Meeting of ISO/IEC JTC1/SC22/WG5
CEC Joint Research Center
Ispra, Italy

July 10-14, 1989

1. REGISTRATION

2. OPENING OF THE MEETING

The meeting was opened on Monday, July 10, 1989 by the Convenor Jeanne Martin.

3. WELCOMING OF THE DELEGATES

Dr. Jean-Pierre AUBINEAU, Head of the Informatics Centre of the CEC Joint Research Center, welcomed the delegates.

A total of 33 delegates were present representing 11 member bodies:

Austria (1)
Canada (3)
European Community (3)
France (1)
Germany (2)
Japan (1)
India (1)
Netherlands (1)
Sweden (1)
United Kingdom (7)
United States (12)

See the list of delegates, Document N427.

As Chairperson, J. Martin welcomed the delegates. She reminded those present of the objective of the meeting and urged everyone to work towards that end.

She informed the group that F. Milinazzo will prepare an informal report of the meeting and J. Wilson will look after the document register.

4. ADOPTION OF THE AGENDA

The Chair requested that:

a. Approval of the Minutes of the Halifax Meeting be inserted under Item 15; and
b. Item 29 be placed after Item 26.

J. Adams requested more agenda time to discuss procedural matters. This was added as Item 20a.

G. Warren requested time to discuss two issues. This was added as Item 18h.

G. Schmitt (Warren) moved that the agenda be adopted as amended.

5. APPOINTMENT OF THE DRAFTING COMMITTEE

A Drafting Committee, responsible for presenting resolutions at this meeting, was appointed. The consisted of D. Muxworthy (Chairman), G. Schmitt, B. Buckley, W. Walter, J. Wagener, H. Matsuo, L. ter Haar, J. Adams, and K. Hirchert.

The Chair reminded delegates of how the Drafting Committee functions. Either people draft their own resolutions or they express their opinions to the Committee.

6. **REPORT FROM THE TOKYO SC22 AG MEETING (SCHMITT)**

G. Schmitt and B. Meek attended the SC22 advisory group meeting in Tokyo. SC22 is very supportive of what WG5 has done. Document N398 contains the relevant information. In summary, SC22 urges WG5:

a. to set the document out quickly;
b. to insure a single Fortran standard; and
c. to have a draft of S8 ready by this WG5 meeting.

G. Schmitt noted that Item c, which was a compromise to give X3J3 more time, has not happened. It is not clear where the problem lies. He urged WG5 to investigate.

(Burch) Was S8.112 not circulated to WG5?
(Adams) Not by SC22.

7. REPORT FROM WG5 LIAISON TO X3J3 (SCHMITT)

In compliance with P6 from the Paris meeting, G. Schmitt attended the November 1988 meeting of X3J3. A full report is given in N399. Several points concerning the liaison are worth noting:

a. The liaison was warmly welcomed by X3J3. X3J3 appreciated knowing first hand the wishes of WG5;
b. X3J3 worked very hard to complete work on the standard in compliance with P2; and
c. although other things were added, the result of their efforts is acceptable to the international community.

8. PROGRESS OF ANSI STANDARD (ADAMS)

A full report is contained in N397.

8.1 Status:

a. A formal request to release S8.112 to SC22 has gone to X3;
b. S8.112 has been released by X3 to SC22;
c. A summary of changes from S8.104 to S8.112 together with a rationale document has been sent to X3; and
d. X3 has established July 27-Nov 24 as the dates for the public review. There have been minor problems in getting the document published.

8.2 Publication of the Draft Standard

(Meissner) An editorial has appeared in the Fortran Forum. Both F66 and F77 were published in ACM as a service, however X3 has decided to sell Draft Standard instead.

A proposal to publish S8.112 in the ACM was presented by L. Meissner.

It was noted that it would be difficult to obtain permission.

(Adams) Global Engineering has been asked to improve the quality of their publication.

(Warren) Can each of us reproduce the document?

(Meissner) Yes?

(Warren) Can the document we reproduce be S8.112 or does it have to be the SC22 document?

(Adams) Do whatever you want?

(Ellis) The UK distributed S8.112 not the SC22 document.

(Lahey) Will write asking ACM to publish the document in the communications.

(Burch) Suggested going around CBEMA to get the process changed. A resolution to this effect may be in order.

(Adams) X3J3 really has taken the initiative to complete the work.

A resolution proposing the synchronization of the ANSI and ISO standardization process would be welcome.

8.3 Synchronization

Each WG5 country is asked to collect edits and forward them to the appropriate X3J3 subgroup heads by October 1st. The January meeting will only deal with major technical issues.

It was noted that a better method of organization will be necessary for standardization in the future.

8.4 Liaison with X3J3

A liaison between WG5 and X3J3 should be provided on a meeting by meeting basis. The Chair thanked G. Schmitt for a job well done.

WG5 must decide whether the liaison should be an X3J3 member.

(Schmitt) It works best with an X3J3 member as the liaison.

9. PROGRESS OF ISO STANDARD (MARTIN)

The Chair asked for a resolution expressing how WG5 feels about S8.112 and whether we want an SC22 vote.

We can have a four-month ballot which can start anytime after the draft is received by SC22. Minor editorial changes will go in with the US comments. Processing them this way keeps the two documents aligned.

(Ellis) What happens at the close of the SC22 ballot?

(Martin) The change document is S8.113. WG5 and X3J3 decide if the change is substantial enough to require another SC22 ballot or even another US public review. This can be overridden by X3.

(Adams) S8.113 will not be enough to letter ballot. However, after the January meeting substantial changes will require public review.

(Johnson) The committee can decide if the changes are minor enough.

(Martin) There is JTC1 ballot after this.

10. NATIONAL ACTIVITY REPORTS

Austria (Schmitt) -Document N400

Austria supports a single worldwide standard. The Standard was reviewed in detail by subgroups.

Canada (Warren) -Document N412

The Canadian Working Group currently has 12 members and we have had three meetings this year. We are very appreciative of the effort that X3J3 has made. The Canadian position on the document is generally positive. We are opposed to subsetting.

France (Mas) - N421

The French Working Group currently has 10 members. We would like to thank X3J3 for the work that have put into the document. Generally we are in favour of the document. France is in favour of single worldwide standard. We suggest an editorial method to distinguish F77 from F88.

Germany (Rotthauser) -N420

The German Group currently has 9 members. We have held three meetings this year. Germany voted yes on the WG5 letter ballot. Germany prefers a single worldwide standard. We still have several specific

concerns on the implementation of "Variable Length Strings". A paper on extensions has be submitted and is to be considered under Item 18.

India (Mahabala)

India is in the process of forming a group. India supports a single worldwide standard. Multibyte character sets are important to India.

Japan (Matsuo) - Document N417

The Japanese Group currently has 15 members. We hold one meeting per month. Currently representation is sent to X3J3 meetings. The issue of "Multibyte Characters" is of great concern. There is a liaison with China on this issue. Japan will align its standard with the ISO standard.

European Community (Pollicini) - Document N389

The EEC has held seminars at the JRC which were open to the general public. There is an ongoing effort to form an Italian delegation. A document in Italian was circulated within the centre.

(Martin) Mr. Cote will write to countries asking for participation.

Netherlands (ter Haar) - Document N423

The Dutch Group has 10 active members and meets about four or five times a year. The document was reviewed and publications have been placed in magazines. The Netherlands supports a single worldwide standard and appreciates the work of X3J3. We will vote for subsetting if it solves problems for X3J3.

Sweden (Dahlstrand) - No activity to report

UK (Muxworthy) -Document N406

The British Fortran group currently has 14 active members. We support a single worldwide standard. We have serious concerns about some of the features that have been recently added to the Standard. M. Ellis attended a joint meeting of SC2, SC22 and SC21/WG3 (see Document N383) on multiple character sets. In the UK there is much interest in the development of Fortran. The UK Fortran experts group meets regularly.

US (Johnson) - Document N407

The ANSI committee for Fortran, X3J3, met three times since the last WG5 meeting. On average about 50 people attend. The US had its own letter ballot so it didn't contribute to the WG5 ballot. Detailed responses to the first public review have been completed. Some work has been done on interpretation.

11. OVERVIEW OF CURRENT PROPOSAL (JOHNSON)

Document N419 gives the following overview of the draft proposal.

General:
- "[" "]" have been removed from the Fortran character set
- the concept of "deprecation" has been removed
- blanks are significant
- "include" has been added in a restricted way

Arrays
- Range/set, Identify/Alias have been removed
- ALLOCATABLE was removed (then put back)
- the array constructor "do" syntax has been changed

Types
- KIND= has been added for some types
- a KIND= modifier has been added for literal constants
- the TYPE parameter has been removed
- REAL (*,*) has been removed
- POINTER/TARGET attributes have been added
    - implicit dereferencing
    - no implicit initialization
- SEQUENCE structures have been added

Procedures
- one level internal procedure have been retained
- MIL-STD 1753 Bit Intrinsic functions have been added
- Generic overloading has been accomplished by way of INTERFACE Blocks

Statements
- DO WHILE has been added

INPUT/
OUTPUT
- bit B,O,Z edit descriptors have been added
- Non-advancing I/O has been added

12. RECURRING THEMES IN US PUBLIC REVIEW (WAGENER)

Document N403 lists the recurring themes together with a summary of the public comment. These major recurring themes were put into categories by subgroups. Of the 40 themes identified, X3J3 acted on 30 of them. Of the 40, only in 5 was the comment opposed rather than in favour. The results show that there is support for individual features. There was no advice on how to make changes.

13. PROCESSING OF THE US PUBLIC REVIEW (BURCH)

The responses to the public review are in the process of being mailed. There are 462 letters. It will be necessary to form a new sub-group as a number of people currently working in this sub-group are leaving.

14. LIAISON REPORTS - None

15. APPROVAL OF THE MINUTES OF THE PARIS MEETING

(Warren) There was no appreciation shown to J. Wilson for producing the Minutes.

(Johnson) Some scribe notes are missing.

The Chair expressed the appreciation of WG5 to J. Wilson for producing the Minutes.

Johnson (Warren) moved that the Minutes of the Paris Meeting be approved.

Johnson (Warren) moved that the Minutes of the Halifax Meeting be approved.

16. STATUS OF PARIS RESOLUTIONS (WAGENER)

A current official document outlines the X3J3 response to the Paris resolutions as of November. What is being presented here has not been passed by X3J3. The Paris resolutions together with their current status is presented in Document N404. X3J3 has responded to all Paris resolution except P4. X3J3 has not adopted Fortran 88 in place of Fortran 8X.

X3J3 has complied with Paris resolution P2 except for the following points:

a. the removal of internal procedures, the change of Host Association to Use Association in module procedures was rejected,
b. NAIO was introduced instead of stream I/O; and
c. B,O,Z constants in data statements and B,O,Z edit descriptors were added.

(Walter) This only applies to integers.

(Muxworthy) What happened to resolutions not directed to X3J3?

(Martin) They appear in the agenda and will be discussed later this week.

17. DISPOSITION OF THE PARIS RESOLUTIONS (COHEN)

See Document N422. The examples were checked for correctness:

a. an "and" is missing in Chapter 5; and
b. the keyword "logical" is misspelled.

18. ISSUES ARISING FROM BALLOT COMMENTS ON N357

a. Non-Advancing I/O (Meissner)

The discussion was based on document N411, Partial-Record Input and Output, by L. Meissner which appeared in the ACM Fortran Forum August 1989.

There was a long discussion concerning the inability to distinguish between EOR and EOF. The source of the problem is that while IOSTAT takes on different values for these two conditions, there is no way to determine what these values are on a particular implementation. A number of remedies were discussed.

(Warren) There are no examples of NAIO in the document, especially in these odd cases.

(Schonfelder) NAIO is inconsistent with F77.

(Buckley) I have two questions. If NAIO is used for interactive work on a terminal, there is no obligation to write the record. What happens if an EOR is never written to the record?

This question is directed to the German group. Are you happy with this?

(Walter) Yes. It has been used to build a variable length sting module. However, we would also like to question EOR on write as well as read.

(Buckley) Is it clear whether EOR is counted? This should be read by a UNIX person by by clarity.

(Burch) Count is over records. What happens if tabbed back?

(Tait) What is the difference between SIZE and VALUES?

(Schonfelder) Much the same. There is no other way to count the number of characters.

(Hirchert) We need to find where EOR occurred from a single read.

(Burch) SIZE is much weaker than VALUES and it is well defined.

(Hirchert) It is a question of what is a data transfer as used by the left tab limit.

b. Character Handling in Fortran 88 (Ellis)

SCRIBE: A. TAIT

Reference: Document N384

(Walter) Can you compare character strings of different kinds?

(Ellis) No, you could define the required coercions but we thought it would not be particularly useful.

(Paul) Why 1993? (See N384, page 4.)

(Ellis) We had to put in a date and we thought that this allowed a reasonable period in which to do the work.

(Schonfelder) How is the user going to specify the set of letters? (See N384, page 7.)

(Ellis) By the means specified by the processor.

(Schonfelder) This is not particularly useful.

(Ellis) Yes it is, you have misunderstood and I have to make some corrections to these notes. We are just saying that the means must be provided. How it is done is up to the processor.

(Johnson) It is only user defined in the sense that the user says what he wants.

(Paul) This is not really specifying it. We are not providing a dynamic facility; we are fooling ourselves

(Ellis) Agreed, we think market forces will ensure that it is done correctly.

(Paul) I want to change character sets between runs and having to re-install the compiler is not acceptable. We should allow this option.

(Tait) This is not portable and it never has been.

(Ellis) It is not, but it is what people seem to want.

(Buckley) What happens if a French colleague writes a standard conforming program using French, will it work on my machine in Canada?

(Ellis) Probably not.

(Burch) It depends on the internal representation. As part of the file transfer you would have to do a context translation which is rather fanciful. It is one of those things that is not portable, but is necessary.

(Schmitt) You have specified alphabetic sequence, what does this mean since there are, for example, four ways of sorting the umlaut? This gives the implementor too much freedom. (See N384, page 9.)

(Ellis) The alphabetic sequence is solely for the IMPLICIT statement. But you are right, two different users could specify different collating sequences for the same thing.

(Johnson) You have to specify a way of doing the translation.

(Mahabala) 10646 specifies a way and you should use this.

(Ellis) 10646 specifies an order which is not necessarily good, particularly for European languages.

(Mahabala) We run the risk of having different methods for printing and interpretation.

(Ellis) It is a problem.

(Schonfelder) This is very disturbing. We have taken the lid off another Pandora's box. It will take 18 months to get it right; it is too late. We cannot solve the problems this late in the game without delaying the standard.

(Warren) There is not enough specification in the draft.

(Ellis) Yes, at least editorial comment is required.

(Warren) Presumably two-thirds of J3 supported this?

(Ellis) Yes.

(Hirchert) Mixed feelings. We are trying to isolate the properties of an alphabet. If you know the properties you can use them.

(Tait) The assertion that programmers will avoid the portability problems if they want portability is false. They are not typically aware of these issues.

(Burch) Why was this allowed in violation to Jeanne's (Adams) directive about no new work?

(Ellis) Character was exempt.

(Burch) Does 10646 specify a means of switching between alphabets?

(Ellis) Yes.

(Burch) Are shift codes specified?

(Ellis) Yes.

(Buckley) I am concerned about the time-frame. This has gone in at the eleventh hour and it will delay the standard. I would like to hear from the non-anglophones what they feel.

(Walter) In comments, not in identifiers.

(Buckley) The problem is in the source code.

(Schonfelder) 10646 seems to have ASCII in the bottom seven bits.

(Ellis) No. (A summary of 10646 followed.)

(Schonfelder) The same set of escape characters must appear in all character sets to allow escape from one set to another.

(Ellis) There are common control characters, but no common graphics

(Schmitt) SC22 has not discussed this, there will be discussion in Berlin. I am concerned we are wasting time providing a poor solution because we do not have time to do it properly and the required support standards do not exist yet. Having, for example, German names is desirable but not essential.

(Dahlstrand) We have the same problems as the Germans and French, etc. If I want to use Swedish characters in identifiers you would have to define the whole upper half of the ASCII set. That would meet our needs.

(Buckley) What happens to keywords, do they get translated?

(Ellis) No, the Fortran character set must be included.

(Buckley) I will propose a resolution opposing this at the present time. It is premature and we may regret it.

(Ellis) It is too late, we have opened the Pandora's box with S8.112.

(Buckley) We can close it as an international body.

(Johnson) There have been some requirements, particularly from the Japanese.

(Ellis) This comes from a group set up by SC22.

(Mahabala) We do not need Fortran in Tamil or Hindi, but we always tell users to make their identifiers meaningful.

(Wagener) J3 was incredibly busy at Meeting 112 and was distracted so it did not spend a lot of time thinking about this. We were told then that we had to do something now. I hear a different story here.

(Schonfelder) What is the role of an ISO standard compared to national standards? These identifiers are appropriate for national standards not ISO standards. If you use an ISO standard the language should be portable across national boundaries.

(Pollicini) In Italy there is not a full terminology for Computer Science. In Italian the only problem is the stress. We use a mixture of English and Italian.

(Hirchert) One could view this a framework for supporting national characters with the Fortran character set as the international core. Taking it out would require a third public review.

(Schmitt) The requirement for German identifiers should not be mixed for languages that do not use the Latin alphabet. WG5 should tell SC22 that we cannot do anything until they have finished their work.

(Burch) The COBOL committee has been ahead of X3J3 in this area. They have done a lot of research, but we seem to have jumped ahead of them in one meeting. Clearly, we do not think that this is a bad idea, but we do not know how to do it properly at present.

(Cohen) Agreed.

(Buckley) Mahabala summed it up; it needs to be tackled and it is difficult. But now is not the time.

(Cohen) There are no existing compilers that do this.

(Paul) An important aspect of standards is portability but that is not the only issue. I do not know is the right time for this. We should look at the requirement and solve the problem.

(Tait) From a business point of view manufacturers will go for the markets which provide the greatest revenues, i.e., those that use the Latin alphabet.

(Mas) The keywords should be standard, but we need a solution for the identifiers. It is a real problem for the non-Latin alphabet users.

(Dahlstrand) Does not a register of repertoires exist?

(Ellis) No, it is a register of "coded" character sets rather than a register of characters themselves. For example, A-Z are characters, ASCII and EBCDIC are different codings for them.

(Dahlstrand) I don't agree. There are collating sequences.

(Hirchert) The problem is in reading the source in the first place. The user specified collating sequence must contain the default for A-Z.

(Tilbury) Character entities of different kinds cannot appear in the same operation rather than expression.

(Ellis) Right.

(Cohen) I think it is terrible that you cannot allow control characters in literals. Why do you need to allow a user specified collating sequence, why not just overload LLE, etc.? You can do this without going outside Fortran. Why cannot you compare strings of different kinds?

(Ellis) There is no intrinsic definition but you can define your own.

(Cohen) By allowing control characters in one source form and not the other you prevent the automatic translation from free to fixed.

(Schmitt) I am still worried about what is allowed in different source forms. Is A=ACHAR(10) allowed in free form?

(Ellis) Yes.

(Schmitt) The values you can put in a string should be the same as those you allow in a literal.

(Hirchert) There is only a restriction on what you can put between two quotes.

(Schmitt) But you still have two different kinds of characters; those which can be in literals and those which cannot.

(Hoffert) I know this was addressed. There are notes in the Minutes of Meeting 112 on this.

(Schonfelder) This is appalling. We have perpetrated a disaster by breaking our own rules. None of this was in the 112 pre-meeting. This should be removed from the standard.

(Burch) How do you really feel Lawrie? (to Schonfelder)

(Ellis) I accept that there are problems but if we want to withdraw it, we can stop the public review.

(Walter) Are there any other functional differences between free and fixed source form?

(Hirchert) Yes, the use of blanks.

(Walter) That is not a functional difference.

(Schonfelder) I propose a straw vote to the effect that WG5 demands that this be withdrawn from the standard. The source form should be returned to that of S8.111.

(Hirchert) Specifically identify what you want removed.

(Schonfelder) The identifiers in the standard should only contain the Fortran characters defined in S8.111.

(Warren) Time-frame?

(Schonfelder) Now.

(Ellis) It may be too late to do this with the X3J3 review.

(Hoffert) Urge X3J3 to carefully reword this feature rather than withdraw it.

(Schmitt) Divide discussion into what makes sense and what should be withdrawn. Most of us think this (S8.112) is bad and it is premature even if it is a good idea.

(Ellis) It is quite important to put this in perspective. I do not think that it is realistic to ask X3 to stop the public review. The public review might require its withdrawal or it may not. We should act accordingly.

(Walter) I want to support G. Schmitt. Let us base this on the technical rather than the political issues.

(Schmitt) I do not think that this is a good time to do this.

(Ellis) It violated the X3J3 rules but they decided to do it anyway. Like it or not we are stuck with it.

(Hoffert) There were many challenges to this at X3J3/112.

(Ellis) We either accept it or call off the public review in the US.

(Hoffert) I supported this at Meeting 112 because it provided minimal support for a coming requirement even if there were holes.

(Tait) X3J3 consistently breaks its own rules and I have no confidence in its ability to fix this problem. This is terrible.

(Schonfelder) WG5 should say that this standard is not ready for public review.

(Hirchert) Technically this may have been the wrong thing to do. Let us separate the technical and political issues.

Straw vote on Schonfelder's motion:
Yes You want the extra characters.
No You do not want them.
Motion failed 1-20-7.

(Burch) We should tell X3J3 to fix the problem as best as they can.

(Buckley) J3 made a major mistake at this time. What bothers me is the suggestion that the ISO standard to be reviewed would be different from S8.112. It is wrong to have the feature, but so be it.

(Pollicini) I almost agree with Schonfelder, but we cannot split it into two documents; ISO and US. Can we put a note in the international version drawing the reviewers' attention to the WG5 proposal that WG5 opposes this feature?

(Martin) We could do it.

(Schmitt) I agree with Pollicini it would help speed things up. It would speed things up if we alert SC22 to the problem and ask how it can be clone.

(Wagener) I do not know what the ISO method is. For the X3J3 vote all the NO votes go out with the document to be reviewed with a cover letter.

(Walter) Clarification please.

(Martin) When the document goes out in the US, other information goes out as well.

(Walter) Only the negatives and not the positives?

(Martin) Yes.

(Hirchert) This was a J3 reaction to material that was to be presented to SC22. We should tell SC22 that they have to provide the required support material. We may want to tell SC22 that the time-frame is not realistic.

(Muxworthy) Could we have a straw vote: The rules governing the characters that can appear in a literal are the same for both source forms?

(Hirchert) This is really a question of what FORTRAN 77 really meant. Do we want a restriction on what can go into a literal and do we want to ensure that control characters always mean the same thing?

(Burch) The straw vote says we reject what is in S8.112 but we cannot solve the problem.

(Tilbury) The control character issue is a red herring. The standard says that the literal can only contain what can be represented by the processor. There is no problem.

(Lahey) It is reasonable to write a program that translates between the two forms so the rules should be the same.

(Ellis) What it comes down to is what constitutes a representable character. Perhaps we should say it is a graphic character.

(Buckley) This discussion is trying to create a problem that does not exist.

Straw vote on Muxworthy's motion:
Yes the rules should be the same.
No The rules should not be the same.
Motion passed 26-0-3.

c. Modules, Interface Blocks, and Procedure Overloading (Wagener)

SCRIBE: K. HIRCHERT

J. Wagener presented a summary of the comments on these topics in the WG5 letter ballots on N357. This material is contained in N405.

Summary of Discussion on Specific Items:

Item 3: (Explain semantics of USE ... ONLY: without list)

(Warren) If the section notes are not officially part of the standard, why is an explanation in the section notes sufficient.

(Hirchert) The general description-in the main text covers this case. The section note explains the significance of that special case.

Items 8-10: (Problems in the description of overloading)

(Schonfelder) The "fix" for this problem in S8.112 is inadequate. Additional work is still needed.

Items 15 & 17: (Making all variable in modules have the SAVE attribute)

(Burch) Could this be done for COMMON too, or would that be incompatible with FORTRAN 77?

(Johnson) Such a change would be compatible with FORTRAN 77, but would remove the ability to put shared data at a position other than the root in an overlay.

(Hirchert) It would also interfere with producing multiple copies of shared data to facilitate multiprocessing.

Summary of General Discussion:

(Schonfelder) 1) The host association rules are familiar to users of Algol-like languages; the use association rules would probably be less error prone. Either would be acceptable. What is unacceptable is having both sets of rules.

2) The new overloading method has serious flaws: Internal procedures cannot be overloaded. The method for overloading module procedures is unnecessarily verbose. The fact that its interface is explicit is sufficient.

(Burch) The extra verbiage was put in for the benefit of the reader, not the writer of the processor.

(Hirchert) Originally, the idea of the new method was that all of the procedures overloaded under a given name or operator be tested in one place -a single interface block. It became clear that this was an unacceptable restriction, since, or example, one wishes to define operators for derived types in the modules where the types themselves are defined. We could have achieved what remains by simply adding a GENERIC( ) suffix similar to the OPERATOR and ASSIGNMENT suffices we already had.

(Schonfelder) The specific names offer no functionality to the user, it only helps the writer of the processor.

(Hirchert) It is of benefit to the user as a means of more clearly identifying procedures in debuggers or error messages.

(Johnson) It also reduces demands on the linker.

(Tilbury) Specific names are not needed in error messages, source file names and line numbers are more appropriate.

(Hirchert) True, but that does not work well for setting breakpoints in a debugger. Linkers will still have to deal with duplicate procedure names in different modules.

(Johnson) Yes, but they won't have to distinguish procedures on the basis of their argument attributes or obscure names constructed from those attributes.

(Walter) The management of specific names should not be imposed on the users of modules.

(Hirchert) I believe you can make a generic name public and all constituent specific names private.

d. Derived Data Types In Common, Equivalence

e. Pointers In Common (Hirchert)

SCRIBE: M. HOFFERT

Rationale:

Before deprecated features had been removed, there was an effort to keep old and new features distinct. Now deprecated features have been removed, there is a concern in X3J3 that the inter-section of old and new features

should be properly defined. People on X3J3 felt that they want to be able to use derived data types and pointers without having to use modules. Further, there is an agreement that this is useful for some users. There is a political issue involved that it helps with the acceptance of the new a little at a time by some opposed to the concepts of modules. It could be kept on the basis that it is part of the X3J3 compromise with different factions. Kurt feels that it does need major editorial changes.

Discussion:

(Schonfelder) Unsafe and provides no functionality within the rules. All these structures should not be allowed in COMMON.

(Hirchert) This provides a migration path.

(Brainerd) The argument of improving what were deprecated features is not a good one.

(Schonfelder, Tilbury) Very unhappy with this because it is non-portable, unsafe and has many dangling details.

(Brainerd) Felt old and new features should NOT be intermingled and there are many clumsy wordings as a result of this addition.

(Hirchert) There has been an attempt at patching what exists rather than dealing with the problems of COMMON directly. What is really needed is to redescribe the entire storage model.

(Buckley) This action is in conflict with P2. WG5 didn't ask for it. Is there a good reason for this?

(Hirchert) One issue is the maintenance of large codes and moving into 8X features all at once. The US committee wants this to get the two-thirds vote.

(Martin) This is political rather than technical. This makes it possible to make pointers global without modules.

(Adams) Removal of pointers or derived types from COMMON will NOT be allowed as an appropriate topic at the X3J3 meetings in Vienna. This is a re-visit and will not be discussed. Only the text can be corrected.

(Brainerd) Would like to see WG5 register a complaint against this.

(Buckley) This is a conflict with the P2 resolution and is NOT what WG5 had asked for. If X3J3 has a GOOD technical reason, then he could see it, but he sees NO new functionality and this should be done with modules.

(Hirchert) This placates people on X3J3, it has two-thirds support of the committee. It allows people to NOT have to use modules.

(Martin) Voting blocks on X3J3 change, pointers passed 25-12 and derived types in common passed 25-12. These are NOT the same people voting for the same principles. She urges the committee that a standard is needed quickly and therefore to accept this X3J3 position.

(Burch) There is a desire and need now to have old and new features to work harmoniously together so that as people move to F8X they do NOT need to do it all at once. This has technical advantages to people NOT wanting to add modules at first.

(Johnson) Storage association was supported strongly in public review. This may allow some current progress standard conforming.

(Hirchert) This makes COMMON with numeric and character data - people want this.

(Schmitt) Technical content is bad, the text is faulty, it will lead to very bad problems, but he could support it in order to help the US vote YES on the standard.

(Tait) Does not believe old and new can be mixed nor should storage association concepts be mixed. It can not be done.

(Lahey) Implementors will bring out F8X in stages. Allowing derived types and pointers in common will help this staged implementation.

(Schonfelder) This feature will make parsing more difficult.

(Adam) There are already structures in COMMON.

(Ellis) Does not accept a staged implementation to be a reason for anything in the standard.

(Schonfelder) Portability should be goal of the standard and this is very non-portable.

(ter Haar) The Netherlands deplores the work necessary to get this right and would vote against not having modules, wanted features to be deprecated, wants compatibility with FORTRAN 77, would support this in order to get US to support these other things.

(Meissner) Read Jerry Wagener's response to public comment on this issue.

(Buckley) Deprecated features were opposed in public comment because people did not understand what deprecation meant. X3J3 went a long way to help merge the international community and their portion and therefore he urges WG5 should vote for this on the grounds of compromise with X3J3.

(Paul) Comments that the public said that storage association was never going away. The US user community would not accept the removal of this concept.

(Hirchert) Qualified G. Paul's statement that after people begin using modules and see that they replace storage association, then the requirement for keeping storage association may wane, but not until people have a chance to see that they have another viable, better alternative.

(Mas) Storage association means efficiency.

(Schonfelder) This will not be true for long with multi-processor machines.

(Schmitt) Disagrees because there have been many changes to Fortran in the past 35 years and users will change more in the future as they have in the past.

(Mas) Storage association has been one of the secrets to Fortran efficiency. He therefore would regret to lose the possibility that more modem Fortran would prevent this efficiency or lose it in any case.

(Schonfelder) Regrets storage association's existence. It has many inefficiencies and will mean in the future it will be inefficient and with the new hardware and parallel processing it will no longer be necessary in fact it will be a definite problem.

(Hirchert) One can provide efficiency with the processors rather than with the user. The question is that perception of the user is that modules are NOT as efficient.

(Wagener) Voted NO in Palo Alto in January, and would vote NO again, but hopes not to have to vote again in the future. There is a large part of the FORTRAN community that wants modules and have used them, there are Fortran users who use common and there are a significant numbers in the Fortran community who do not want to use modules. Also we do NOT want to revisit this issue.

(Tait) Users do need to evaluate the language. WG5 could just remove the concept of derived types in common, but if it comes out there will need to be a third public review.

f) Allocatable Arrays and Pointers (Schonfelder)

SCRIBE: C. BURCH

(Walter) Why can't allocatable dummy arrays be allocated and deallocated?

(Schonfelder) AU such uses are intended to be pointers.

(Walter) Allocatable results on the left-hand side of assignments are needed to provide automatic conformance of the left-hand side to the right-hand side.

(Schonfelder) Pointers give the required functionality.

(Walter) Intrinsic functions don't return pointers, so they can't help with left-hand side conformance.

(Schonfelder) True. Assignment is a value-copying operation, pointer assignment only sets the pointers.

(Dahlstrand) Don't we need automatic deallocation on pointers?

(Schonfelder) No.

(Johnson) Allocatable arrays may be implemented by pointers, but the functionality is different.

(Hirchert) We would need garbage collection to get the automatic conformance Wolfgang wants.

(Walter) The compiler can't decide the size of the left-hand side at compile time for overloaded assignment operators. We need user-defined types other than structs.

(Schonfelder) Walt Brainerd has been saying so, too. Ada got that wrong, mixing representation with naming. Fortran has it right.

(Walter) The strings module I wrote shows that we need types that are just arrays.

g) Varying Character (Walter)

SCRIBE: J. L. SCHONFELDER

Draft Varying Character Module (N418)

A proposal for a module which implements varying character was presented.

(Apology: The Scribe did not manage to accurately note who said what during the discussion, so rather than wrongly attribute points, the notes are an attempt to record the technical content of the various discussions with a list of those contributing.)

Discussion on Assignment Overloading

Participants: K. Hirchert, L. Schonfelder, K. Burch, G. Schmitt, M. Cohen, B. Buckley

Two major problems in the proposed module approach were pointed out and discussed:

a. That default assignment for string to string assignment cannot be overridden or redefined under the current rules.

b. That the proposed definition had problems due to the way it performed deallocation. This would result in an assignment such as A = A for strings not working since A on the left would be deallocated before it could be copied from the A on the right. This problem could clearly be overcome by allocation of a temporary, doing a copy into this prior to any deallocation, reallocation of the left argument. The extra cost of this was raised. The problem of testing the association status of the left argument which might in fact be undefined on entry was raised.

It was suggested that in this case default string-string assignment which amounted to pointer assignment of the components (pointer to array of characters) was a valid semantics for such a dynamic string. The fact that this would result in two or more objects identifying the same physical space was objected to by a number of speakers.

The Need for Pointer Assignment to General Expression

Participants: G. Paul, K. Hirchert, C. Burch, J. Wagener, G. Warren, M. Cohen

The facility is required for convenience and also to allow for the situation where the size of the required result can only be determined by evaluation of the result.

It was pointed out that functions returning pointers can be used in a pointer assignment.

The question was raised as to whether an adequate module could be produced without such an extended facility and line answer was that in this case it could but it was somewhat inconvenient.

Further discussion distinguished two possibilities: firstly, the more general form where any general expression is allowed, and secondly, where any expression where the result is a pointer. The first required automatic implicit allocation of space for the result which was considered to be undesirable by a number of speakers.

The Need for Interface Blocks to Overload Module Procedures

Participants: C. Burch, A. Johnson, L. Schonfelder, J. Wagener, K. Hirchert

It was indicated that there were a number of problems with the use of interface blocks to specify generic names for module procedures. The inconvenience of having to write large numbers of interface blocks providing a single generic name for a single module procedure was shown, as was the difficulty with managing the specific names and their accessibility. Some discussion took place as to whether and/or how could the accessibility of generic procedures controlled, but the question was not resolved. The problem of some procedures not being includable in generic interfaces was mentioned; in particular, intrinsic procedures and internal procedures.

h) "Constant" and Minimum Width Field (Buckley)

Document: N413/N415

Two proposals were outlined. The first suggested that "constant" be allowed as a synonym for "parameter". The second defined a syntax which uses a minimum width on output.

(Tait) a. List directed would get around this.
b. This has implication on performance because formats must be processed at run time.

(Buckley) The compiler has to check it any way.

(Johnson) This is not true. You try, if it fails you put **.

(Buckley) The burden on Library writer may not be as much as that on the programmer.

19. FORTRAN 8X EFFICIENCY (WAGENER)

SCRIBE: A. JOHNSON

J. Wagener gave a summary of presentation given at a resent Fortran Forum (see at X3J3 Minutes Meeting 112), The conclusions are that F88 will be about as efficient as F77. There should be an improvement in reliability.

(Johnson) The comparison should be to how different tasks have to be done currently, i.e., allocation by indexing into blank common is probably very slowly. A comparison is not appropriate.

(Walter) Generics will be as efficient as before. Knowing more about the function will have a positive effect on efficiency with better optimization.

(Schonfelder) Efficiency will be improved, i.e., pointer assignment is more efficient than indexing, dope vector transfer is more efficient than indexing.

(Martin) There is also space efficiency.

(Lahey) Array operations we think will be more efficient. You are too conservative.

(Burch) In regard to copy in - copy out, do we pass non-contiguous to contiguous.

(Wagener) We allow this.

(Johnson) Vector valued produces a temporary.

(Hirchert) What about overlapping assignments. We've relaxed the rules, now copying is necessary.

(Wagener) That is Note 2.

(Paul) Move array valued functions left. Anything that would have been done elementally goes up tremendously in efficiency. The number of arguments passed will decrease. Compilers will pass argument much more efficiently.

(Wagener) I didn't do the whole language.

(Schonfelder) Structures/Pointers degrade reliability.

20. FORTRAN 8X BENCHMARKING (WILSON)

The results of running various 8X statements on a number of parallel computers were presented. This was part of a project carried out by A. Wilson and B. Smith.

The machines used were:

- Alliant
- DAP/510
- Connection

The execution speed of single 8X statements was examined.

a. For matrices, exp(A) and B*C executed in about the same time.
b. On a serial computer, if the execution time of the operation a*b is taken to be 1 then the time taken to compute lna+lnb is about 16. On parallel computer, the ratio of computation times for these two operation is about 2.

21. SUBSETTING

There was a long discussion concerning subsetting. The following straw votes were taken which summarised the views of WG5.

Straw vote on subsets:

1. Do you prefer separate standards?	) Yes-2; No-26; U-0
2. Would you accept separate standards?	) Yes-3; No-24; U-2
3. Would you accept F77 as an official subset of 8X?	) Yes-3; No-23; U-3)
4. Would you accept subsetting as a last resort?	) Yes-13; No-6; U-6)

22. FORTRAN -RELATED STANDARD EFFORTS (PCF, X3H5)

22.1 This is for information only. People will be kept informed of the progress.

22.2 Referencing National Standards in the Document (Schmitt)

- ANSI can be mentioned in the Document.
- There is one reference to ML Standard Chapter 13.. This should be deleted.

Section notes should be added to replace this reference

- Since the ASCII code is not recognized internationally, references to ASCII cannot be replaced by SI X3.4-1977.

23. FUTURE FORTRAN STANDARDS

A long discussion took place which concluded that the current process was inadequate for producing International Standards.

24. PROCESSING ISPRA RESOLUTIONS

A first draft of the resolutions was presented.

A draft of each proposed resolution was presented and discussed. Straw votes were taken to reach a consensus on the precise wording of each resolution.

The final form of the resolutions together with the results of the voting are given under Item 27 below.

25. OTHER TECHNICAL ITEMS

a. Semantics of the Data statement

(Walter) What is the interpretation of constants written in an initialization list? Shouldn't the semantics be the same as they are for the read statement so as to supply a constant with as many digits as possible?

(Schonfelder) This is not a good idea. This was not done correctly in F77, input/output is different from source code.

(Cohen) I support Lawrie. In F77 the processor was allowed to discard the extra precision. If we change, it will be a source of non-portability. There is no way out with leaving a portability hole.

(Walter) Numerically what I said makes sense.

(Brainerd) Is this is an editorial change?

(Walter) Computationalists will not agree. It is too bad the standard does not say anything about roundoff. Here you are preventing the vendor from doing better.

(Brainerd) No, the vendor can extend with precision.

(Walter) No, you have to add zeros. Assignment coercion is specified.

(Tilbury) If you want double specify it.

(Paul) The problem is when they don't put anything. But we are caught with an incompatibility no matter what we do. We have to stay with F77.

(Lahey) I agree with Julian.

(Schonfelder) It is necessary to have predictability.

(Paul) We're caught either way.

(Schonfelder) No, only with some interpretations.

(ter Haar) First, suppose I have a program which I want to be portable. Suppose I want to change easily from single to double precision. It can be done by implicit statement. Secondly, this rule is incomplete. It is not the only place where extra precision is allowed. VAX compilers do this.

(Hirchert) I have two comments. Firstly, this can be done by always specifying the higher precision. Secondly, where F77 specified an option we made a choice. You may not be doing the user a favour because this may not happen on some machines.

(Walter) This is not what was suggested.

(Hirchert) That may be getting you in problems elsewhere.

(Walter) As a numerical analyst this makes me mad, because there are well-known methods, i.e., IEEE of dealing with this.

(Tilbury) Type parameters solve Leo's problem.

(Brainerd) These issues are not addressed in the standard.

(Cohen) I think the definition in standard is correct. The Data statement should have the semantics of assignment.

(Schonfelder) The problem with what Wolfgang says is there are two ways to do assignment.

(Johnson) Part of this is to get uniform rules to deal with constant expressions.

(Warren) We have lost the underscore as a separator in numerical data; the KIND parameter precludes this.

(Martin) My solution was to allow insignificant blanks in numeric constants. This was rejected by X3J3.

(Hirchert) The one advantage of underscore is it can be extended to list directed I/O. This is a mistake and can be fixed as a small change.

(Lahey) What will the process be? This seems to raise old issues.

(Adam) It can be done after the public review by getting it to Gerhard and having him present it to X3J3.

(Schmitt) I can do it the way I handled the Austrian resolution. If anyone feels strongly about a proposal, send it to me. You have to bring me text and line numbers. I can take it to J3 and keep track of whether it is done.

(Warren) I don't have a proposal. I wanted to have WG5's opinion.

(Tilbury) We can still put blanks in constants even with the present use of underscore.

(ter Haar) I don't think we should have to present complete proposals. They should be WG5 comments.

(Schmitt) Yes, but if you want special action by me, I would like a resolution.

(Hirchert) Blanks don't extend to List directed I/O. We should ask X3J3 to do things so we don't cut off any options in using the underscore in the future.

Straw Vote:

Do we want to add this to the list of things we want resolved?
Yes-10; No-1; U-13.

It will be put on the list.

b) Kind Parameter In Front

(Brainerd) Does anyone have any thoughts on this irregularity?

(Rotthauser) The Japanese required this.

(Ellis) The claim is that one needs to know what is coming.

(Hirchert) It allows you to convert on the fly.

(Cohen) I agree. To implement this you need a very tight semantics analyzer, I don't believe it is necessary. It doesn't help significantly.

(Tilbury) I was baffled by this. I understand now. There are two implementation models. It is a ridiculous way to find out what is going. It is hardest way to do it.

(Schmitt) The subgroup decided there is no problem but to help implementation this model was proposed.

(Johnson) There are several reasons. The Chinese don't have a problem, they have only one character set. To deterministically lex in a single pass it is necessary.

(Tait) You can only avoid this by introducing escape sequences in character string. Japan made it clear they did want escape sequences in the strings.

(Ellis) I would agree with those that have implemented it.

(Hirchert) The Japanese don't want to deal with the escape sequences.

(Hoffert) It is necessary for efficiency. We don't have systems that support multi-character sets in source.

(Mahabala) We have one.

(Hoffert) The main reason is efficiency.

(Schonfelder) You have to know which type you are using. This is a non-problem. Maureen is correct, it is only for compiler efficiency.

(Ellis) Representation has nothing to do with this.

(Lahey) Efficiency of the compiler is not high on my list. It is difficult for us to anticipate future syntax Is it possible to encounter something which might close the string?

(Burch) Everyone agrees putting in front is safe and will work.

(Johnson) The source program is in coded form. The process must know either externally or in the source code itself. J11 also had this problem and came to the front.

(Schonfelder) Carl is correct. Is the syntax ambiguous? No, it isn't. Are we concerned with efficiency or regularity?

(Lahey) Regularity.

(Hirchert) I want to support regularity.

(Schmitt) We are spending much time on something on the C list.

(Warren) What do the Japanese have to say about this?

(Matsuo) In Japan there is only one default character set, so we can put it in front or behind. Some vendors put in front, others behind. I believe it should be in front.

(Burch) Character encoding varies. We have to make it work with many encodings.

Straw Vote:

The Kind type par should appear at end.

Yes-12; No-10; U-7.

c) Changes to Distribution by E-mail

There have been a number of changes to the way that e-mail is distributed. These changes should eliminate duplications.

d) Item 396 - Letter from Russia

Document N396

(Ellis) Respond asking them to submit a public comment.

(Dahlstrand) Welcome them to the process.

26. FUTURE MEETING

L. ter Haar has agreed to host the next meeting. The meeting dates will be August 13-17, 1990 at The Hague. There will be a Fortran Forum the following week after the X3J3 Meeting.

27. ADOPTION OF ISPRA RESOLUTIONS

		VOTE: Country Yes-No-Abst.	VOTE: Individual Yes-No-Abst.
I1	**Second DP1539** That WG5 recommends that the SC22 Secretariat adopt ANSI X3J3 adopt ANSI X3J3 document S8.112 as the second DP1539 for voting by the national member bodies of SC22.	10 - 0 - 0	30 - 0 - 0
I2	**Accompanying Document** That WG5 recommends to the SC22 Secretariat that a suitable change/rationale document, provided by the Convenor of WG5, be distributed with the second DP1539.	7 - 1 - 2	14 - 8 - 7
I3	**Closing Date of SC22 Ballot** That WG5 requests SC22 to schedule the ballot on the second DP1539 to close on January 19, 1990 in order to give the US member body sufficient time to process the input from its national review in order to achieve synchronization of the US and international Fortran standard.	10 - 0 - 0	29 - 0 - 0
I4	**Technical Content of Draft Proposed Fortran** That WG5, despite its preference for some changes in the technical content of the draft, strongly requests X3J3 that, in the interest of timely adoption of a new Fortran standard, no further changes be made with the exception of correcting errors and inconsistencies.	10 - 0 - 0	28 - 0 - 1
I5	**One Standard** That WG5 intends that the draft proposed Fortran standard become the sole international Fortran standard and that there be no subset.	9 - 0 - 1	25 - 3 - 2

VOTE:

		Country Yes-No-Abst.	Individual Yes-No-Abst.
I6	**Unrestricted Availability of Draft Proposed Fortran** That WG5 strongly urges SC22 and its member bodies that the draft proposed international Fortran standard be treated as a public document that may be copied, published, and distributed without restriction in order to ensure the widest possible exposure and comment.	**10 - 0 - 0**	**29 - 1 - 0**
I7	**Procedures and Milestones for the Revised Fortran Standard**	**10 - 0 - 0**	**30 - 0 - 0**

That WG5's primary concern is the timely release of a universally acceptable Fortran revision. Therefore WG5 establishes the following procedures and milestones.

July 13 1989	WG5 approves S8.112 for balloting within SC22 as second DP1539
(July 17-21 1989	X3J3 creates standing document S18 containing corrections and editorial changes to S8.112)
(July 27-Nov 24 1989	US public review of S8.112)
Sept 1989-Jan 19 1990	SC22 ballot on second DP1539
Oct 2 1989	WG5's proposed corrections and editorial improvements to the second DP1539 distributed by the Convenor to X3J3's four subgroups for incorporation into S18. WG5 heads of delegations are requested to separate their submissions into sections based on the areas of responsibility of the subgroups (*).
Nov 13-Dec 18 1989	WG5 informal letter ballot on S18 (Nov 24 1989 Conclusion of US public review)
(Jan 8-12 1990	X3J3 meeting to determine US position on the second DP1539)
(Jan 18 1990	US vote on SC22 ballot, accompanied by S18, forwarded to SC22)
Jan 19 1990	SC22 ballot concludes
Feb 1990	SC22 ballot results distributed to WG5 in order to obtain WG5's recommendations for further processing
August 13-17 1990	WG5 meeting in the Netherlands

(*) subgroups handle (a) sections 1-3,7,14, appendices A,B,C; (b) sections 4-6 and appendix C; (c) sections 8-10 and appendix C; (d) sections 11-13 and appendix C.

VOTE:

		Country Yes-No-Abst.	Individual Yes-No-Abst.
I8	**Development of Standards** That WG5 asks its convenor to advise SC22 that serious scheduling conflicts have occurred in the development of DP1539 simultaneously as an international and a national standard and asks SC22 to reconsider the mechanism for future language standard development.	**9 - 0 - 1**	**28 - 1 - 1**
I9	**Varying Character Module** That WG5 requests SC22 to subdivide Project JTC1.22.02 Fortran into JTC1.22.02.1 Revision of ISO1539 JTC1.22.02.2 Varying character module As a first draft for Project JTC1.22.02.2, WG5/N418 can be used.	**6 - 0 - 4**	**20 - 3 - 7**
I10	**Arbitrary Character Sets in identifiers** That WG5 notes that with the KIND parameterization mechanism, the second DP1539 supports arbitrary character sets for character data. It is desirable that the capability of using arbitrary character sets be extended at a suitable time to programmer-specified identifiers in Fortran programs. WG5 acknowledges the activities in SC2 and SC22 that are being initiated in this area, and asks that such work proceed as rapidly as possible. WG5 believes that it is important that international standards which will allow arbitrary character sets in programmer-specified identifiers be well defined prior to incorporation into programming languages in order to avoid incompatibility with other standards under development.	**8 - 0 - 2**	**26 - 0 - 3**
I11	**Removal of Arbitrary Character Sets in Identifiers** That WG5 believes that X3J3 erred in prematurely permitting the use of arbitrary character sets in identifiers. Therefore, WG5 strongly requests that X3J3 remove this facility in order to avoid incompatibility with other standards under development.	**7 - 1 - 2**	**21 - 6 - 2**
I12	**Character Literals** That WG5 believes that the difference in the rules governing character literals in fixed and free source form is an inconsistency that should be removed.	**7 - 0 - 3**	**23 - 1 - 6**
I13	**References to National Standards** That WG5 urges X3J3 to a) delete the unnecessary reference to MIL STD 1753 from the main body of the standard b) add a note to the standard, explaining the relationship between X3.4-1986 and ISO 646:1977.		**UNANIMOUS**

VOTE:

		Country Yes-No-Abst.	Individual Yes-No-Abst.
I14	**WG5 Representation at X3J3**		**UNANIMOUS**
	That WG5 commission Gerhard Schmitt, as a member of X3J3, to continue to attend (or to appoint an alternate to attend) as many meetings of X3J3 as possible, and to continue to represent WG5 opinion.		
I15	**WG5 Delegation at SC22 Meeting**		**UNANIMOUS**
	That WG5 commission Andy Johnson or Gerhard Schmitt as alternate to represent the WG5 Convenor at the SC22 meeting September 20-22, 1989.		
I16	**Appreciation of X3J3**		**UNANIMOUS**
	That WG5 thanks most warmly the chair, office-bearers and members of X3J3 for their work in developing DP1539 and records its appreciation of the vast amount of freely given time and expertise which has contributed to this project.		
I17	**Appreciation of Secretary**		**UNANIMOUS**
	That WG5 wishes to express its appreciation to John Wilson for serving as secretary at the 1988 meeting.		
I18	**Appreciation for Testing of Examples**		**UNANIMOUS**
	That WG5 expresses its appreciation to the members of the "Alvey Software Engineering Portable Package Framework/Fortran 8x Tools" Project for testing the sample programs and program fragments in the second DP1539 and for reporting the suggested changes in document WG5/N422.		
I19	**Appreciation for Electronic Mail Network**		**UNANIMOUS**
	That WG5 expresses its appreciation to Gerhard Schmitt and Kurt Hirchert for establishing and maintaining electronic mail distribution systems for WG5 and X3J3.		
I20	**Vote of Thanks for Support**		**UNANIMOUS**
	That WG5 thanks those companies which have generously contributed financial support to the success of the meeting, viz: Amdahl Italia ATEL CISI Italia Convex Italia IBM Italia		
I21	**Vote of Thanks**		**UNANIMOUS**
	That WG5 wishes to express its appreciation to the Convenor (Jeanne Martin), the host (Aurelio Pollicini), the Secretary (Fausto Milinazzo) and to JRC and its staff who have contributed to the success of the meeting, and to the JRC Cultural Committee for organizing the social events.		