

X3J11/88-155

27 Oct 88
Project 381-D

X3J11 Meeting No. 21
26-30 Sep 88

Sunnyvale Hilton Hotel
125 Lakeside Drive
Sunnyvale CA 95086
(408) 738-4888

1. Opening Activities (Brodie)

1.1 Opening Comments

The meeting convened at 9:00 a.m. on Monday, 26 Sep 88, by Chairman Jim Brodie, who welcomed participants new and old to the twenty-first meeting [sic] of X3J11, Programming Language C (X3 Project 381D). Hosts for the meeting were Borland (Jervis), Hewlett-Packard (Meloy), and Tandem (Hausman). Tom Plum served as Vice Chairman. P.J. Plaugar and Randy Hudson served as Secretary.

Brodie apologized for the one-month postponement of the meeting. The third public review period was delayed due to a mixup at CBEMA, caused by changes in administrative responsibility. He noted that CBEMA offered to host this meeting, as an act of contrition.

Brodie emphasized that the goal for this meeting is to deal with the comments from the third public review. He acknowledged the extraordinary efforts of Plum, Prosser, Gwyn, and Hudson in preparing for this meeting, as well as the corporate support of Wang in doing the mailing and the hosts for this meeting in altering arrangements so quickly.

1.2 Housekeeping

Brodie informed the Committee that Borland, Hewlett-Packard, and Tandem were serving as hosts for this meeting, so any requests for copies of documents should be funneled through Hausman.

1.3 Approval of Previous Minutes

Plaugar submitted the minutes of the previous meeting (88-081) for amendment or correction. The minutes were accepted with no changes. Mazeltov.

1.4 Approval of Agenda

Brodie submitted a Preliminary Agenda (88-109) for approval. With small changes, the Agenda was approved. The revised Agenda (88-109R) is Attachment II to these minutes.

1.5 Introduction of New Participants

All attendees introduced themselves to the Committee.

1.6 Next Meeting

The date of the next meeting will be fixed later in the meeting.

1.7 Procedures for this Meeting

Brodie announced that the meeting would once again consist of several subgroup meetings, to review correspondence in parallel. Each subgroup was authorized to say no to a request for a change or to accept editorial changes. Subgroups should prepare presentations to the entire Committee for any substantive changes or other debatable responses.

Brodie suggested that the Committee take only straw votes (voting members only) until all issues have been addressed. This should lower resistance to individual changes, should the preponderance of evidence suggest that some change is inevitable. He again essayed a working definition of "substantive change."

1.8 Distribution of New Documents

Plum reported that documents through 88-138 have been mailed. Additional documents through 88-146 were distributed.

1.9 Review of Action Items

Brodie scanned the previous minutes (88-081) for action items noted.

Jackson owed Rationale words describing premature termination.

Meissner owed Rationale words on why %R in printf was not accepted.

Brodie owed the Committee guidelines on usage of the draft standard.

All other action items were completed.

1.10 X3 Notices (Brodie)

Brodie passed on several items of potential interest from X3.

Plum urged the Committee to name an official liaison to GKS. Jones has been acting unofficially as observer of matters graphic.

1.11 Roll Call

An attendance sheet was circulated and all attendees were asked to verify or write down their names and addresses. Those in attendance are listed in Attachment I. Fifty attendees were deemed eligible to vote, having attended at least one of the preceding two meetings and having expressed the intention of becoming voting members. These were:

J. Stephen Adamczyk, Edison Design Group
Jim Balter, self
Mike Bennett, Gould Electronics CSD
Don Bixler, Unisys
Art Bjork, Digital Equipment Corp.
Craig Bordelon, Bell Communications Research
Oliver Bradley, SAS Institute, Inc.
Jim Brodie, Jim Brodie & Associates
Terry Colligan, Rational Systems
Elizabeth Crockett, Apple Computer
Peter Darnell, Stellar
Steve Davies, Concurrent Computer
Shawn Elliott, IBM
Frank Farance, Farance Inc.
Douglas Gwyn, U.S. Army Ballistic Research Lab.
John Hausman, Tandem Computers
Randy Hudson, Intermetrics Inc.
Rex Jaeschke, DEC Professional
Bob Jervis, Borland International
Gary Jeter, Harris Computer Systems Div.
Andrew Johnson, Prime Computer, Inc.
Larry Jones, SDRC
Monika Khushf, Tymlabs
Tom MacDonald, Cray Research, Inc.
Courtney Meissen, Sun Microsystems
Michael Meissner, Data General
Sue Meloy, Hewlett-Packard
Daniel Mickey, Chemical Abstracts
Clark Nelson, Intel
Stephen Ness, Mark Williams Co.
Theodore Norvell, Control Data
Leonard Ohmes, Datapoint
Thomas Osten, Honeywell Bull
Tom Pennello, MetaWare
P.J. Plauger, Whitesmiths, Ltd.
Tom Plum, Plum Hall
David Prosser, AT&T
Chuch Rasbold, Super Computer Systems, Inc.
Richard Relph, EPI
Larry Rosenthal, Sierra Systems
Fred Rozakis, Wang
Daniel Saks, Saks & Associates
Rick Schubert, NCR
Linda Stanberry, Lawrence Livermore National Labs
Carl Sutton, Tektronix
Mike Terrazas, DECUS
Lucy Van Leeuwen, Masscomp

Neil Weidenhofer, Amdahl Corp.
Dave Weil, Microsoft
Jim Williams, Naval Research Lab

2. Liaison Activities

2.1 ISO Report

Plauger reported that ISO WG14 met in London 13-14 Jun 88. WG14 agreed not to submit any further drafts for ISO balloting until X3J11 voted a draft out to X3. The U.K. expressed concern that the current X3J11 draft was not sufficiently precise, particularly in the area of the preprocessor. Denmark objected strongly to the failure of X3J11 to adopt any form of digraphs, as a more readable alternative to trigraphs using the ISO 646 character set. Comments from both of these delegations have been submitted as part of the third public review.

Plauger reported that he is authorized to submit the final X3J11 draft directly for registration as a DIS only if both the U.K. and Denmark do not object to its content. Otherwise, he will submit the final X3J11 draft for reballoting as a DP (the stage before a DIS). If no more than two member nations vote against the DP, it can then be registered as a DIS.

The next ISO meeting will be held in conjunction with the next X3J11 meeting.

Prosser reported that he had been in communication with Boldyreff and Mycroft of the BSI (U.K.), in an attempt to clarify and answer some of their concerns. His report (88-139) addresses some of these issues.

2.2 P1003

Gwyn reported that POSIX became an official IEEE standard on 22 Aug 88. Draft 13 of P1003.1 is the final standard. He identified two differences with the X3J11 draft: fflush on an input stream must discard buffered input under POSIX (probably not incompatible with X3J11), and POSIX defines a global environ (possibly an issue).

The NIST (formerly NBS) is developing a validation suite for POSIX based on the interim FIPS 151 (POSIX Draft 12). It will be updated to match the final standard.

2.3 Other

Adamski reported that SQL currently has no public comments on the C binding.

3. Redactors' Reports

3.1 Draft Standard

Prosser submitted his report (88-139) and thanked the reviewers who checked the last draft.

3.2 Rationale

Hudson also thanked contributors to the Rationale.

4. Review of Current Status

Brodie reviewed the processing steps that follow once the Committee votes to send the draft to X3. Allowing for editorial preparation, administrative processing, a 15-day reply period, a 30-day X3 letter ballot, response to any negative comments, and a 30-day ANSI letter ballot, the Standard cannot be adopted before Mar 89 at the earliest.

5. International Issues

Plauser presented several papers (88-132, 88-134, 88-108) concerning issues of international concern. He identified as most critical the request from WG14, on behalf of Denmark, to add more readable digraphs to the Standard.

The specific proposal was to add another standard header that would define various names for operators and punctuators that are redefined in local versions of ISO 646, to define some new alternate spellings for operators and punctuators (such as `(: for {})`, and to define the infix operator `x!y` as equivalent to `x[y]`. Plauser reminded the Committee that Denmark felt sufficiently strongly about this capability that they were willing to press for an ISO standard that differs from ANSI, if X3J11 doesn't adopt it.

Plum observed that people were at liberty to define various kinds of macros to change the syntactic sugar that sweetens C. He felt that X3J11 should take no stand on a particular set. He also observed that the proposed extensions did not solve the problem of representing punctuation readably within string literals, and did not solve the problem of writing declarations such as `a[]` (since `x!()` is presumably invalid).

Plum asked that X3J11 respectfully say no to the request from WG14. He also urged the Danish members of WG14 to reconsider their opposition to the draft as it stands.

Gwyn felt that the problem as presented was a red herring. He stated that all European shops that he knew had found various ways to deal with the presentation problem in ISO 646, and that these solutions did not belong in the standard.

To avoid any bias against making the first substantive change, Brodie suggested that the Committee defer a full vote until all substantive issues had been aired. There was no objection.

Straw vote:

0 accept digraphs a la 88-134
40 no

- ** Hudson will draft Rationale wording on why digraphs were not adopted.

Plauser reported that the U.K. concerns were expressed in a number of public comments that the Committee would be addressing during the week. He understood there to be no requests for substantive changes. Rather, the U.K. was seeking a clearer draft.

6. Organization of Subgroups

Thanks to the advance work of Gwyn, the public responses were quickly divided up among a number of subgroups. The subgroups were empowered to answer any issues for which they felt that the Committee had a clear position. They would prepare presentations on issues that needed the attention of the Committee as a whole.

7. Group Review

The Committee broke up into subgroups to review public comments.

8. Subgroup Presentations

Gwyn presented a request (88-131, 88-121 #5) that we make environ an implementation defined global object, to better conform to POSIX. Plum objected to the change, since the standard headers must change in small ways between and Standard C and a POSIX environment. Prosser agreed that environ is not a problem in reconciling the two standards.

Straw vote:

5 change draft to eliminate environ conflict
32 no change

- ** Plum will help with Rationale wording on why environ was not added.

Jeter asked for clarification (88-111 #1B) on whether array and function designations are converted to pointers as right operands of comma. Plauser argued that this and all rvalue contexts cause the conversion, as well as widening of integer types. Prosser felt that arrays should be converted to pointers, but types should be widened only for the arithmetic operators.

Straw vote:

3 need to clarify effect of x, array
16 no change

** Plum will provide Rationale on why sizeof ((char) X) == 1.

Bixler presented a request (88-097) that users be assured that they can define a macro named ERRNO, despite the fact that <errno.h> reserves E* macro names. There was no support.

Bixler presented a request (88-097 p. 9) that we declare obsolescent the implicit declaration of called functions.

Straw vote:

5 make implicit declaration by f() obsolescent
17 no change

Norvell presented a request (88-097 p. 4) that we allow a sequence of statements within the parentheses of an expression. There was no support.

Bixler presented a request (88-097 p. 15) that we provide a way to pop items from the atexit stack. After some discussion, there was no support.

Meissner presented a request (88-126 #3) that we say fflush flushes read ahead on an input stream, as in POSIX. Currently the behavior is undefined (which subsumes POSIX behavior). There was no support for change.

Meissner presented a request (88-125 #1) that we require each implementation to distinguish erroneous input from valid. Pennello offered wording. Accepted as editorial.

9. Presentations

Meissner presented a request (88-125 #6, #11) that we change constraint wording on integral constant expressions, so that an implementation can add to the basic set of ICE's (such as "case offsetof ..."). Alternate wording will be provided for a vote later in the meeting.

Weil presented a request (88-099 p. 6 bottom) that we clarify whether writing to an append file counts as an fseek call in the semantics of mode switching between reads and writes. There was much discussion.

Straw vote:

0 say append write counts as fseek
lots no

Straw vote:

11 tighten wording about append writes
1 no

Weil will provide words for later in the meeting.

Bradley (88-116 p. 1) requested a change in the tokenization rules for preprocessor numbers, since 0xE+1 and 0xE+cat parse

as erroneous tokens by the new rules adopted by X3J11. He proposed that we either require such tokens to be retokenized if they appear to be erroneous or that we restrict tokens more tightly so hex numbers ending in E don't keep gobbling text.

Straw vote:

- 27 need to fix 0xE+1
- 13 leave it alone

Bradley will propose a fix for later in the meeting.

Bradley requested (88-116 last) that we say the library is serially reentrant for signals. Otherwise, a user signal handler fielding SIGINT during library operation can severely constrain how the library can use signal() to handle exceptions. There was some discussion of what the Committee intended, and whether a signal handler can portably affect any but its own signal.

Bradley will propose alternate wording for later in the meeting.

10. Subgroup Reviews

The Committee broke into subgroups to summarize further responses.

11. Presentations

Bradley presented wording clarifying that a signal handler can call signal() only to affect its own signal. There was some discussion as to whether this is a substantive change. Eventually, the wording was accepted as editorial.

Colligan presented a request (88-098 #3) that we emphasize that (char)x truncates the value of x as if by assignment to a char object. Prosser observed that (~0U+1) must also yield zero. (High order carries must not be retained when unsigned rvalues are evaluated to excess precision.) There was much discussion.

Plum agreed to essay wording on the behavior of "knothole" casts.

Colligan presented a request (88-124 #7) that we add an example clarifying the interaction between #if and #include. There were no issues at stake.

Colligan presented a request (88-124 #9) that we clarify the behavior of

```
#define f(a) a * g
#define g f
f(2) (8)
```


Does this expand to $2*f(8)$ or to $2*8*g$. It was agreed that the former is the more likely expansion, but that this is an area intentionally left gray.

Colligan presented a request (88-124 #8) that we clarify whether the following example works:

```
#define RP )
#if defined ( m RP
```

It was agreed that the defined operator works only on parentheses identified on an overt parse (before any macro expansion). So this does not work as one might expect. There was some discussion as to whether this is a constraint violation (which must be diagnosed) or simply undefined (which need not be).

Straw vote:

```
9 defined ( is constraint violation
16 it's undefined
```

Colligan (88-124 #4) presented a request that we clarify the rules for pointer subtraction, since the current draft indicates that $\&a[0]-\&a[n]$ is undefined. There was some discussion.

Straw vote:

```
20 need to clarify pointer subtraction
2 leave alone
```

Accepted as editorial.

Prosser presented a request (88-143 p. 2) that we remove the requirement that `void *` have the same representation as `char *`. It was agreed that this is a substantive change. There was some discussion as to why the equivalence was put in the draft (so one can call `qsort` using `strcmp` as the sorting function, and so old C programs are more likely to work right).

Straw vote:

```
5 eliminate void * and char * equivalence
16 leave it
```

The same comment included a request that we define `sizeof (void) == 1`. There was no support.

Meissner presented a request (88-114 p. 3) that we clarify whether compile time arithmetic can hold more bits than the target. In particular, can the value of `~0U >> 8` be different at compile and run times.

Plauser observed that the clearer statement of unsigned arithmetic rules implicitly requires that the compile time result retain no high order one bits. Signed integer arithmetic can differ because extra bits merely change

undefined behavior. Ditto for extra precision in floating calculations.

There was considerable discussion about whether the draft was adequate or should require that arithmetic results be "the same."

Straw vote:

9 need to clarify range & precision at compile time
20 leave it alone

Jervis presented a request (88-138 #17) that we clarify permissible uses of secret names, such as _X macros in headers. He proposed better wording which was accepted as editorial.

Jervis presented a request (88-138 #3) that we clarify whether void * and char * can be passed as arguments or returned as function values in different ways, even though they have the same representation. Also, can they differ when aliased or when members of a union? After some discussion, the Committee agreed to clarify that the two types should behave interchangeably. Accepted as editorial. MacDonald presented a request (88-120 #5) that we replace references to "value part" or "mantissa digits" with "significand." There was considerable discussion. Deferred until later in the meeting.

MacDonald presented a request (88-120 #3) that we relax the requirement that a floating result be the "next higher or next lower value" than the exact result. There was again considerable discussion. Also deferred until later.

MacDonald presented a request (88-120 #6) that we clarify that the floating point model used in the description need not be identical to the model implemented. Accepted as editorial.

MacDonald presented a request (88-120 #1) that we state in Future Directions that LDBL_MAX_10_EXP should be at least 99 in future. There was some discussion.

Straw vote:

5 require long double of 10*99 in future
23 no

MacDonald presented a request (88-120 #8) that we allow array parameters to have variable dimensions, by moving the constant size requirement from constraints to semantics. After some discussion, it was agreed that this is a substantive change.

Straw vote:

5 permit variable size array parameters
lots no

MacDonald presented a request (88-120 #10) that we make implementation defined whether the math library sets errno. After some discussion, it was agreed that this is a substantive change.

Straw vote:

- 11 setting errno to EDOM or ERANGE is impl. def.
- 13 leave alone

MacDonald presented a request (88-128 #7) that we exclude tan from the list of functions that must get the sign of HUGE_VAL correct if the return result is too large, since it's chancey where the value flips. Accepted as editorial.

Jeter presented a request (88-111 #15) that we clarify whether one can #define tm (a reserved tag name) or tm_usec (a potential extra field) before including <time.h>. It was agreed that tm cannot be #defined, but protection of member name spaces for library structures is problematic. No specific proposal advanced.

Jeter presented a request (88-111 #17) that we change the expansion of assert when NDEBUG is defined so that it expands (and syntax checks) its argument in an innocuous way.

Straw vote:

- 7 need to fix assert for NDEBUG defined
- 16 no

Jeter presented a request (88-111 #15) that we clarify the effect of

```
#include <stdio.h>
#undef NULL
#include <stdio.h>
#ifdef NULL
```

It was agreed that this behavior is simply undefined.

13. Presentations

Weidenhofer presented a request (88-119 #12) that we clarify whether one can declare struct tags as a side effect of declaring parameters to a function, as in

```
int f(a, b)
int a;
struct s {...} b;
{...}
```

The consensus was that this should be permissible. Prosser agreed to develop clarifying wording.

Weil presented a request (88-099 p. 7) that we clarify whether setvbuf with _IOLBF causes input line buffering.

Straw vote:

21 need to clarify input line buffering
5 leave alone

Accepted as editorial.

Weil presented a request (88-099 p. 8) that we require ungetc to discard a pushed back character if the file position indicator is undefined. It was agreed that status quo doesn't permit such a push back. No issue.

Bradley presented a request (88-118) that we say the scope of a tag declared within a prototype be the same as the scope of the function declared by the prototype. Prosser objected that this was inconsistent, and overkill. There was some discussion.

Straw vote:

1 extend scope of tags outside prototypes
lots no.

Bradley presented a request (88-163 #3) that we permit `f().a[i]` to select from an array within a returned structure value. (The draft disallows this.) Plum felt that this is nonportable, but a permissible extension.

Straw vote:

5 allow `f().a[i]`
25 no

Bradley presented a request (88-113 p. 22) that we clarify that the "same representation" of `void *` and `char *` extends to other properties such as alignment, method of passing, etc. After some discussion, the clarification was deemed to be editorial.

Straw vote:

lots clarify that `void *` behaves just like `char *`
0 no

Meissner presented a request (88-114 #2) that we clarify the descriptions of section 1.6 (p. 3) to better distinguish between objects, declarations, and identifiers. Accepted as editorial.

Weil presented a request (88-099 p. 21) that we clarify that `printf` output a minus sign for negative values, in the absence of the `'+'` conversion flag.

Straw vote:

15 need to clarify when `printf` puts `'-'`
3 no

Weil will provide wording.

MacDonald revisited the issue of "significand" (88-120 #5).

Straw vote:

- 16 use the term "significand" in floating model
- 3 leave alone

Accepted as editorial.

MacDonald revisited the issue of "nearest representable value" (88-120 #3). He proposed that the result be "either the nearest representable value or one of the two nearest higher or lower representable values." Accepted as editorial.

Meissner presented a request (88-125 #1, 6) that we clarify whether (i++ = 5) is a constraint violation. It is.

Several submissions (88-105 on wording of comparison functions, 88-139 assorted) were accepted as editorial changes.

Plum proposed wording for the compile time precision issue (88-098 p. 1) -- just say that floating operands can have greater precision or range at compile time, not integer. Accepted as editorial.

Prosser proposed (88-139 #6) that we clarify that a struct or union with no members is undefined behavior.

Straw vote:

- 21 say empty struct or union undefined
- 4 leave alone

Accepted as editorial.

14. Presentations

Prosser proposed (*8-139 #5) that we say scalars behave as arrays of size 1 for the sake of pointer arithmetic. Johnson asked if this is a substantive change.

Straw vote:

- 4 scalar as size 1 array is substantive
- 16 no

After some discussion, the Committee agreed to accept the wording as an editorial change.

Prosser proposed (88-139 #4.1) wording to clarify the meaning of multiple dimensioned arrays. Gwyn suggested that the clarification be added as a footnote.

Straw vote:

- 7 add footnote on multidimensioned arrays
- 19 no

Dropped.

Prosser proposed (88-139 #4.2) that we clarify that pointer arithmetic must not overflow.

Straw vote:

- 1 prohibiting pointer overflow is substantive
- 24 no

Straw vote:

- 20 clarify pointer overflow rules
- 2 no

Accepted as editorial.

Prosser proposed (88-139 #4.3) that we clarify that type qualifiers are only meaningful for lvalues.

Straw vote:

- 0 need to clarify that qualifiers affect only lvalues
- lots no

Prosser proposed (88-139 #4) that we make obsolescent function definitions with no declaration specifiers for arguments.

Straw vote:

- 5 make obsolescent function defs with no specifiers
- 25 leave alone

Not accepted.

Prosser proposed (88-139 #5) that we permit parmN is va_start to have a type that changes when widened. There was no support.

Darnell requested (88-146) that we make obsolescent the aliasing of array parameters, to leave the door open for future semantics. There was much discussion.

Straw vote:

- 26 make obsolescent aliasing of array parameters
- 7 no

Accepted.

The remaining possibly substantive issues were identified as: preprocessing number syntax (Bradley), constraints on integral constant expressions (Plum), and which library macros are valid in #if expressions (Prosser).

Plum proposed that we add: "An implementation may accept other forms of constant expressions." Accepted as editorial.

Prosser proposed alternate wording to clarify that tags may be defined in parameter declarations. There was some discussion, which eventually ran down and stopped. Accepted.

Bradley proposed two possible changes to preprocessor number syntax, one due to Redelmeier (88-054) and one due to Prosser. Bradbury presented Redelmeier's grammar. There was some discussion.

Straw vote:

19 changing pp numbers is substantive
6 no

Straw vote:

6 should change pp number grammar
22 no

Dropped.

15. Presentations

Prosser proposed a list of clarifications for what macros can be used in #if expressions and what cannot. Basically, every macro identified as an integral constant expression and not explicitly stated otherwise should be usable in #if expressions. Accepted as editorial.

Several other small editorial changes were adopted.

16. Vote on Submittal

Elliott/Hudson

"Move we send 88-091 as edited at this meeting to X3 as the ANSI C Standard, subject to review of the final documents by review subcommittees."

Roll call:

Adamczyk, absent.

Balter, yes.

Bennett, yes.

Bixler, yes.

Bjork, yes.

Bordelon, yes.

Bradley, yes.

Brodie, yes.

Colligan, yes.

Crockett, yes.

Darnell, yes.

Davies, yes.

Elliott, yes.

Farance, yes.

Gwyn, yes.

Hausman, yes.

Hudson, yes.

Jaeschke, yes.

Jervis, yes.

Jeter, yes.

Johnson, yes.

Jones, yes.

Khushf, yes, but would have liked to have seen at least one review of the decision affecting obsolescence of array brackets in function parameter declarations.

MacDonald, yes.

Meissen, yes.

Meissner, yes.

Meloy, yes.

Mickey, yes.

Nelson, yes.

Ness, yes.

Norvell, yes.

Ohmes, yes.

Osten, yes.

Pennello, yes.

Plauger, yes.

Plum, yes.

Prosser, yes.

Rasbold, yes.

Relph, absent.

Rosenthal, yes.

Rozakis, yes.

Saks, yes.

Schubert, yes.

Stanberry, yes.

Sutton, yes.

Terrazas, yes.

Leeuwen, yes.

Weidenhofer, yes.

Weil, yes.

Williams, yes.

Motion carried, 48/0 with 2 absent.

17. Future Actions

Brodie reviewed the actions required to prepare the draft for submission to X3. The response document is to be reviewed on 20/21 Oct 88 at Plum-Hall (Plum). The draft standard is to be reviewed on 27 Oct 88 at AT&T (Prosser). The rationale is to be reviewed on 9 Nov at Intermetrics (Hudson). The combined documents are to be mailed on 14 Nov 88 from Intermetrics (Hudson). Responses to X3 on 9 Dec 88.

- ** Brodie will respond to the Information Resources Dictionary Systems review request.
- ** Gwyn will inform IEEE 1003 of our status.
- ** Adamski will inform X3H2.
- ** Jones will inform X3H3.

** Johnson will inform X3L5.

** Meissner (Data General) will handle next mailing.

Brodie asked the Committee to empower the review subcommittees to make any necessary changes to documents. There was no objection.

12. Future X3J11 Meetings

The next meeting will be held 09-10 Mar 89 in Seattle WA (Microsoft). Brodie urged any members who do not intend to remain active to resign formally.

The meeting after that will be held 21-22 Sep 89 in Salt Lake City UT (DECUS).

Brodie solicited volunteers for a subcommittee to assist in interpreting the standard in response to future queries. A number of members volunteered.

20. Subgroup Preparation

The Committee broke into subgroups to complete preparation of responses.

21. Adjourn

Somebody/Somebody Else

"Move we adjourn."

Motion carried, lots/0.

The meeting adjourned on Friday, 30 Sep 88 at 12:00.

Attachments:

Revised agenda
Attendance sheets

X3J11/88-109R

30 Sep 88
Project 381-D

REVISED AGENDA
X3J11 Standards Committee Meeting

26-30 Sep 88
Sunnyvale Hilton Hotel
125 Lakeside Drive
Sunnyvale CA 95086
(408) 738-4888

26 Sep -- 9:00 - 12:00 2:00 - 5:30
27 Sep -- 8:30 - 12:00 2:00 - 5:30
28 Sep -- 8:30 - 12:00 2:00 - 5:30
29 Sep -- 8:30 - 12:00 2:00 - 5:30
30 Sep -- 8:30 - 12:00 noon

Monday, 26 Sep

1. Opening Activities (Brodie)

- 1.1 Opening Comments -- Goals and Purposes of
Twenty-first Meeting of X3J11
- 1.2 Housekeeping
- 1.3 Approval of Previous Minutes (88-081)
- 1.4 Approval of Agenda (88-109)
- 1.5 Introduction of New Participants
- 1.6 Distribution of Information on Next X3J11 Meeting
- 1.7 Procedures for this Meeting
- 1.8 Distribution of Any New Documents
- 1.9 Review of Action Items from Previous Meeting
- 1.10 X3 Notices
- 1.11 Roll Call

2. Reports on Liaison Activities

- 2.1 ISO Report (Plauser)
- 2.2 P1003 Report (Gwyn)
- 2.3 Other Liaison Activities (Brodie)

3. Report of the Redactors (Prosser and Hudson)

4. Report on Current Status and Schedules (Brodie)

5. International Issues (Plauser)

6. Organization of Subgroups

7. Subgroup Review of Public Comments

8. Presentations by Subgroups

Tuesday, 27 Sep

9.Subgroup Presentations

10.Subgroup Preparation

11.Subgroup Presentations

Wednesday, 28 Sep

12.Subgroup Presentations

13.Subgroup Presentations

Thursday, 29 Sep

14.Subgroup Presentations

15.Subgroup Presentations

16.Vote on Submittal for 3rd Public Review

Friday, 30 Sep

17.Future Actions

18.Future X3J11 Meeting Schedule (Brodie)

19.Other Business (Brodie)

20.Subgroup Preparations

21.Adjournment (Brodie)

note on SH: Y=yes, abs=absent

at Sep 24 07:51:38 1988 Principals and Alternates

	M	T	W	T	F
195 Jim.....Y Balter.....	✓	✓	✓	✓	✓
'88 Robert.....Bradbury.....	—	—	—	—	—
74 Edward G ..Chin.....	—	—	—	—	—
233 Neil.....Daniels.....	—	—	—	—	—
995 Stephen....Desofi.....	—	—	—	—	—
194 Michael....Duffy.....	—	—	—	—	—
885 Phillip....Escue.....	—	—	—	—	—
075 Gerd.....Moellman.....	—	—	—	—	—
663 Ralph.....Phraner.....	—	—	—	—	—
198 Hugh.....Redelmeier.....	—	—	—	—	—
247 Arnold.....Robbins.....	—	—	—	—	—
384 Roger.....Wilks.....	—	—	—	—	—
201 Michael....Young.....	—	—	—	—	—
233 David....Y Prosser.....AT&T.....	✓	✓	✓	✓	✓
083 Steve.....Adamski.....AT&T.....	✓	✓	✓	✓	✓
312 Bob.....Gottlieb....Alliant Computer Systems.....	—	—	—	—	—
213 Kevin....Y Brosnan....Alliant Computer Systems.....	—	—	—	—	—
088 Neal....YA Weidenhofer Amdahl.....	✓	✓	✓	✓	✓
147 Philip....Steel.....American Cimflex.....	—	—	—	—	—
148 Eric.....McGlohon....American Cimflex.....	—	—	—	—	—
504 Stephen....Kafka.....Analog Devices.....	—	—	—	—	—
151 Kevin.....Leary.....Analog Devices.....	—	—	—	—	—
152 Gordon....Sterling....Analog Devices.....	—	—	—	—	—
269 John.....Peyton.....Apollo Computer.....	—	—	—	—	—
437 Michael....Dieter.....Apollo Computer.....	—	—	—	—	—
149 Elizabeth.Y Crockett....Apple Computer.....	✓	✓	✓	✓	✓
374 Ed.....Wells.....Arinc.....	—	—	—	—	—
36 Tom.....Ketterhagen Arinc.....	—	—	—	—	—
26 Vaughn....Y Vernon.....Aspen Scientific.....	—	—	—	—	—
820 Craig.....Bordelon....Bell Communications Research...	✓	✓	✓	✓	✓
898 Steven....Carter.....Bell Communications Research...	—	—	—	—	—
840 Bill.....Puig.....Bell Communications Research...	—	—	—	—	—
220 Bob.....Y Jervis.....Borland Software International.	✓	✓	✓	✓	✓
465 Yom-Tov....Meged.....Boston Systems Office.....	—	—	—	—	—
238 Rose.....Thomson....Boston Systems Office.....	—	—	—	—	—
527 Maurice....Fathi.....COSMIC.....	—	—	—	—	—
942 John.....Wu.....Charles River Data Systems.....	—	—	—	—	—
317 Daniel....Y Mickey.....Chemical Abstracts.....	✓	✓	✓	✓	✓
357 Thomas....Mimlitch....Chemical Abstracts	—	—	—	—	—
091 Alan.....Losoff.....Chicago Research & Trading.....	—	—	—	—	—
881 Edward....Briggs.....Citibank.....	—	—	—	—	—
298 Firmo.....Freire.....Cobra S/A	—	—	—	—	—
807 Jim.....Patterson...Cognos	—	—	—	—	—
539 Bruce.....Tetelman....Columbia Univ Ctr for Comput...	—	—	—	—	—
861 Terry.....Moore.....CompuDAS.....	—	—	—	—	—
013 Mark.....Barrenechea.Computer Associates.....	—	—	—	—	—
371 George....Eberhardt...Computer Innovations.....	—	—	—	—	—
236 Dave.....Neathery....Computer Innovations.....	—	—	—	—	—
229 Joseph....Y Bibbo.....Computrition.....	—	—	—	—	—
11 Steve....Y Davies.....Concurrent Computer.....	✓	✓	✓	✓	✓
46 Don.....Fosbury....Control Data.....	—	—	—	—	—
39 George....VandeBunte..Control Data.....	—	—	—	—	—
39 Lloyd....Y Irons.....Cormorant Communications.....	—	—	—	—	—
'6 Tom.....MacDonald...Cray Research.....	✓	✓	✓	✓	✓
85 Lynne.....Johnson....Cray Research.....	—	—	—	—	—
64 Dave.....Becker.....Cray Research.....	—	—	—	—	—

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M T W T F

	M	T	W	T	F
091 Jean.....Risley.....Custom Development Environments					
85 Rex.....Jaeschke.....DEC Professional.....	✓	✓	✓	✓	✓
78 Mike.....Terrazas.....DECUS.....	✓	✓	✓	✓	✓
226 Michael.....Meissner.....Data General.....	✓	✓	✓	✓	✓
943 Mark.....Harris.....Data General.....	✓	✓	✓	✓	✓
278 Leonard.....Ohmes.....Datapoint.....	✓	✓	✓	✓	✓
325 James.....Stanley.....Data Systems Analysts.....					
920 Samuel.....Kendall.....Delft Consulting.....					
806 Randy.....Meyers.....Digital Equipment Corp.....					
882 Art.....Bjork.....Digital Equipment Corp.....	✓	✓	✓	✓	✓
807 Lu Anne.....Van de Pas.....Digital Equipment Corp.....	✓	✓	✓	✓	✓
444 Ben.....Patel.....EDS.....					
026 Richard.....Relph.....EPI.....	✓				
732 Graham.....Andrews.....Edinburgh Portable Compilers...					
510 Colin.....McPhail.....Edinburgh Portable Compilers...					
383 J Stephen.....Adamoyk.....Edison Design Group.....	✓	✓	✓		
216 Eric.....Schwarz.....Edison Design Group.....		✓	✓		
255 Dmitry.....Lenkov.....Everest Solutions					
195 Frank.....Farance.....Farance Inc.....			✓	✓	✓
447 Peter.....Hayes.....Farance Inc.....					✓
237 Florin.....Jordan.....Floradin.....					
208 Michael.....Koo.....GE.....					
214 Lia.....Sanville.....Gould CSD.....					
235 Tina.....Aleksa.....Gould CSD.....					
276 Thomas.....Kelly.....HCR Corporation.....					
346 Paul.....Jackson.....HCR Corporation.....					
232 Gary.....Jeter.....Harris Computer Sys Div.....	✓	✓	✓	✓	
10 Sue.....Meloy.....Hewlett Packard.....	✓	✓	✓	✓	
83 Larry.....Rosler.....Hewlett Packard.....	✓	✓	✓	✓	
438 Walter J.....Murray.....Hewlett Packard.....	✓	✓	✓	✓	
238 Thomas.....Osten.....Honeywell Information Systems...	✓	✓	✓	✓	✓
312 David.....Kayden.....Honeywell Information Systems...	✓	✓	✓	✓	✓
580 Shawn.....Elliott.....IBM.....	✓	✓	✓	✓	✓
114 Larry.....Breed.....IBM.....	✓	✓	✓	✓	✓
215 Mike.....Goldberg.....IBM.....	✓	✓	✓	✓	✓
15 Donald.....Kretsch.....IEEE 1003.....					
84 Mike.....Banahan.....Instruction Set.....					
08 Clark.....Nelson.....Intel.....	✓	✓	✓	✓	✓
14 Dan.....Lau.....Intel.....	✓	✓	✓	✓	✓
18 John.....Wolfe.....InterACT.....					
19 Lillian.....Toll.....InterACT.....					
89 Randy.....Hudson.....Intermetrics.....	✓	✓	✓	✓	✓
17 Keith.....Winter.....International Computers Ltd....					
50 Honey.....Schrecker.....International Computers.....					
17 Jim.....Brodie.....J Brodie & Assoc.....	✓	✓	✓	✓	✓
29 Jacklin.....Kotikian.....Kendall Square Research.....					
56 Svein.....Davidsen.....LSI Logic Ltd.....					
80 John.....Kaminski.....Language Processors Inc.....					
57 David.....Yost.....Laurel Arts.....					
20 Mike.....Linda.....Stanberry.....					
25 Bob.....Weaver.....Lawrence Livermore Natl Labs...	✓	✓	✓	✓	
84 Lidia.....Eberhart.....MODCOMP.....					
28 Robert.....Sherry.....Manx Software.....					
75 Courtney.....Proehl.....					
66 Patricia.....Jenkins.....Masscomp.....	✓	✓	✓	✓	
07 Dave.....Hinman.....Masscomp.....	✓	✓	✓	✓	✓

STEPHEN Y NESS

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M T W T F

368	Michael	Y. Kearns	MetaLink					
40	Tom	Y. Pennello	MetaWare	✓	✓	—	✓	—
92	Dave	Y. Weil	Microsoft	✓	✓	✓	✓	—
782	Mitch	Harter	Microsoft					
636	Kim	Kempf	Microware Systems					
940	Shane	McCarron	Minnesota Educational Computing					
237	Bruce	Olsen	Mosaic Technologies					
681	Michael	Paton	Motorola					
306	Rick	Y. Schubert	NCR	✓	✓	✓	✓	✓
305	Brian	Johnson	NCR Comten					
236	Joseph	Mueller	National Semiconductor					
881	Derek	Godfrey	National Semiconductor					
260	Jim	Y. Upperman	Natl Bureau of Standards Techno					
235	Jim	Y. Williams	Naval Research Laboratory	✓	✓	✓	✓	✓
520	Tom	Scribner	Novell					
677	Doug	Snapp	Novell					
929	Lisa	Simon	OCLC					
974	Paul	Amaranth	Oakland Univ Off of Compt					
726	Augie	Hansen	Omniware					
699	Michael	Rolle	Oracle					
494	Bob	Toelle	Oregon Software					
171	Barry	Hedquist	Perennial					
461	Sassan	Hazeghi	Peritus Intl					
217	James	Holmlund	Peritus Intl					
436	William	Y. Hafner	Pictorial/V-marc					
049	Thomas	Y. Plum	Plum Hall	✓	✓	✓	✓	✓
141	Chris	Skelly	Plum Hall					
03	Ralph	Ryan	Plum Hall					
224	Andrew	Y. Johnson	Prime Computer	✓	✓	✓	✓	✓
944	Fran	Litterio	Prime Computer					
389	Daniel J.	Conrad	Prismatics Inc.					
896	David	Fritz	Production Languages					
107	Kenneth	Pugh	Pugh Killeen					
242	Ed	Ramsey	Purdue Univ					
207	Steve	Roberts	Purdue Univ					
468	Kevin	Nolan	Quantitative Technology Corp					
469	Robert	Mueller	Quantitative Technology Corp					
086	Chris	DeVoney	Que					
258	Jon	Tulk	Rabbit Software					
156	Terry	Y. Colligan	Rational Systems	✗	✗	✗	✗	✗
056	Oliver	Y. Bradley	SAS Institute	✓	✓	✓	✓	—
707	Alan	Beale	SAS Institute					
333	Larry	Y. Jones	SDRC	✓	✓	✓	✓	✓
305	Donald	Kossman	SEI Information Technology					
511	Kenneth	Harrenstien	SRI International	✓	✓	✓	✓	✓
344	Daniel	Y. Saks	Saks & Associates	✓	✓	✓	✓	✓
084	Nancy	Saks	Saks & Associates					
710	Larry	Y. Rosenthal	Sierra Systems	✓	✓	✓	✓	✓
583	Philip	Hempfer	Southern Bell					
106	Purshotam	Rajani	Spruce Technology					
227	Savu	Savulescu	Stagg Systems					
218	Peter	Y. Darnell	Stellar	✗	✓	✓	✗	✗
94	Lee	Coopridier	Stellar					
45	Paul	Gilmartin	Storage Technology					
75	Courtney	Y. Meissen	Sun Microsystems ("Prodehl")	✓	✓	✓	✓	✓
85	Steve	Muchnick	Sun Microsystems	✓	✓	✓	✓	✓

Alan

Farguison (add)

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M T W T F

425	Chuck.....	Y Rasbold.....	Supercomputer Systems.....	X	X	X	X	X
'83	Kelly.....	Y OHair.....	Supercomputer Systems.....	X	X	X	X	X
37	John M.....	Y Hausman.....	Tandem Computers.....	X	X	X	X	X
941	Henry.....	Richardson..	Tandem Computers	X	X	X	X	X
790	Samuel.....	Harbison....	Tartan Laboratories.....	—	—	—	—	—
756	Michael....	Y Ball.....	TauMetric.....	—	—	—	—	—
915	Carl.....	Y Sutton.....	Tektronix.....	✓	✓	✓	✓	✓
256	Reid.....	Tatge.....	Texas Instruments.....	—	—	—	—	—
081	Ed.....	Brower.....	Tokheim.....	—	—	—	—	—
072	Robert.....	Y Mansfield..	Tokheim.....	—	—	—	—	—
234	Monika.....	Y Khushf.....	Tymlabs.....	—	✓	✓	✓	—
545	Morgan.....	Jones.....	Tymlabs	—	—	—	—	—
337	Don.....	Y Bixler.....	Unisys (Sperry).....	X	X	X	X	X
247	Glenda.....	Berkheimer..	Unisys (Sperry).....	X	X	X	X	X
769	Steve.....	Bartels.....	Unisys (Burroughs).....	X	X	X	X	—
086	Annice.....	Jackson.....	Unisys.....	—	—	—	—	—
021	Fred.....	Blonder.....	Univ of Maryland	—	—	—	—	—
739	Fred.....	Swartz.....	Univ of Michigan.....	—	—	—	—	—
008	R Jordan...	Kreindler..	Univ of Southern Cal (Arlington)	—	—	—	—	—
479	Mike.....	Y Carmody.....	Univ of Waterloo	—	—	—	—	—
140	Douglas...	Y Gwyn.....	US Army.....	✓	✓	✓	✓	✓
733	C Dale.....	Pierce.....	US Army.....	—	—	—	—	—
674	John C.....	Black.....	VideoFinancial.....	—	—	—	—	—
118	Joseph.....	Y Musacchia..	Wang.....	—	—	—	—	—
249	Fred.....	Y Rozakis.....	Wang	✓	✓	✓	✓	✓
165	PJ.....	Y Plauger.....	Whitesmiths Ltd.....	✓	✓	✓	✓	✓
009	Kim.....	Y Leeper.....	Wick Hill Assoc Ltd.....	—	—	—	—	—
'86	Mark.....	Y Wittenberg.	Zehntel.....	—	—	—	—	—
	Mike	Y Bennett	Goold Electronics CSD	✓	✓	✓	✓	✓
	Mike	Eager	Eager Consulting	✓	✓	✓	✓	—
	Lucy	Y Van Leeuwen	MASSCOMP —	✓	✓	✓	✓	✓
	Zona	Walcott	Pyramid Technology	✓	✓	✓	✓	✓
	THEODORE	Y NORVELL	CONTROL DATA DATA	✓	✓	✓	✓	✓
	FRED	CRIGGER	WATCOM	✓	✓	✓	✓	✓