8th Jan. 1997

**Evaluation of Miscellaneous Requirements for Fortran2000**

(by Christian Weber)

## 1. Overview

The opinion poll concerning the priority of miscellaneous requirements for Fortran2000 was held within the "misc. subgroup" between Dec. 10th and Dec 24th after some quite lively email discussion. The main technical contents of this email discussion (as far as relevant for the estimate of work to be done by X3J3) has been collected in the latest version of the document "Miscellaneous Requirements for Fortran2000" which is distributed separately.

Fourteen members of the misc subgroup handed in their individual votes concerning the priority of requirements (C. Dedo, W. Clodius, S. Whitlock, M. Cohen, A.C. Marshall, S. Morgan, P. Lignelet, M. v. Waveren, D. Schmitt, C. Weber, M. Hennecke, M. Zuern, U. Kuester, J. Reid), one has sent comments without specific votes (D. Muxworthy), and two countries / member bodies (USA and France) gave their opinion.

The following sections state the results of this opinion poll:

- section 2 contains a summary of the recommendations to WG5 which can be drawn from the results,
- section 3 contains a tabular evaluation (summary) of the individual votes,
- section 4 contains a tabular evaluation of the country votes,
- section 5 contains a full (tabular) display of all the individual voting results.

The individual comments which accompanied the votes were combined and distributed as a separate document.

I hope that these results will help to focus WG5's work for Fortran2000.

## 2. Recommendations to WG5 (+X3J3)

### 2.1 Major Requirements

Within the group of major requirements, i.e. requirements likely to cause a medium to high amount of work to the development body, the following items got the highest vote for inclusion into Fortran2000 (with the numbering indicating the priority sequence):

(1) Exception Handling (item 5.1 in the misc. req. list document, repository entry # 5);

(2) Asynchronous I/O (item 9.10, repository entry # 52)

- note that this topic is already handled by X3J3 as R.2;

(3) Binary Stream I/O (item 9.1, repository entry # 63, 63a);

(4) Bit Data Type / String (item 4.1, repository entry # 21)

- note that this requirement might possibly also be satisfied by some storage-optimized LOGICAL kind together with additional operations / intrinsics for LOGICAL arrays: the priority vote included all possible solutions so far;
- note further that C. Dedo indicates that there might already be a champion for this topic;

(5) Unsigned INTEGER Data Type (item 4.3, repository entry # 37)

- note that C. Dedo volunteers to champion this topic;

C. section 3 for the ranking of the other requirements.

### 2.2 Minor Technical Enhancements to be added

The following minor technical enhancements (MTE's) should be added as work items for Fortran2000 (with the numbering indicating the priority sequence):

(1) Non-advancing I/O combined with free format (item 9.2, repository entry # 63b/65);

(2) Command Line arguments & Environmental Variables (item 10.1, repository entry # 20)

- note that C. Dedo volunteers to champion this topic;

(3) Any Kind of Integer for I/O Specifiers (item 9.3, repository entry # 68)

- note that C. Dedo volunteers to champion this topic;

(4) Intrinsic "size" function for derived types (item 11.4, repository entry # 80).

C. section 3 for the ranking of the other requirements.

Furthermore, there are various minor technical enhancements which have gained considerable support (though less priority weight than the MTE's mentioned above): if a champion should be found for these MTE's, they should be included in F2000 as well.

Candidates for such MTE's could be:

- Variable Repeat Specifiers in Format (item 8.1, repos. # 48):
  C. Dedo volunteers to champion this topic, and he believes that it is only a MTE ;
- Operating System Support (item 10.3, repos. # 86):
  C. Dedo volunteers to champion this topic.

### 2.3 Minor Technical Enhancements possibly to be removed from X3J3's Work Plan

Some MTE's which are already handled by X3J3 (i.e. are already part of X3J3's Work Plan) received a considerable opposition within WG5: there should be a separate vote at the Las Vegas meeting if these topics are really supported by the majority of WG5.

These items are:

- Lower Case Syntax Elements (item 2.2, repos.#67, J3/M3),
- Permit BOZ constants (item 3.2, repos. #69, J3/M8),
- Specifying Default Precisions (item 4.4, repos. #49, J3/M12),
- Named Scratch Files (item 9.4, repos. #73, J3/M10),

- Remove limitation on statement length (item 12.2, repos. #50, J3/M1).

### 2.4 New Requirements

The following new requirements received considerable support (though not very high priority) and should therefore be added to the requirement repository:

- Parallelized SELECT CASE (item 5.4),
- Interfaces to internal & module procedures (item 6.4),
- Initialization programs in modules (item 6.5).

## 3. Results of the individual votes on miscellaneous requirements (Summary)

The table below shows the results of the opinion poll within the misc subgroup:

- column "item" refers to the section nr. within the document "miscellaneous requirements list",
- column "rep #" refers to the entry nr. in the requirement repository,
- column "X3J3 work" refers to the estimated amount of work for X3J3,
- column "X3J3 vote" (Yes:No) refers to the result of the straw votes within X3J3 and the current status within the X3J3 Work Plan,
- the O's / L's / M's / H's columns list the total number of "omit" / "low priority" / "medium priority" / "high priority" votes given for the requirements,
- column "wgt. sm" displays a weighted sum of the O...H votes:
  I counted +2 points for H, +1 point for M, +0 points for L, and -1 points for an opposition expressed by an O vote.

  I think that this might reflect adequately the positive / negative "weight" of the different votes, but if anybody wants to try a different weight function, then I could send him the data as Excel sheet,
- column "prio pts" displays the priority points which everybody could distribute to the *major* requirements (a total of 20 points could be distributed with a maximum of 4 points per item),
- column "maj. rnk" shows the rank of a requirement within the set of major requirements (i.e. requirements causing medium / high amount of work); the first number gives the rank according to the column "prio points", the second number gives the rank according to "wgt. sum".

  I did not work out any ranks for a "wgt. sum" less than zero.
- column "MTE rnk" gives the rank (according "wgt sum") within the set of minor technical enhancements;
  I did not work out any ranks for a "wgt. sum" less than zero.

| item | rep. # | Description | X3J3 work | X3J3 vote | O's | L's | M's | H's | wgt. sm | prio pts | maj rnk | MTE rnk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2. | | General Syntax Enhancements | | | | | | | | | | |
| 2.1 | 7 | Block Comments | sma | No | 13 | | 1 | | -12 | | | |
| 2.2 | 67 | Lower Case Syntax Elements | sma | Yes (M3) | 5 | 5 | 1 | 1 | -2 | | | |
| 2.3 | 92 | Reserved words | sma | No | 9 | 3 | 2 | | -7 | | | |
| 2.4 | new | IMPLICIT NONE by default | sma | | 6 | 5 | | 2 | -2 | | | |
| | | | | | | | | | | | | |
| 3. | | Constants and Expressions | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.1 | 66 | Extend Initialization of COMPLEX Variables | sma | Yes (M17) | 1.5 | 4.5 | 3 | 1 | 3.5 | | | 10 |
| 3.2 | 69 | Permit BOZ constants in the TRANSFER function | sma | Yes (M8) | 4 | 4 | 2 | | -2 | | | |
| 3.3 | 71 | Allow MERGE in constant expressions | sma | Yes (M9) | 3 | 4 | 3 | 2 | 4 | | | 9 |
| 3.4 | 77 | New Special Character designations | med | No | 10 | 4 | | | -10 | 6 | 11 | |
| 3.5 | new | Definable evaluation sequence for logical operations | sma | | 5.5 | 2.5 | 4 | | -1.5 | | | |
| | | | | | | | | | | | | |
| 4. | | Data Types | | | | | | | | | | |
| 4.1 | 21 | Bit Data Type, String | lrg | 4:9 | 2 | 1 | 8 | 3 | 12 | 23 | 4/4 | |
| 4.2 | 34 | Varying length character with declared maximum | lrg | 5:9 | 11 | 1 | 1 | | -10 | 1 | 17 | |
| 4.3 | 37 | Unsigned INTEGER Data Type | med | 6:4 | 2 | 2 | 9 | 1 | 9 | 19 | 5/5 | |
| 4.4 | 49 | Specifying Default Precisions | sma | Yes (M12) | 4 | 7 | 1 | | -3 | | | |
| | | | | | | | | | | | | |
| 5. | | Control Flow Constructs | | | | | | | | | | |
| 5.1 | 5,5a 5b.. | Exception Handling | lrg | 6:8 | 3 | 1 | 3.5 | 6.5 | 13.5 | 35 | 1/3 | |
| 5.2 | 25 | Extend the semantics of the EXIT statement | sma | 5:7 | 8 | 2 | 3 | | -5 | | | |
| 5.3 | new | Real arguments in CASE/FORALL/WHERE | sma | | 10.5 | 0.5 | 2 | | -8.5 | | | |
| 5.4 | new | Parallelized SELECT CASE | med | | 5 | 1.5 | 4.5 | 1 | 1.5 | 13 | 8/7 | |
| | | | | | | | | | | | | |
| 6. | | Procedures | | | | | | | | | | |
| 6.1 | 33 | Nesting of internal procedures | med/lrg | 4:8 | 6 | 4 | 3 | | -3 | 3 | 12 | |
| 6.2 | 42 | Allow internal procedures as actual arguments | med/lrg | 2:11 | 3 | 3 | 3 | 4 | 8 | 17 | 6/6 | |
| 6.3 | 100 | New INTENT attribute: COPY_IN | med | No | 9 | | 5 | | -4 | 11 | 9 | |
| 6.4 | new | Interfaces to internal & module procedures | sma | | 4 | 5 | 3 | 2 | 5 | | | 6 |
| 6.5 | new | Initialization programs in modules | med | | 5.5 | 2.5 | 4 | 1 | 0.5 | 14 | 7/8 | |
| | | | | | | | | | | | | |
| 7. | | Executable Statements | | | | | | | | | | |
| 7.1 | 2 | Controlling Pointer Bounds | sma | Yes (M4) | 4 | 5 | 2 | 1 | 0 | | | |
| 7.2 | 26 | Selecting subarrays of non-rectangular form | med | No | 11 | 3 | | | -11 | | | |
| | | | | | | | | | | | | |
| 8. | | FORMAT processing | | | | | | | | | | |
| 8.1 | 48 | Variable Repeat Specifiers in Formats | med/sma | 3:10 | 5 | 2 | 2 | 2 | 1 | | | 14 |
| | | | | | | | | | | | | |
| 9. | | I/O enhancements | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.1 | 63, 63a | STREAM I/O, Binary stream I/O | lrg | 11:1 | 1 | 1.5 | 6.5 | 5 | 15.5 | 24 | 3/1 | |
| 9.2 | 63b, 65 | Non-advancing I/0 combined with free format, Extend non-advancing I/O to List-Directed I/O | sma | 9:3 | | 1 | 7 | 5 | 17 | | | 1 |
| 9.3 | 68 | Any Kind of Integer for I/O Specifiers | sma | 5:9 | 4 | 3 | 3 | 4 | 7 | | | 3 |
| 9.4 | 73 | Named Scratch Files | sma | Yes (M10) | 7 | 3 | 2 | | -5 | | | |
| 9.5 | 76 | Default I/O mode | med | 3:9 | 6 | 2.5 | 4.5 | | -1.5 | 2 | 14 | |
| 9.6 | 79 | Recognition of TAB characters in Fortran input | sma | No | 6.5 | 3.5 | 2 | 2 | -0.5 | | | |
| 9.7 | 93 | New keywords READ_EOR, READ_EOF, WRITE_EOR, WRITE_EOF in INQUIRE statements | sma | 3:10 | 3 | 5 | 2 | 3 | 5 | | | 6 |
| 9.8 | 94 | New keywords IS_EOR and IS_EOF in INQUIRE, READ and WRITE statements | sma | 3:10 | 3.5 | 5.5 | 1 | 3 | 3.5 | | | 10 |
| 9.9 | 95 | New keywords DEFAULT_READ and DEFAULT_WRITE in INQUIRE statement | sma | 4:7 | 6 | 6 | 1 | | -5 | | | |
| 9.10 | 52 | Asynchronous I/O | med | Yes (R.2) | 1 | | 2 | 7 | 15 | 29 | 2/2 | |
| | | | | | | | | | | | | |
| 10. | | Access to Features of the Environment | | | | | | | | | | |
| 10.1 | 20 | Command Line Arguments and Environmental Variables | sma | 7:7 | 1 | 3 | 4 | 6 | 15 | | | 2 |
| 10.2 | 47 | POSIX Binding to Fortran 90 | lrg | 2:11 | 5 | 5 | 2 | 1 | -1 | 10 | 10 | |
| 10.3 | 86 | Operation System Support | sma | 4:10 | 6 | 1.5 | 2.5 | 3 | 2.5 | | | 12 |
| 10.4 | 99 | Handling of error messages | med | No | 8 | 5 | 1 | | -7 | 3 | 12 | |
| 10.5 | 102 | Primitive graphic facilities in Fortran | lrg | No | 12 | 1 | 1 | | -11 | 2 | 14 | |
| | | | | | | | | | | | | |
| 11. | | New / better Intrinsic functions | | | | | | | | | | |
| 11.1 | 55 | Regularize RANDOM_SEED functionality | sma | 2:11 | 2.5 | 7.5 | 1 | 3 | 4.5 | | | 8 |
| 11.2 | 61 | Generic COUNT_RATE Argument for SYSTEM_CLOCK | sma | Yes (M3) | | 7 | 2 | 2 | 6 | | | 5 |
| 11.3 | 64 | Extend MAX, MIN, etc. to CHARACTER Data Type | sma | Yes (M5) | 2 | 7 | 1 | 1 | 1 | | | 14 |
| 11.4 | 80 | Intrinsic 'size' function for derived types | sma | No | 5 | 2 | 3 | 4 | 6 | | | 4 |
| 11.5 | 81 | Instrinsic 'sort' for arrays of intrinsic type | sma | No | 10 | 2 | | 2 | -6 | | | |
| 11.6 | 82 | Intrinsic function 'fft' - Fast Fourier Transformation | sma | No | 10 | 2 | | 2 | -6 | | | |
| 11.7 | 90 | Four new elemental intrinsic functions: TRUNCATE, ROUND, IBCHNG,ICOUNT | sma | No | 6.5 | 4.5 | 1 | | -5.5 | | | |
| 11.8 | 91 | PATTERN= in bit manipulation functions such as IBCLR, IBSET, IBCHNG | sma | No | 6 | 5 | 1 | | -5 | | | |
| 11.9 | 97 | New transformational functions: POSITION and LOCATION | sma | No | 6 | 4 | 1 | | -5 | | | |
| 11.10 | 98 | New functions to handle arrays: SCRIPT and SCALAR | sma | No | 6 | 3 | 2 | | -4 | | | |
| | | | | | | | | | | | | |
| 12. | | Relaxation of Restrictions | | | | | | | | | | |
| 12.1 | 24, 24a | Remove the restriction on the maximum rank of arrays, Greater than 7 Array Dimensions | sma | Yes (M14) | 3.5 | 5.5 | 1 | 2 | -1.5 | | | 13 |
| 12.2 | 50 | Remove limitation on statement length | sma | Yes (M1) | 5.5 | 3.5 | 1 | 1 | -2.5 | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13. | | Global changes of the Fortran language | | | | | | | | | | |
| 13.1 | new | Creation of a subset language | lrg | | 11 | 3 | | | -11 | | | |
| 13.2 | new | Review implementation-defined / undefined constructs | med | | 6 | 2.5 | 2.5 | 1 | -1.5 | 2 | 14 | |

### 3. Country votes concerning the miscellaneous requirements

Three countries (Germany, USA, France) have distributed some discussion results about priorities of requirements between the Dresden meeting and now. Unfortunateley, none of these country votes fits exactly into the OLMH or point pattern of the individual votes (shown above):

- Germany has had a general discussion on requirements in September, i.e. before the three subgroups had been established properly; therefore only a few of the misc. requirements have been judged, and the judgment does not match fully the OLMH scheme (there will be another DIN meeting in January - so we might have better results then, but I try to map the DIN opinion as best as I can);
- USA (i.e. ANSI X3J3) has made a Yes/No vote only (with count of individual votes), disallowing "Undecided"; I considered items which are (as minor technical enhancements) already included in X3J3's work plan as "Yes";
- France has voted with Yes/No rather than for OLMH priorities (without showing the individual votes), but has distributed 8 "weight points".

I have tried to display these country results in some tabular format:

| item | rep. # | Description | USA: status, Y:N vote | France Y/N + # pts | Germany: gener. opinion |
|---|---|---|---|---|---|
| | | | | | |
| 2. | | General Syntax Enhancements | | | |
| 2.1 | 7 | Block Comments | No | No | |
| 2.2 | 67 | Lower Case Syntax Elements | Yes (M3) | Yes | |
| 2.3 | 92 | Reserved words | No | Yes | |
| 2.4 | new | IMPLICIT NONE by default | | | |
| | | | | | |
| 3. | | Constants and Expressions | | | |
| 3.1 | 66 | Extend Initialization of COMPLEX Variables | Yes (M17) | | |
| 3.2 | 69 | Permit BOZ constants in the TRANSFER function | Yes (M8) | No | |
| 3.3 | 71 | Allow MERGE in constant expressions | Yes (M9) | Yes, 1 pt | |
| 3.4 | 77 | New Special Character designations | No | No | |
| 3.5 | new | Definable evaluation sequence for logical operations | | | |
| | | | | | |
| 4. | | Data Types | | | |

| | | | | | |
|---|---|---|---|---|---|
| 4.1 | 21 | Bit Data Type, String | 4:9 | module | Low |
| 4.2 | 34 | Varying length character with declared maximum | 5:9 | Yes,1 pt | No |
| 4.3 | 37 | Unsigned INTEGER Data Type | 6:4 | No | Med |
| 4.4 | 49 | Specifying Default Precisions | Yes (M12) | No | No |
| | | | | | |
| 5. | | Control Flow Constructs | | | |
| 5.1 | 5,5a 5b,5c | Exception Handling | 6:8 | Yes, 3 pts | High |
| 5.2 | 25 | Extend the semantics of the EXIT statement | 5:7 | No | |
| 5.3 | new | Real arguments in CASE/FORALL/WHERE | | | |
| 5.4 | new | Parallelized SELECT CASE | | | |
| | | | | | |
| 6. | | Procedures | | | |
| 6.1 | 33 | Nesting of internal procedures | 4:8 | Yes | |
| 6.2 | 42 | Allow internal procedures as actual arguments | 2:11 | Yes, 3 pts | No |
| 6.3 | 100 | New INTENT attribute: COPY_IN | No | Yes | |
| 6.4 | new | Interfaces to internal & module procedures | | | |
| 6.5 | new | Initialization programs in modules | | | |
| | | | | | |
| 7. | | Executable Statements | | | |
| 7.1 | 2 | Controlling Pointer Bounds | Yes (M4) | | |
| 7.2 | 26 | Selecting subarrays of non-rectangular form | No | No | |
| | | | | | |
| 8. | | FORMAT processing | | | |
| 8.1 | 48 | Variable Repeat Specifiers in Formats | 3:10 | Yes | Low, only conversion |
| | | | | | |
| 9. | | I/O enhancements | | | |
| 9.1 | 63, 63a | STREAM I/O, Binary stream I/O | 11:1 | Yes | |
| 9.2 | 63b, 65 | Non-advancing I/0 combined with free format, Extend non-advancing I/O to List-Directed I/O | 9:3 | Yes | Med/ High |
| 9.3 | 68 | Any Kind of Integer for I/O Specifiers | 5:9 | No | |
| 9.4 | 73 | Named Scratch Files | Yes (M10) | No | |
| 9.5 | 76 | Default I/O mode | 3:9 | Yes | |
| 9.6 | 79 | Recognition of TAB characters in Fortran input | No | No | Med/ High |

| | | | | | |
|---|---|---|---|---|---|
| 9.7 | 93 | New keywords READ_EOR, READ_EOF, WRITE_EOR, WRITE_EOF in INQUIRE statements | 3:10 | Yes | |
| 9.8 | 94 | New keywords IS_EOR and IS_EOF in INQUIRE, READ and WRITE statements | 3:10 | Yes | |
| 9.9 | 95 | New keywords DEFAULT_READ and DEFAULT_WRITE in INQUIRE statement | 4:7 | Yes | |
| 9.10 | 52 | Asynchronous I/O | Yes (R.2) | | |
| | | | | | |
| 10. | | Access to Features of the Environment | | | |
| 10.1 | 20 | Command Line Arguments and Environmental Variables | 7:7 | Yes | Med |
| 10.2 | 47 | POSIX Binding to Fortran 90 | 2:11 | module or C-Interop | C-Interop only |
| 10.3 | 86 | Operation System Support | 4:10 | ? | No |
| 10.4 | 99 | Handling of error messages | No | Yes | |
| 10.5 | 102 | Primitive graphic facilities in Fortran | No | No | |
| | | | | | |
| 11. | | New / better Intrinsic functions | | | |
| 11.1 | 55 | Regularize RANDOM_SEED functionality | 2:11 | | |
| 11.2 | 61 | Generic COUNT_RATE Argument for SYSTEM_CLOCK | Yes (M3) | Yes | |
| 11.3 | 64 | Extend MAX, MIN, etc. to CHARACTER Data Type | Yes (M5) | No | |
| 11.4 | 80 | Intrinsic 'size' function for derived types | No | | Low |
| 11.5 | 81 | Instrinsic 'sort' for arrays of intrinsic type | No | No | Low |
| 11.6 | 82 | Intrinsic function 'fft' - Fast Fourier Transformation | No | No | No |
| 11.7 | 90 | Four new elemental intrinsic functions: TRUNCATE, ROUND, IBCHNG,ICOUNT | No | Yes | |
| 11.8 | 91 | PATTERN= in bit manipulation functions such as IBCLR, IBSET, IBCHNG | No | Yes | |
| 11.9 | 97 | New transformational functions: POSITION and LOCATION | No | Yes | |
| 11.10 | 98 | New functions to handle arrays: SCRIPT and SCALAR | No | Yes | |
| | | | | | |
| 12. | | Relaxation of Restrictions | | | |
| 12.1 | 24, 24a | Remove the restriction on the maximum rank of arrays, Greater than 7 Array Dimensions | Yes (M14) | No | |

| | | | | | |
|---|---|---|---|---|---|
| 12.2 | 50 | Remove limitation on statement length | Yes (M1) | No | |
| | | | | | |
| 13. | | Global changes of the Fortran language | | | |
| 13.1 | new | Creation of a subset language | | | |
| 13.2 | new | Review implementation-defined/undefined constructs | | | |

## 5. Detailed Results of the individual votes

This section contains the results of the individual votes in detail. The columns indicate the names of the misc. subgroup members:

### 5.1 Individual votes concerning the priority class (O, L, M, H):

| item | repos # | Description | X3J3 work | Dedo (1) | Clodius | Weber | Cohen | Whitlock | Wavereen | Hennecke | Zuern | Kuester | Marshall | Schmitt | Lignelet | Morgan | Reid |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | |
| 2. | | General Syntax Enhancements | | | | | | | | | | | | | | | |
| 2.1 | 7 | Block Comments | sma | O | O | O | O | O | M | O | O | O | O | O | O | O | O |
| 2.2 | 67 | Lower Case Syntax Elements | sma | X | O | L | L | - | O | M | L | L | O | L | H | O | O |
| 2.3 | 92 | Reserved words | sma | O | O | O | O | O | O | O | L | L | O | M | M | O | L |
| 2.4 | new | IMPLICIT NONE by default | sma | L | L | O | | O | O | O | L | L | H | H | O | L | O |
| | | | | | | | | | | | | | | | | | |
| 3. | | Constants and Expressions | | | | | | | | | | | | | | | |
| 3.1 | 66 | Extend Initialization of COMPLEX Variables | sma | X | H | L | OL | - | O | L | M | M | M | L | - | L | L |
| 3.2 | 69 | Permit BOZ constants in the TRANSFER function | sma | X | M | M | L | - | O | L | O | O | L | - | O | | L |
| 3.3 | 71 | Allow MERGE in constant expressions | sma | X | O | H | M | - | O | L | L | L | L | M | H | O | M |
| 3.4 | 77 | New Special Character designations | med | O | O | O | O | O | O | L | L | L | O | L | O | O | O |
| 3.5 | new | Definable evaluation sequence for logical operations | sma | O | M | L | OL | O | O | - | M | M | O | M | - | L | O |
| | | | | | | | | | | | | | | | | | |
| 4. | | Data Types | | | | | | | | | | | | | | | |
| 4.1 | 21 | Bit Data Type, String | lrg | H | M | M | M | O | M | M | M | M | H | M | L | H | O |
| 4.2 | 34 | Varying length character with declared maximum | lrg | | O | O | O | O | O | O | O | O | O | L | M | O | O |
| 4.3 | 37 | Unsigned INTEGER Data Type | med | H | M | M | L | O | M | M | M | M | M | M | L | M | O |
| 4.4 | 49 | Specifying Default Precisions | sma | X | L | O | O | - | M | O | L | L | L | L | L | L | O |
| | | | | | | | | | | | | | | | | | |
| 5. | | Control Flow Constructs | | | | | | | | | | | | | | | |
| 5.1 | 5,5a 5b.. | Exception Handling | lrg | H | MH | H | O | O | H | M | M | M | H | L | H | H | O |
| 5.2 | 25 | Extend the semantics of the EXIT statement | sma | M | OL | L | O | O | O | - | M | M | O | OL | O | O | O |
| 5.3 | new | Real arguments in CASE/FORALL/WHERE | sma | | OL | O | O | O | O | O | M | M | O | O | O | O | O |
| 5.4 | new | Parallelized SELECT CASE | med | | M | L | O | O | H | O | M | M | O | LM | - | M | O |
| | | | | | | | | | | | | | | | | | |
| 6. | | Procedures | | | | | | | | | | | | | | | |
| 6.1 | 33 | Nesting of internal procedures | med/lrg | O | L | L | L | O | M | O | O | O | M | - | M | L | O |
| 6.2 | 42 | Allow internal procedures as actual arguments | med/lrg | H | M | O | H | O | L | O | L | L | M | - | H | M | H |
| 6.3 | 100 | New INTENT attribute: COPY_IN | med | O | O | O | O | O | O | M | M | M | M | O | M | O | O |
| 6.4 | new | Interfaces to internal & module procedures | sma | H | M | L | O | M | O | M | L | L | O | H | L | L | O |
| 6.5 | new | Initialization programs in modules | med | L | M | H | OL | O | O | - | M | M | O | L | M | O | O |
| | | | | | | | | | | | | | | | | | |
| 7. | | Executable Statements | | | | | | | | | | | | | | | |
| 7.1 | 2 | Controlling Pointer Bounds | sma | X | L | M | L | - | L | H | O | O | O | L | O | L | M |
| 7.2 | 26 | Selecting subarrays of non-rectangular form | med | O | O | L | O | O | L | O | O | O | O | O | O | L | O |
| | | | | | | | | | | | | | | | | | |
| 8. | | FORMAT processing | | | | | | | | | | | | | | | |
| 8.1 | 48 | Variable Repeat Specifiers in Formats | med/sma | H | O | M | O | O | H | O | L | L | H | - | M | | O |
| | | | | | | | | | | | | | | | | | |
| 9. | | I/O enhancements | | | | | | | | | | | | | | | |
| 9.1 | 63, 63a | STREAM I/O, Binary stream I/O | lrg | H | H | H | LM | M | L | M | H | H | M | O | M | M | M |
| 9.2 | 63b, 65 | Non-advancing I/0 combined with free format, Extend non-advancing I/O to List-Directed I/O | sma | H | M | H | M | M | M | - | H | H | H | M | M | L | M |
| 9.3 | 68 | Any Kind of Integer for I/O Specifiers | sma | H | O | O | L | O | M | H | H | H | M | M | O | L | L |
| 9.4 | 73 | Named Scratch Files | sma | X | O | L | L | - | L | O | M | M | O | O | O | O | O |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.5 | 76 | Default I/O mode | med | O | O | O | L M | O | M | - | M | M | L | O | M | O | L |
| 9.6 | 79 | Recognition of TAB characters in Fortran input | sma | M | O | M | OL | O | O | L | H | H | O | L | O | O | L |
| 9.7 | 93 | New keywords READ_EOR, READ_EOF, WRITE_EOR, WRITE_EOF in INQUIRE statements | sma | L | O | M | M | O | L | L | H | H | | L | H | O | L |
| 9.8 | 94 | New keywords IS_EOR and IS_EOF in INQUIRE, READ and WRITE statements | sma | L | O | M | OL | O | L | L | H | H | | L | H | O | L |
| 9.9 | 95 | New keywords DEFAULT_READ and DEFAULT_WRITE in INQUIRE statement | sma | O | O | O | L | O | L | O | L | L | | L | M | O | L |
| 9.10 | 52 | Asynchronous I/O | med | H | H | M | | - | H | H | H | H | H | - | - | O | M |
| | | | | | | | | | | | | | | | | | |
| 10. | | Access to Features of the Environment | | | | | | | | | | | | | | | |
| 10.1 | 20 | Command Line Arguments and Environmental Variables | sma | H | L | H | L | M | M | M | H | H | H | L | H | O | M |
| 10.2 | 47 | POSIX Binding to Fortran 90 | lrg | H | O | O | M | O | L | O | L | L | L | - | M | L | O |
| 10.3 | 86 | Operation System Support | sma | H | O | O | M | O | L | M | H | H | O | L M | - | O | O |
| 10.4 | 99 | Handling of error messages | med | O | O | O | L | O | O | L | L | L | O | L | M | O | O |
| 10.5 | 102 | Primitive graphic facilities in Fortran | lrg | O | O | M | O | O | O | O | O | O | O | L | O | O | O |
| | | | | | | | | | | | | | | | | | |
| 11. | | New / better Intrinsic functions | | | | | | | | | | | | | | | |
| 11.1 | 55 | Regularize RANDOM_SEED functionality | sma | L | O | H | OL | O | L | H | L | L | M | L | L | L | H |
| 11.2 | 61 | Generic COUNT_RATE Argument for SYSTEM_CLOCK | sma | X | L | M | L | - | H | - | L | L | M | L | L | L | H |
| 11.3 | 64 | Extend MAX, MIN, etc. to CHARACTER Data Type | sma | X | L | L | L | - | L | L | L | L | H | - | O | O | M |
| 11.4 | 80 | Intrinsic 'size' function for derived types | sma | H | O | H | O | O | M | L | H | H | M | L | M | O | O |
| 11.5 | 81 | Instrinsic 'sort' for arrays of intrinsic type | sma | O | O | L | O | O | O | L | H | H | O | O | O | O | O |
| 11.6 | 82 | Intrinsic function 'fft' - Fast Fourier Transformation | sma | O | O | L | O | O | O | L | H | H | O | O | O | O | O |
| 11.7 | 90 | Four new elemental intrinsic functions: TRUNCATE, ROUND, IBCHNG,ICOUNT | sma | O | O | L | OL | O | L | - | L | L | | O | M | O | O |
| 11.8 | 91 | PATTERN= in bit manipulation functions such as IBCLR, IBSET, IBCHNG | sma | O | O | L | L | O | L | - | L | L | | O | M | O | O |
| 11.9 | 97 | New transformational functions: POSITION and LOCATION | sma | O | O | L | O | O | L | - | L | L | | - | M | O | O |
| 11.10 | 98 | New functions to handle arrays: SCRIPT and SCALAR | sma | O | O | L | O | O | M | - | L | L | | - | M | O | O |
| | | | | | | | | | | | | | | | | | |
| 12. | | Relaxation of Restrictions | | | | | | | | | | | | | | | |
| 12.1 | 24, 24a | Remove the restriction on the maximum rank of arrays, Greater than 7 Array Dimensions | sma | X | L | O | L | - | M | O | L | L | H | OL | O | L | H |
| 12.2 | 50 | Remove limitation on statement length | sma | X | O | O | OL | - | M | - | L | L | H | L | O | O | O |
| | | | | | | | | | | | | | | | | | |
| 13. | | Global changes of the Fortran language | | | | | | | | | | | | | | | |
| 13.1 | new | Creation of a subset language | lrg | O | L | O | O | O | O | O | L | L | O | O | O | O | O |
| 13.2 | new | Review implementation-defined / undefined constructs | med | M | O | - | - | M | O | O | L | L | O | L M | H | O | O |

(1) C. Dedo did not vote for items which are already in the X3J3 Plan (I placed "X" there)

## 5.2 Individual votes concerning the "priority points" for the major requirements:

| item | repos # | Description | X3J3 work | Dedo | Clodius | Weber | Whitlock | Waveren | Hennecke | Zuern | Kuester | Marshall[1] | Schmitt | Lignelet | Morgan | Reid | sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | |
| 3. | | Constants and Expressions | | | | | | | | | | | | | | | |
| 3.4 | 77 | New Special Character designations | med | | | | | | 1 | 2 | 2 | | 1 | | | | 6 |
| | | | | | | | | | | | | | | | | | |
| 4. | | Data Types | | | | | | | | | | | | | | | |
| 4.1 | 21 | Bit Data Type, String | lrg | 4 | 2 | 2 | | 4 | 1 | 2 | 2 | 4 | | | 2 | | 23 |
| 4.2 | 34 | Varying length character with declared maximum | lrg | | | | | | | | | | 1 | | | | 1 |
| 4.3 | 37 | Unsigned INTEGER Data Type | med | 3 | 1 | 2 | | 2 | 3 | 2 | 2 | | 3 | | 1 | | 19 |
| | | | | | | | | | | | | | | | | | |
| 5. | | Control Flow Constructs | | | | | | | | | | | | | | | |
| 5.1 | 5,5a 5b.. | Exception Handling | lrg | 3 | 4 | 4 | | 4 | 3 | 2 | 2 | 4 | 2 | 4 | 3 | | 35 |
| 5.4 | new | Parallelized SELECT CASE | med | | 1 | | | 4 | | 2 | 2 | | 2 | | 2 | | 13 |
| | | | | | | | | | | | | | | | | | |
| 6. | | Procedures | | | | | | | | | | | | | | | |
| 6.1 | 33 | Nesting of internal procedures | med/lrg | | | | | | | | | 2 | 1 | | | | 3 |
| 6.2 | 42 | Allow internal procedures as actual arguments | med/lrg | | 3 | | | | | | | 2 | 1 | 4 | 3 | 4[3] | 13 |
| 6.3 | 100 | New INTENT attribute: COPY_IN | med | | | | | | 3 | 2 | 2 | 2 | | 2 | | | 11 |
| 6.5 | new | Initialization programs in modules | med | | 2 | 3 | | | | 2 | 2 | | 1 | 4 | | | 14 |
| | | | | | | | | | | | | | | | | | |
| 7. | | Executable Statements | | | | | | | | | | | | | | | |
| 7.2 | 26 | Selecting subarrays of non-rectangular form | med | | | | | | | | | | | | 2 | | 2 |
| | | | | | | | | | | | | | | | | | |
| 8.1[2] | 48 | Variable Repeat Specifiers in Formats | sma | 2[2] | | | | | | | | | | | | | (2) |
| | | | | | | | | | | | | | | | | | |
| 9. | | I/O enhancements | | | | | | | | | | | | | | | |
| 9.1 | 63, 63a | STREAM I/O, Binary stream I/O | lrg | | 3 | 3 | 4 | | 4 | 2 | 2 | 2 | | 1 | 3 | | 24 |
| 9.5 | 76 | Default I/O mode | med | | | | | | | | | | 1 | 1 | | | 2 |
| 9.10 | 52 | Asynchronous I/O | med | | 3 | 2 | 4 | 4 | 4 | 2 | 2 | 4 | | | 4 | | 29 |
| | | | | | | | | | | | | | | | | | |
| 10. | | Access to Features of the Environment | | | | | | | | | | | | | | | |
| 10.1[2] | 20 | Command Line Arguments and Environmental Variables | sma | 3[2] | | | | | | | | | | | | | (3) |
| 10.2 | 47 | POSIX Binding to Fortran 90 | lrg | 3 | 1 | | | | | 2 | 2 | | 2 | | | | 10 |
| 10.3[2] | 86 | Operation System Support | sma | 2[2] | | | | | | | | | | | | | (2) |
| 10.4 | 99 | Handling of error messages | med | | | | | | 1 | | | | 1 | 1 | | | 3 |
| 10.5 | 102 | Primitive graphic facilities in Fortran | lrg | | | | | | | | | | 2 | | | | 2 |
| | | | | | | | | | | | | | | | | | |
| 11. | | New / better Intrinsic functions | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| 13. | | Global changes of the Fortran language | | | | | | | | | | | | | | | |
| 13.1 | new | Creation of a subset language | lrg | | | | | | | | | | | | | | |
| 13.2 | new | Review implementation-defined/undefined constructs | med | | | | 1 | | | | | | 1 | | | | 2 |

(1) A.C. Marshall did not assign points, but HMLO classifications also in the second table; I mapped these to points as follows: H = 4 pts, M = 2 pts, L/O = 0 pts, which yielded 20 pts altogether.

(2) Craig Dedo assigned some points to items which were - because of the small work effort estimated - not on the list of the "medium to large" requirements.

(3) John Reid gave all 20 points to this item, but since only a maximum of 4 points was admitted, I inserted this maximum.