Minutes of the 1994 meeting of SC22/WG5 (Fortran)
Grosvenor Hotel, Grosvenor Street, Edinburgh, Scotland
8 - 12 August 1994

1. Opening of the Meeting

At 9 am the convenor, Jeanne Martin, opened the meeting.

2. Welcome of the delegates

The host, David Muxworthy, welcomed the delegates and explained the local arrangements.

3. Remarks from the Convenor

The convenor noted that the objectives of the meeting are:

- to determine the content of Fortran 95
- to determine the final processing of Varying Strings
- to determine the content of Corrigendum 2

4. Adoption of the Agenda (N1008)

The agenda (N1008) was adopted.

5. Appointments for this meeting

The following appointments were made:

Recording Secretary	Mike Roth
Vice chair .	Bert Buckley
Xeroxing	Fred Hopper
Drafting Committee: Head	David Muxworthy
US	Jerry Wagener
Germany	Karl-Heinz Rotthauser
Japan	Maki Takata
US	Jeanne Adams

6. Approval of the Minutes of the Berchtesgaden Meeting N949 (Kelble)

The minutes of the Berchtesgaden meeting (N949) were adopted.

7. National Activity Reports (Heads of Delegations)

The following National Activity Reports were presented:

Canada	Bert Buckley
Germany	Karl-Heinz Rotthauser (N1030)
Japan	Hideo Wada
Russia	Alla Gorelik

The translations of the Fortran 90 Standard into Japanese and Russian were noted and welcomed.

UK	David Muxworthy (N1026)
USA	Kurt Hirchert (N1027)

8. Recommendation for Withdrawal or Reconfirmation of IRTF

The meeting considered the non-existence of WG1 on IRTF Standards. As there bas been no response to any inquiry on this subject, there was a straw vote to withdraw: 24-0-1

9. Status of the Berchtesgaden Resolutions (Kelble)

Jerry Wagener presented N1029 on responses to resolutions of the WG5 meeting 5 to 9 July 1993.

10. Development Committee Report (Wagener)

Jerry Wagener presented the report of the development committee. This included slides.

11. Long Term Appointments:

Defect Editor	Janice Shepherd
Repository Editor	John Reid

12. Presentation of Suggested Requirements from Member Bodies and Individuals

Jeanne Martin presented N1025, containing slides on the steps to complete the meeting objectives, starting with a summary in Slide 1.

Slide 2 X3J3's Recommendations re B9

N944	C7	derived type I/O	defer to F2000

X3J3 recommends that this item be deferred to the F2000 revision. Accepted.

N966	B2 & C4	IEEE arithmetic	separate binding

Remove conflicts with IEC 559 (IEEE 754/854) and support IEC 559 conforming or similar hardware. X3J3 recommends that WG5 prepare a new work item for a Fortran binding to IEC 559 and drop further consideration of this requirement for the base Fortran standard. Accepted.

N967	B4.3	comments in namelist and list-directed input	drop comments for list-directed input

A proposal, X3J3/94-021, with text to permit comments in namelist input was passed at the February meeting. Because list-directed input data can include undelimited character strings, any facility to permit comments in this data would be quite irregular and error-prone. X3J3 recommends that the list-directed part of this requirement not be pursued further. Accepted.

N968	C3	allow some user-defined functions in declarations	pursue specific new intrinsics, but see N995 (X3J3/009)

WG5 noted that N968 had not completely resolved this issue.

N969	C5	exception handling	defer to F2000

X3J3 recommends that John Reid and IFIP WG2.5 continue developing their exception handling proposal and be accorded agenda time at X3J3 meetings, but with the aim of providing a full-featured facility for Fortran 2000. John Reid presented his slides, N1033, on the enable proposal. This included N995 (page 166 of the pre-meeting band-out). This invoked a discussion on what the handler does if it encounters an exception:

Kurt Hirchert: I do not see all the technical programs resolved in two weeks; this should be deferred to Fortran 2000.

Jamie Shiers: Some could be in Fortran 95 and some in Fortran 2000.

Jeanne Adams: It will take at most one more meeting to complete.

John Reid: In general, names with a global scope are a problem.

Jerry Wagener: If there are no user defined exceptions, would that be a useful subset for Fortran 95?

John Reid: This is possible, but would weaken the proposals.

Straw Vote: Should user-defined names have global scope? 7-5-12

Karl-Heinz Rotthauser: We need exception handling in Fortran 95.

Straw Vote:

1)	Do nothing re exception handling in Fortran 95	4
2)	Put in exception handling but only intrinsic condition	19
3)	Put in the complete proposal	7
4)	Undecided	0

Keith Bierman: 'System' is not portable - all implementors can add their own non-portable things so don't put 'system' into the standard.

N992	B4.1	minimal and exact field width editing	drop exact field width editing

X3J3 recommends that the minimal field width editing requirement (Repository item 9) be pursued and the exact field width editing requirement (Repository item 10) be dropped. Accepted.

N993	C2	KIND parameters for derived types	defer to F2000

X3J3 recommends that. in view of the amount of work still outstanding on category A and B items. no further work be undertaken on this topic for the 1995 revision. X3J3 further recommends that this topic be given a high priority for Fortran 2000. Accepted.

N994	C6	object oriented programming	become major priority for F2000

X3J3 recommends that the individual proposals which have already been put forward and reviewed by the committee be pursued for the upcoming 1995 revision. They further recommend that work on object oriented programming continue as a major priority for Fortran 2000. Accepted.

Adam Marshall (standing in for Lawrie Schonfelder) gave a tutorial on parameterised datatypes, N1035

Straw Vote:

I)	Accept X3J3 recommendation	9
2)	Ask for more work targeting it for Fortran 95	7
3)	Undecided	6

Bert Buckley: Can we do KIND parameters in Fortran 95 without doing the whole proposal?

Jerry Wagener: There is not enough time left to do this.

Slide 3 Remaining unimplemented B9 items

It was agreed that there was too much work involved to get these into Fortran 95.

Slide 4 What is the disposition or remaining repository items?

Item 2. Controlling pointer bounds. X3J3 recommended deferring this to Fortran 2000.

Straw Vote:

1) Fortran 95 0
2) Fortran 2000 5
3) Undecided 13

On Kurt Hirchert's recommendation, the other items on this slide were taken all at once.

Straw Vote: Do none of these in Fortran 95: 14-4-0

Item 8, CONSTANT as a synonym for PARAMETER, was then given its own straw vote:

1) Fortran 95 11
2) Fortran 2000 8
3) Undecided 3

Slide 5 What is the disposition or remaining repository items?

Items 21 to 34 on this slide will also not be done in Fortran 95.

Slide 6 What is the disposition of new repository items?

Only two of these received straw votes:

The work on nested WHERE Statements has already been done in N995.

Straw Vote: Nested WHERE in Fortran 95: 22-0-1

Improvement of the interoperability between Fortran and ANSI C was considered to be of fundamental importance, but we see no way of doing this within a year.

Jeanne Adams: OK but let's start by contacting the C committee and setting up a liaison.

Straw Vote: Are we willing to delay the standard to consider Fortran/C interoperability: 1-15-6

Slide 7 Should these be added to the repository! If so, what is their disposition?

It was unanimously decided to add these items. In particular, there was a straw vote on the optional name on END INTERFACE (N1017) in Fortran 95: 15-0-7.

Slide 8 Are there others to consider?

Straw vote: Double colon in external and intrinsic statements in Fortran 95: 8-1-12

Janice Shepherd requested adding language to Fortran 95 to allow user defined functions to override the added intrinsic in user defined generics: 2-5-15

Malcolm Cohen requested a straw vote to disambiguate generic procedure references as in the example subroutines: S1(A) and S2(B, A): 20-0-2

Slide 10 Major Thrust for Fortran 2000

The major thrust for Fortran 2000 should be C interoperability and all on B9.

Slide 11 Requirements for Fortran 2000

Jon Steidel: Include a mechanism similar to C to allow pointer optimisation.

Slide 12 Steps to finish Varying Strings (part 2 of 1539)

Comments on varying strings and their disposition are contained in N1011 and N1022. It was unanimously agreed that the correction to GET is acceptable.

John Reid: Set up an editorial subcommittee for varying strings. John Reid and David Muxworthy both volunteered for this subcommittee.

Slide 13 Steps to complete draft of Corrigendum 2

Janice Shepherd presented N1034 on the status of defect processing. Corrigendum 2 is N1018. In it, on page 40. the reference to page 140 should read 10.5.1.2.1, not 10.5.1.1

N981 contains the edited Corrigendum 2 items that passed the WG5 ballot (only if edited). It passed a straw vote 19-0-3

N984 contains the corrigendum items, X3J3 approved, ready for WG5.

These items were taken in turn:

No objections to items 00000c or 000001

Number 4: Malcolm Cohen: The description is misleading. Delete the last paragraph before the EDIT. No objection to the edit itself.

No objections to Numbers 7, 12, 79

Alla Gorelik: N1028 contains an objection to Number 87. No objections at this meeting.

No objection to Number 88

Number 122. Kurt Hirchert: Correct the spelling of 'solely'. Otherwise, no objection.

Number 125. Kurt Hirchert. This is not maintenance but a total change. The vote was delayed while Kurt writes up his proposals.

Number 136 was also deferred.

No objections to Numbers 138, 142, 156, 159, 160, 162, 163, 165, 166, 169, 172
Number 174: Bert Buckley: I disagree with the answer but have no objection.
No objection to Number 178.
Jeanne Martin: Do we do another corrigendum?
Yes, but it was agreed that the X3J3 and WG5 ballots should be kept separate.

13. First subgroup session

The committee split into the following subgroups:

- Parameterised Data Types under Adam Marshall
- Allocatable Components under Malcolm Cohen
- Enable under John Reid

Their reports are as follows:
Adam Marshall presented the report of the Parameterised Data Types subgroup: This subgroup came to the conclusion that parameterised data types need to fit in with object oriented programming rather than the other way round. Hence this is to be deferred until object oriented programming is defined.
Malcolm Cohen presented the report of the Allocatable Components subgroup: We believe we have resolved the comments and are preparing a revision of N1014.
John Reid presented the report of the Enable subgroup. These are N1037
The Parameterised Derived Types subgroup then regrouped into the Prioritisation subgroup, looking into the future of Fortran. For example, do we quit, just maintain Fortran or move forward to Fortran 2000? What is the evolutionary model of Fortran 2000: towards object oriented programming, parallel computing or some other direction, or as Jerry Wagener put it, what is the major thrust?
Keith Bierman: For performance, I would choose first parallel programming and second interoperability.
Fred Hopper: We need to do this top down. For example, we need to commission a study group for object oriented programming.
Janice Shepherd: We need performance; object oriented programming will slow down performance.
Fred Hopper: Interoperability should be with standards - not with other languages.
Straw Vote: Do we endorse the report of the parameterised data type subgroup to defer this topic to Fortran 2000: Unanimous.

14. Revisit the corrigendum items in N984

Number 4
Straw Vote:
1) Delete the paragraph before EDIT 8
2) Leave it in 5
3) Accept the response either way 8
Straw Vote: Include Number 4 in Corrigendum 2 without this paragraph 14-4
Straw Vote: Include Number 136 in Corrigendum 2: 13-3-5

15. Second subgroup session

John Reid presented the report of the Enable subgroup: We bad a useful subgroup meeting. The details are not appropriate to a full discussion. We are on target for Fortran 95. A revised document will be edited today and available tomorrow.
Adam Marshall presented the report of the Prioritisation subgroup:
I/O was added to the list.
For parallelism, we should look at other de facto standards.
For object oriented programming, we recommend setting up a subgroup. There will be a resolution to the effect that WG5 investigate the direction the 2000 revision takes. An early draft is N1038.
We also confirmed our intent that Fortran 2000 is a major revision.

16. Initial Processing of Edinburgh Resolutions

David Muxworthy: The drafting committee produced a first draft of the resolutions.
There was some discussion as to whether the resolution on interoperability should or should not be part of the resolution on Fortran 2000.
Straw Vote: Keep interoperability in a separate resolution 5-13-4
Straw Vote: CONSTANT = PARAMETER failed 10-10-3
There followed a discussion on the use of intrinsics (now pure) in declarations.
Straw Vote: Allow double colon in external and intrinsic statement 6-7-10

17. Report on Fortran 2000 Subgroup

Adam Marshall: The Prioritisation subgroup is now called the Fortran 2000 Subgroup. The result of our discussion is N1044.
Keith Bierman: Add 'performance'.
It was pointed out that the main thing we want from object oriented programming is to find out from experts what is needed and meanwhile do not work on items that have a negative impact on it.
Jerry Wagener: WG5 agreed that X3J3 may place X3J3-approved edits into the 1995 draft standard, providing a record is maintained of any such insertions that have not yet been approved by WG5.

18. Future Meetings

Hideo Wada gave some information concerning the Tokyo meeting. He asked how many plan to be there. The answer was seven from outside Japan.
The other 1995 meeting will probably be in the USA but the precise venue is not yet known.

19. Other Technical Items

N1039
Kurt Hirchert presented N1039 on copy in/copy out of target dummy arguments.
Janice Shepherd: The solution given in N984 as defect item number 125, pp 67-69 is better.
Straw Vote:

1)	Accept N984	12
2)	Accept N1039	3
3)	Undecided	4

N1040
Malcolm Cohen presented N1040 on allocatable components in Structures (B3).
Jon Steidel: There may be a problem to deallocate automatically on exit from a procedure.
Malcolm Cohen: This is a pointer problem, not an allocatable problem.
Straw Vote: Should we pursue automatic deallocation now? 9-4-7
Hence there will be a subgroup for this topic.
Straw Vote: Accept N1040: 17-0-3
N1041
Jerry Wagener presented N1041 on elemental references to pure procedures.
Janice Shepherd: This is too big to get into Fortran 95. There is still a lot of work to do on it.
Straw Vote: Does N1041 go into the resolutions for completion in Fortran 95? 1-17-3
N1042
John Reid presented N1042 on the enable proposal.
Fred Hopper: Please point out that INSUFFICIENT_STORAGE is always enabled.
Karl-Heinz Rotthauser: The condition UNDEFINED should be dropped.
.Straw Vote:

1)	Drop UNDEFINED	5
2)	Keep UNDEFINED	8
3)	Undecided	8

It will therefore be kept.
Bert Buckley: Please add an I/O condition: FORMAT_CONVERSION_ERROR. Unanimously rejected.
Ewan Cunningham Rewrite the last sentence after OVERFLOW on page 14 as 'Enabling INTRINSIC may enable OVERFLOW'.
Janice Shepherd: It would be better to delete this sentence. Accepted.
John Reid: Please delete IMMEDIATE.
Straw Vote:

1)	Delete IMMEDIATE	9
2)	Keep it	4
3)	Undecided	11

Straw Vote: Would you vote against the proposal if IMMEDIATE remains? Unanimous no. Keep it.
There followed a discussion on the effect of an error during declarations, including N1047.
Tom Lahey: Straw Vote: Delete I/O from the set of exceptions. 2-11-9. It will therefore be kept.
Straw Vote on N1042 15-1-7

Resolutions
David Muxworthy reported on the progress of the Drafting Committee.
In particular, Resolution 13.2 appoints some new subgroups. There was some discussion on the detailed membership of these subgroups.
Jamie Shiers: Each of these subgroups should have a convenor. He volunteered for both. but expresses a preference for the OOP subgroup.
Fred Hopper introduced a new resolution, N1049 on ISO 9000.
Straw Vote: Include this resolution: 10-5-7
Volunteers: Fred Hopper, Jerry Wagener, Jeanne Martin.
David Muxworthy: Fortran binding to Posix.
X3J3 had recommended a collateral standard on a Fortran binding to the IEEE floating point standard.
Straw Vote:

1)	We note X3J3's recommendation	12
2)	We note and approve it	5
3)	We note and approve and commit work on it	1

Straw Vote: Should we have a resolution which mentions message passing interfaces? 0-5-19
N1032
Hideo Wada presented N1032 on preliminary information on local arrangements for the WG5 meeting in Tokyo.
N1048
David Muxworthy presented N1048 on language evolution (B9 Item B4.2), especially obsolescence.
N1050
It was agreed to add N1050, on use of generic specification on the END INTERFACE statement. to the repository.
N1051
There were minor changes to Corrigendum 2. N1018. These changes are in N1051. This affects Resolution E10.

20. Adoption of Edinburgh Resolutions

David. Muxworthy presented the draft resolutions.
Fred Hopper: Straw Vote: If there is time to put in elemental functions, would WG5 accept them in F95 18-1-4

Resolutions of the WG5 meeting on 8 to 12 august 1994 in Edinburgh, Scotland, UK

E1. Convenorship of WG5
That WG5, in order to ensure timely continuation of Fortran development, requests SC22 to appoint Jeanne Martin as interim Convenor and to encourage the US Member Body to propose a successor as soon as possible.
Unanimous Consent

E2. Translations of ISO 1539:1991
That WG5 welcomes the publication of the Russian language version of ISO 1539:1991 and congratulates Alla Gorelik and Svetlana Drobishevich on translating the standard, and thanks Jerry Wagener for his role in facilitating the work.

Further, that WG5 welcomes the publication of the Japanese national standard JIS X3001-1994 and congratulates the Japanese Industrial Standards Committee on completing this work.
Unanimous Consent

E3. Industrial Real Time Fortran (ISO 7846:1985)
That WG5 recommends to SC22 that the standard for Industrial Real Time Fortran (ISO 7846:1985) be withdrawn.
Unanimous Consent

E4. Appointment of Defect Editor for Fortran
That WG5 requests SC22 to appoint Janice Shepherd to be Defect Editor for Fortran.
Unanimous Consent

E5. Appointment of Editor for Repository of Suggested Requirements
That WG5 appoints John Reid to be the editor of the repository of suggested requirements for future revisions of the Fortran standard (WG5 Standing Document 5).
Unanimous Consent

E6. Strategic Plan for Fortran Standardization
That WG5 reaffirms the Strategic Plan for Fortran Standardization (WG5-N1046).
Unanimous Consent

E7. WG5 Management Committee
That WG5 re-appoints the management committee defined in the Strategic Plan for Fortran Standardization consisting of a representative from the Canadian, German, Japanese, UK and US member bodies and the primary development body.
Unanimous Consent

E8. ISO 9000 Procedures
That WG5 establishes a subgroup to investigate whether WG5 should adopt procedures based on ISO 9000. Those invited to take part in the subgroup are: Fred Hopper (convenor), Jeanne Martin, Jerry Wagener. It is to report to the WG5 convenor by August 31, 1995. Kurt Hirchert is requested to establish an e-mail reflector for the subgroup.
Unanimous Consent

E9. Varying Length Character Strings in Fortran - Processing of DIS 1539-2
That WG5 approves the minor changes to ISO/IEC DIS 1539-2:1994(E) which have been made in response to the comments (WG5-N1011) returned with the successful DIS ballot and which are reported in the Disposition of Comments Report (WG5-N1036r), and appoints Jeanne Martin, John Reid and David Muxworthy to review the final draft and to submit it before October 6, 1994 to ITTF for publication as an International Standard.
Unanimous Consent

E10. Technical Corrigendum 2
That WG5 approves Technical Corrigendum 2 (WG5-N1018 with the corrections detailed in WG5-N1051) for forwarding to the SC22 Secretariat for processing as the second JTC1 Technical Corrigendum for Fortran.
Unanimous Consent

E11. Technical Corrigendum 3
That WG5 requests X3J3 to proceed with maintenance work in developing responses to the remaining defect items; a decision on publication of a third technical corrigendum will be made at the April 1995 WG5 meeting.
Unanimous Consent

E12. Collateral Standard on IEC 559 Arithmetic
That WG5 notes the recommendation from X3J3 (WG5-N966), regarding support for IEC 559 (requirement C4 in Berchtesgaden resolution B9), that this functionality be provided by a collateral standard rather than by features intrinsic to the language. In view of the ENABLE requirement being considered for Fortran 95, WG5 considers additional IEC 559 support to be less imperative than before and records its intent to defer action on this recommendation until a future WG5 meeting.
Unanimous Consent

E13. Deferred Requirements
That WG5 accepts the recommendations from X3J3 that parameterized derived types, object-oriented programming and derived type input/output (respectively items C2, C6 and C7 in Berchtesgaden resolution B9) not be requirements for the 1995 revision of Fortran.
Unanimous Consent

E14. Content of the 1995 Revision
That WG5 requires that the technical content of the next revision of Fortran include:

- the approved items in the Defect Index, with any corrections thereto,
- the approved items in document WG5-N995, that is:
  - MAXLOC & MINLOC enhancements,
  - NAMELIST comments,
  - minimal field widths,
  - FORALL,
  - PURE procedures,
  - object initialization,
  - removal of conflicts with IEC 559,

CPU_TIME,
nested WHERE,
user-defined functions in specifications,

with any corrections thereto,

- the following additional items:
  language evolution items (WG5-N1048)
  ENABLE construct (WG5-N1042),
  allocatable arrays as structure components (WG5-N1040),
  optional generic-spec on END INTERFACE (WG5-N1017).

If the technical work for any item cannot be completed in the time established for submitting the CD, WG5 requests X3J3 to contact the WG5 convenor at the earliest opportunity for resolution of the situation by the WG5 management committee.

Individual vote: 21-2-1 *Country vote: 6-0-0*

E15. Extent of the 2000 Revision

That WG5 reconfirms its intent, as stated in Victoria Resolution V9 and the Strategic Plan for Fortran Standardization, that the 2000 revision of Fortran will be a major revision.

Unanimous Consent

E16. Direction of the 2000 Revision

That WG5 intends that the highest priority for Fortran in the foreseeable future is to maintain leadership in scientific and engineering computing, where performance is significant; those specific requirements that support this objective are the most important.

Otherwise, for a general-purpose language the areas of object-oriented programming and interoperability with non-Fortran environments are important and should be investigated for future versions of Fortran.

WG5 will actively investigate whether object-oriented programming should be the direction the 2000 revision should take and to this end appoints the following subgroup to report to the WG5 convenor, by January 31, 1995, to provide information on which such a decision could be based. Those invited to take part in the subgroup are: Malcolm Cohen, Fred Hopper, Ralph Johnson, David Levine, Jeanne Martin, Lawrie Schonfelder, Jamie Shiers (convenor).

WG5 will actively investigate the most pressing needs for interoperability and to this end appoints the following subgroup to report to the WG5 convenor, by January 31, 1995, the recommended list of such needs. Those invited to take part in the subgroup are: Keith Bierman, Peter Griffiths, Linda O'Gara (convenor), Jamie Shiers.

Kurt Hirchert is requested to establish e-mail reflectors for both subgroups.

A third level of need is refinement of the current version of the Fortran standard in numerous areas, such as completing development of exception handling, completing data abstraction capability, improving language regularity, adding appropriate new data types, and enhancing input/output. It is expected that the 2000 version of the Fortran standard will contain a number of specific refinements or extensions that will be more completely specified at the next two WG5 meetings, in response to user requirements.

Unanimous Consent

E17. Appreciation of Technical Contributions

That WG5 records its thanks to X3J3 for work on maintenance of the international Fortran standard and development of the proposed revised standard, to Lawrie Schonfelder for development of the Varying Length String Module, to John Reid for editing Technical Corrigendum 2 and to the British and German member bodies for their contributions to development.

Unanimous Consent

E18. Vote of Thanks for Support

That WG5 thanks the following organizations for generously supporting the meeting: Scottish Power, Salford Software, NAG, Edinburgh Portable Compilers, Edinburgh University.

Unanimous Consent

E19. Vote of Thanks

That WG5 wishes to express its appreciation to the Convenor (Jeanne Martin), the vice chair (Bert Buckley), the secretary (Mike Roth), the librarian (Fred Hopper), the drafting committee, the host (David Muxworthy on behalf of British Standards Institution) and all the local organizers (particularly Jane Bannon and Graham Barber) for their contributions to the success of the meeting.

Unanimous Consent