
3	8	Exception handling
5	4	LIA/CLID (WG11)
9	3	Range types
13	2	Strong enums
15	1	Remove default int
14	3	Remove obsolete features
7	3	Bit length
10	1	Library clean up
3	6	Debugging support
8	1	Better stdio (Chris Torek)
3	3	ISO 10646
17	2	C++ compatibility
5	3	Zero size object
4	0	POSIX locale definition
6	6	X3H5 directives - control parallelism
9	4	enum - extra commas
14	3	// comments
1	15	Templates
14	0	Mandate float/lang double functions
4	6	Remove float/lang double functions
0	17	Multiple inheritance
4	1	Iterators
9	5	True modules (packages)
3	3	Namespaces
1	6	Label as a data type
14	2	Bool data types
12	3	ALO's
18	0	Longer external names
9	3	Distributed (discontiguous) objects
2	4	Auto mangement of dynamic structures -
alloca		
9	6	References
0	9	Garbage collection
1	9	Logarithmic data types

5	3	Parallel I/O
12	0	International identifiers
7	4	Constructors/destructors
1	11	Dynamic casts
6	7	Statement functions
12	5	Arbitrary declarations (decl's anywhere)
3	11	Nested functions
18	0	Defect reports
5	9	New operators
4	6	Sets
12	2	Type-safe linking
2	6	Fixed point arithmetic

End of Informal Meeting

1993-12-03 08:00 (Friday Morning) -----

Review of X3J11.1 Technical Reports

JERVIS: N302 (PROSSER)

"Designated Initializers and Compound Literals"

Useful Features:

- Don't need to know the order of members to initialize.
- Creates L-value - can use "const" qualifier
get "const" (possibly non-unique) copy.

PLUM: Should analyze with respect to C++ constructors.

GWYN: Simple C extension.

FEATHER: What is the life-time of the object?

FARANACE: Mechanism matches interface specification (e.g.,
SVID
"stat") structure.

PLAUGER: WG14 does not have strong sentiment for including
constructors and destructors.

JERVIS: Compound literals could be separated from designated
initiators.

GWYN: C++ probably didn't get it right to begin with.

JERVIS: Constructors cannot be used for arrays.

JAESCHKE: How to proceed? Should have comparison of C & C++.
Should separate into two proposals.

PLAUGER: W.R.T. C and C++ we should have a large, common
subset.
We need to rationalize all compatibility issues.

[ACTION] KEATON will take responsibility for document since
PROSSER is
unavailable. Revised version in first mailing.

MACDONALD: N274 (MACDONALD)

"Restricted Pointers"

Overview/tutorial of proposal.

```
void add(int n, int *a, int *b, int *c)
{
    int i;
    for ( i = 0 ; i < n ; i++ )
        *a++ = *b++ + *c++;
}

int n = 10;
int a[10], b[10], c[10];

add(n,a,b,c);
```

Overlapping add's cause wrong results so not possible to vectorize.

Translator is free to ignore all occurrences of "restrict".

Remove in semantics subsection of section 2:

"If O is modified, then all references to values of O shall be through pointer expressions based on P."

PLUM: If X3J11 supports this, it might not be too late to incorporate in C++.

Differences between "restrict" and "noalias".

- Only pointers can be declared to be restricted. "noalias" allowed all objects to be qualified.
- "restrict" - pointers make aliasing assertions. "noalias" has L-value making aliasing assertions.
- "restrict" can create unrestricted pointer. "noalias" - could not create alias.
- Semantics of "restrict" allow static analysis of optimization.

MACDONALD: Several C & C++ vendors and workers have already tried this with much success.

THOMAS N291 (THOMAS)

"Floating Point C Extensions"

What?

- Support for, IEEE 754/854 features.
- General enhancements for FP programming
- A language spec - not an arithmetic spec.

For...

- All major FP architectures.
- Additional specification of IEEE implementation.

Why -

- IEEE effort incomplete
- Stars & planets aligned
- Leverage effort for value to new IEEE system
- Functionality and predictability to help FR programmers.

History/Status

- Prior art
- 4+ year effort.
- Subcommittee focus.
- Perpendicular making drafts.
- Section-by-section NCEG review
- Pioneer implementations - C++ and C implementations
- Preliminary review draft to J11, WG14
- Public comment draft
- NCEG approval for forwarding to J11 (7 Yes, 2 Yes with comments, 1 No with comments)
- Couple of minor proposed changes.

Design Goals

- Practicality
- Predictability
- Good C
- C++ adaptability
- Mildly Aggressive

Challenges

- Guard practicality from unnecessary idealism.
- Guard predictability from unnecessary feasibility.
- Most users to use a conforming mode most of the time.
- Input regarding of user needs.
- Treatment of special cases.

Achievements

- Bind/support for IEEE types, operators, and special values.
- Predictable yet broadly practical expression evaluation.
- Dependable access to environment, allowing reasonable optimization.
- Overloading for FP library function.
- Minimal conflict with other standard C, C++.

IEEE features supported

- Data formats
- Basic operations
- Conversions
- Rounding
- Exception flays
- Infinity, NAN's, I/O
- Recommended functions
- Math function consistency

IEEE features not supported

- Exception handling.
- Signaling NaNs.
- NaN significands.
- Complex arithmetic consistency.

Extensions to C language:

- Hexadecimal FP constants.
- Relational operators for handling NaNs

- Program to declare access to FP environment
- Program to allow/disallow contracted operations.
- Program to allow/disallow wide function parameters and returns and auto FP scalars.

Extensions to C libraries

- <fp.h> to provide
 - C match functionality
 - IEEE recommended facilities
 - other common math function
 - overloading
- <fenv.h> to access/manage FP environment
- strtbf, strtbfld
- I/O support for infinities, NaNs, and hexadecimal

Discussion:

PLUM: Relational operators take up a lot of "real estate" for a specialized audience.

THOMAS: However, "partial ordering" has been a useful operator extension in some C++ implementations as well.

MACDONALD: There are precedence questions (on equality).

Related documents:

IEC 539:1989 "Binary floating-point arithmetic for microprocessor systems."

ISO 10967-1 "Language Independent Arithmetic".

Distributed Documents:

WG14/N307 X3J11/93-054 Jim Thomas
"Why Infix Relational Operators"

WG14/N308 X3J11/93-055 Jim Thomas
"Hexadecimal FP Constants"

Discussion of "pragma" semantics.

PLUM: If <fp.h> is included, you, the programmer, give up the right to define prototypes for math library functions. This allows <fp.h> to provide special semantics if desired.

GWYN: Not sure overloading is correct if it only works for specialized (math) functions. Needs more analysis.

FRANKEL: Would rather have general overloading mechanism, (something programmers could access), but some overloading mechanism is better than none.

JERVIS: Do not want to have name mangling. Need to preserve Fortran interoperability. Overloading causes problems in these areas. Fortran 90 overloading mechanism is the desired method. Taking address of an overloaded function is an issue. Untouched C and Fortran code should still link the same. User-defined overloading is problematic vs. implementor-defined overloading (FPCE-style) is okay.

WEIDENHOFER: When will we depart from 1960's linker technology?

(Return to presentation)

Other Interesting Features

- 5 well-defined expr evaluation methods
- Include widest-need expr evaluation
- Dynamic (vs. static) FP modes
- Clarification of translation vs. execution time FP arithmetic
- Correctly rounded binary/decimal conversions
- Clarification of optimization issues
- Specification of special cases for library functions

Discussion:

FRANKEL: Widest-need is much different from normal methods of programming. A poor man's mechanism for getting more precision. Users believe they get better results which may not be the case.

Expression evaluation control allows the programmer to deal with different architectures.

(Return to presentation)

Now what?

- The need's still there.
- Evaluator/pioneer implementation prior to Standard revision.
- X3J11 endorsement of technical report.
- X3J1G interaction.
- What to do with IEEE-specific part.

Discussion:

THOMAS: Zortech, Sembiotic, Apple, Taligent, AT&T have implemented this.

KEATON: LINUX is implementing this.

JAESCHKE: Suggest taking vote at X3J11 meeting in San Jose on all 3 papers.

[ACTION] Defect Reports: Heads of groups should send wording to PLAUGER by 1993-12-17

Address:
P. J. Plauger
398 Main Street
Concord, MA
01742 USA

Phone: +1 508 369 8489
FAX: +1 508 371 9014
E-mail: pjp@plauger.com

1993-12-03 12:00 (Friday Noon) -----

(Minutes from separate WG14 meeting)

WG14 meeting

(1) Votes

- All straw votes endorsed

(2) Disposition of Comments

PLAUGER will prepare document. Heads of Delegation attending this meeting will review and bless it: (CORDSEN, DJONES, NODA, BENITO).

(3) X3J11.1 (NCEG) Technical Reports

CORDSEN: Should we have a division of work to make FP technical report a WG14 technical report?

Discussion:

DJONES: LIA people are concerned about this as just a U.S. technical report. More complicated if it's at ISO level. Keep at U.S.

CORDSEN: At least let's give agenda time at next meeting.

PLAUGER: OK

(4) Future Meetings

PLUM: WG21 meets 3x year (March, July, November) 4.5 days as joint committee. WG21 meets Sunday night. 2x North America, 1x Europe or Japan. WG14 could adopt a similar format when the revision increases the workload.

PLUM: WG14 meets now about 3x year but 2/3 meetings in USA.

1993-12-03 13:30 (Friday Afternoon) -----

[AGENDA 7] Other Business

[ACTION] MEISSNER & MACDONALD - reconcile mail reflectors.

Acknowledgement PLUM's continuing efforts.

[AGENDA 8] Future Meetings

[AGENDA 8.1] Future Meeting Schedule

WG14: 1994-07-27/1994-07-29 Tokyo area (JIS)
X3J11 only: 1994-06-06/1994-06-10 San Jose area (HP,
Perennial)
WG14, X3J11: 1994-12-05/1994-12-09 Richardson, Texas
(Convex)
(Dallas)

[ACTION] BENITO: Verify Convex is still hosting meeting.

[ACTION] JAESCHKE: Talk to X3 secretary and X3J16 about joint
WG14,
X3J11 meeting schedule and mechanics - how X3 feels about it.

[STRAW VOTE]

3 Meetings for 1995 : 14 in favor
2 Meetings for 1995 : 9 in favor
4 Meetings for 1995 : 1 in favor

[ACTION] CORDSEN: Followup on confirmation of invitation.

Danish Standards 1995-06-19/1995-06-23 7 preference
1995-06 Copenhagen 1995-06-12/1995-06-16 6 preference

Boston 1995-10-16/1995-10-20
1995-10 1995-10-09/1995-10-13
Thinking Machines

Los Angeles 1995-02-05/1993-02-09
1996-02 Unisys or
1995-02-12/1993-02-16

[AGENDA 8.2] Future Agenda Items

X3J11: Coordinate with JAESCHKE
WG14: Coordinate with PLAUGER

[AGENDA 8.3] Future Mailings

[ACTION] MACDONALD: Will do WG14 mailings.

[ACTION] FARANCE: will investigate electronic distribution

1994-01-07: Cutoff for post-meeting mailing
1994-04-29: Cutoff for pre-X3J11 meeting mailing
1994-06-03: Cutoff for pre-Tokyo meeting
1994-07-08: Cutoff for post-X3J11 meeting

[AGENDA 9] Resolutions

[AGENDA 9.1] Review of Decisions Reached

Done

[AGENDA 9.2] Formal Vote on Resolutions

[VOTE]

Motion: "Approval of all Straw Votes at this meeting"
[GWYN/MEISSNER]

X3J11: 16 Yes 0 No 0 Abstain 1 Absent

[AGENDA 9.3] Review of Action Items

[AGENDA 9.4] Thanks to Meeting Host

[AGENDA 10] Adjournment

Postponed to 17:00.

[AGENDA 4.2] Defect Reports (continued)

GWYN: N297 #2 - Deferred

Discussion: GWYN, PLUM, FEATHER

Is printing a floating point number implementation specific
(thus not conforming) or locale-specific (different from machine to
machine, but strictly conforming).

GWYN: N297 #3 - RR

Discussion of length of numeric separators for locale-
specific strings.
Can the strings (e.g., decimal separator, thousands
separator) be longer than 1.

X3J11 and WG14 believe numeric separators were intended to be
only single byte, but X/Open believes they may be a single byte or
a multibyte character. The RR will indicate that numeric
separators are single byte characters.

DJONES: N297 #16 - RR

DJONES: N297 #17 - RR

```
char *s1 = "abcde" + 2;  
char *s2 = "cde"
```

Does s1 == s2?

What happens with "ab" "cde"? Match? Yes they can be the
same.

Does "identical string shared" occur before string pasting or
after?
not clear which phase of translation string literal refers
to.

MARTIN: N297 #22 (FEATHER) - TC

Use wording supplied by FEATHER

FEATHER: N297 #30 (FEATHER) - TC

Reserved identifiers

PLUM: If WG14 were to vote that freestanding implementations may not reserve the usual library names, this would create new conformance test requirements. Test suites would have to verify that they could use *all* those library names as user identifiers. Don't think anyone wants this.

[STRAW VOTE]

Choose viewpoint #1: Yes LOTS No 2

GWYN: N297 #2 (FEATHER) - TC

[ACTION] FEATHER: Check locale-dependent or character-specific issues. Look at "isprint()".

[ACTION] GWYN: Will write up exact wording specified.

Summary:

Not Yet Reviewed:

N297: 6 7 8 23 24 25 26

N303: 24 25

DR: 60 61 62

K3:

Not Yet Presented:

N297: 21

N299: 13 14 19

Pending/Deferred

N299: 10

PLUM: What about digital signal processing chips that only have say, 4 digits accuracy. Currently, validation gates cannot test results of floating point operation.

TYDEMAN: LIA specifies this.

MEISSNER: Let marketplace solve problem.

FRANKEL: There needs to be a balance between no precision (all floating point calculations result in zero) or 1-bit precision (all results accurate to one bit)

MACDONALD: There are performance issues for precision. High precision

Kona minutes, page 23

is slow performance.

[AGENDA 10] Adjournment (continued)

Motion: Adjourn by MEISNER/MIONE

In Favor: Lots, Against: 0

1993-12-03 17:00 (Friday Afternoon)

Jonathan Ziebell

Unisys

19 Morgan St

Irvine, CA

X3J11

(714) 380-3405

THE SANTA CRUZ OPERATION LTD
EUROPE, MIDDLE EAST & AFRICA
WILEY CENTRE, HATTERS LANE,
FORD, WD1 8YN, UNITED KINGDOM.
Tel + 44 (0) 923 816344 Fax + 44 (0) 923 817781
Telex 917372 SCOLON G
Email clive@sco.COM uucp!...!uknet!scolclive

JOHN C. BENITO

(408)748-2900
uunet!peren!jb

SUITE 210
4699 OLD IRONSIDES DR.
SANTA CLARA, CA 95054

Thinking Machines Corporation

JAMES L. FRANKEL
SENIOR SCIENTIST

245 FIRST STREET
CAMBRIDGE, MA 02142
TELEPHONE: (617) 552-1234
FAX: (617) 552-1234
E-MAIL ADDRESS: frankel@tmc.com

ADAC Advanced Data Controls Corp.

Hiroshi Fukutomi
DIRECTOR

MIHON SEIMEI OTSUKA BLDG.
NO. 13-4, KITA OTSUKA 1-CHOME
OSHIMA-KU, TOKYO
70 JAPAN

TEL +81-3-3576-5351
FAX +81-3-3576-1772
e-mail: fuku@adac.co.jp

ARMY
RESEARCH
LABORATORY

DOUGLAS A. GWYN
Computer Scientist
Military Computer Science Branch



Attn: AMSRL-CI-CC
Aberdeen Proving Ground
Maryland 21005-5067
Office: (410) 278-8945
FAX: (410) 278-2934
gwyn@arl.army.mil

REX JAESCHKE
COMPUTER CONSULTANT

ANALYSIS, DESIGN, PROGRAMMING,
DOCUMENTATION AND TECHNICAL WRITING

2051 SWANS NECK WAY
RESTON, VA 22091
(703) 860-0091

Frank Farance
Farance Inc.
555 Main Street
New York NY
10044-0150 USA
E-mail: frank@farance.com
Phone: +1 212 486 4700
FAX: +1 212 759 1605

John W. Kwan
HEWLETT PACKARD
19447 PRUNERIDGE
CUPERTINO, CA
95014

jkwan@cup.hp.com

Tom MacDonald
Section Leader
Software Division - Compilers
612/683-5818
tam@cray.com

Make IT so



Neil B Martin

Quality Assurance Advisor
ISO 9000/EN 29000/BS 5750
IT Professional Standards and Practices

Lead TickIT Auditor
RBA No. A003377

9 Holst Crescent Browns Wood
Milton Keynes MK7 8DQ
United Kingdom
Tel & Fax: +44 (0)908 640778
Email: bsi_neil@cix.compulink.co.uk

Michael Meissner
Senior Software Engineer



Open Software Foundation
11 Cambridge Center
Cambridge, MA 02142
617 621 8861

meissner@osf.org

Bob Jervis
Sun Microsystems
(415) 336-7964
2550 Garcia Ave
Mountain View, CA 94043
robert.jervis@sun.com

Knowledge
SOFTWARE LTD

DEREK JONES
Managing Director

18 Lea Springs, Fleet, Hants GU13 8A
Telephone: Fleet (02514) 7453
Telex: 858893 FLETEL G

Larry Jones
Sr. Technical Consultant

SDRC

Structural Dynamics Research Corporation

2000 Eastman Drive
Millford, OH 45150-2789
Tel.: 513-576-2070

larry.jones@SDRC.COM

David M. Keaton

Compilers • Computer Architecture
Unix[®] • Custom Work

+1 303 589 9DMK
+1 719 687 3577
dmk@dmk.com
Member, ANSI C Committee

Keaton Consulting

P.O. Box 4955
Woodland Park, CO 80866
1630 30th St., #311
Boulder, CO 80302

LINDA STANBERRY
LAWRENCE LIVERMORE NAT'L LAB

422-9006

linda@ocfmail.ocf.llnl.gov

IBM

Fred J Tydeman
Advisory Programmer

International Business Machines Corporation
11400 Burnet Road
Austin, Texas 78758-3493
512 838 3322
UUCP: uunet!ibmsupt!tydeman
INTERNET: tydeman@ibmpa.awdpa.ibm.com

Neal Weidenhofer
Amdahl Inc.

1258 E Arroyo

M/S 316

Sunnyvale, CA 94085
11/28/93

Jeffrey Zeeb

Digital Equipment Corp.

110 Spit Brook Rd.

Nashua, NH 03062

(603) 881-2070

THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS

Antonino N. Mione
Systems Programmer
Rutgers University Computing Services
Hill Center for the Mathematical Sciences
Brett and Frelinghuysen Roads
P.O. Box 879
Piscataway • New Jersey 08855-0879
908/932-4785 • FAX: 908/932-2968

Bitnet: MIONE@ZODIAC
Internet: MIONE@ZODIAC.RUTGERS.EDU

Ref for: DECUS

NEC

MAKOTO NODA

ASSISTANT MANAGER
2ND LANGUAGE PROCESSOR DEVELOPMENT DEPARTMENT
BASIC SOFTWARE DEVELOPMENT DIVISION

NEC Corporation

DAITO TAMACHI BUILDING
14-22, SHIBAURA 4-CHOME MINATOKU
TOKYO 108 JAPAN
TEL +81 3-3456-7446
FAX +81 3-3456-7446
JUNET noda@lang2.bs1.mt.nec.co.jp

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P. J. Plauger
Senior Editor

508-369-8489

398 Main Street
Concord, MA. 01742

R&D Publications, Inc.

PLUM HALL

P.O. Box 44510
Samuel H. 96743
plum@plumhall.com
Fax 808-882-1556
808-882-1255

ADC

Advanced Data Controls Corp.

Keisuke Shimizu
SENIOR ENGINEER

NIHON SEIMEI OTSUKA BLDG.
NO. 13-4, KITA OTSUKA 1-CHOME
TOSHIMA-KU, TOKYO
170 JAPAN

TEL. 03 (3576) 5351
FAX. 03 (3576) 1772