DISCLAIMER

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X3J3 FAVORS RECURSION IN FUTURE FORTRAN STANDARD

X3J3, the Technical Committee for Fortran under ANSI (American National Standards Institute) voted at its October, 1980 meeting to develop a proposal for recursive procedures, to be included in the future Fortran standard now under development by the Committee. [The target date for completion of ANSI action on the future standard is 1985; based on experience with Fortran 77, the revised language can be expected to be in wide use after 1988.]

The proposal draft adopted in October provides that a Fortran procedure may call itself, either directly or indirectly, but only if its heading statement declares it to be a recursive subroutine or function.

Readers are again reminded that such X3J3 votes are in no way final. The Committee often extensively revises, or even withdraws, features after they have been "adopted" as candidates for future standardization.

Recursion Details Studied. The recursive procedure feature was further studied at the X3J3 meeting in January 1981. Some difficulties were identified, relating to the interpretation of such features as block COMMON, DATA, and SAVE appearing in recursive procedures. One participant pointed out that heretofore, the Fortran standard has avoided defining the precise semantics of these features. With recursion, however, it becomes necessary to face the semantic issues and provide a more complete specification in the standard.

For example, it must be decided whether items described in a DATA statement are to be initialized at each instantiation of a recursive procedure, or only once in a "global" fashion. A more philosophical statement of the same question is, whether each level of recursion creates a new set of Fortran statements, or whether all levels are simultaneously using the same set of Fortran statements. Can a recursive procedure include a variable that counts the number of times it has been entered at the current level?

FORTRAN PIONEER ANECDOTES WANTED

Pioneer Day activities at the National Computer Conference, to be held in New York in May 1982, will commemorate the 25th anniversary of the first Fortran compiler. A committee headed by Dr. J.A.N. Lee is collecting historical anecdotes relating to early Fortran usage. Of special interest is the history of Fortran in non-IBM environments, from the late 1950's through approximately 1967. A Fortran archive is being developed at the Charles Babbage Institute.

Please forward stories, anecdotes, and references to potentially interesting papers and persons (please use your imagination) to Dr. Lee at the following address: M43 / D22, IBM Corporation; 555 Bailey Ave; San Jose CA 95150.

NO -- YOU HAVEN'T MISSED AN ISSUE OF = F O R - W O R D = >

Volume 6 of For-Word Fortran Newsletter consisted of only 3 issues. If you received Volume 6, Number 3, dated September 1980, you have not missed an issue.

Loren P. Meissner
CSAM - 50B
Lawrence Berkeley Laboratory
University of California
Berkeley CA 94720

F I R S T C L A S S

Other X3J3 Actions

October, 1980 Meeting.

The Committee further refined the "Core and Modules" language architecture model that is to be used as the basis for development of the next Fortran standard. It was agreed that a Fortran "Application Area Support Module" should take the form of a collateral ANSI Standard, and that it would be expected that such a module would be developed by a Task Group of X3J3. Inasmuch as there is little precedent in ANSI for such a "family" of collateral standards, X3J3 intends to work closely with X3, SPARC, and other appropriate ANSI groups to ensure that correct procedures are followed.

The question of "name management" in a multi-module environment was addressed. As a first step toward resolution of this question, a "prefix" specification was adopted. This feature provides a way to specify a prefix that is to be attached to the beginning of keywords, procedure names, etc., if necessary to resolve ambiguity.

In view of X3J3's adoption of significant blanks, the question of blanks in a format specification arose. The Committee took the position that a format specification in a FORMAT statement is essentially a string of characters to be treated as data, rather than a sequence of syntactic entities subject to the rules for significant blanks. Thus blanks in a format specification are not significant.

In the Array Processing area, a number of intrinsic functions were adopted.

January, 1981 Meeting.

A key subject at this meeting was the "interface mechanisms" needed to permit interconnection of language modules. A "USING" statement, which provides for specification of a list of module names used, can be specified with each program unit. Along with each module name, a further list of specifiers can be given which includes a prefix, a set of associated files (program libraries, macro libraries, global definitions, etc.), and a set of environmental attributes. An extended CALL statement was adopted in principle, which will permit specification of default values for omitted arguments. A Macro facility was also adopted in principle.

Array features for compression and expansion ("pack" and "unpack") were adopted. Some other array features were refined, including a more precise description of the semantics of WHERE (conditional array assignment).

Core Content to be Studied.

At the last several meetings, X3J3 has been "adopting" language features while postponing decisions as to which features belong in "Core Fortran". Now that the broad outlines of the language are becoming clearer, a working group has been assigned to make recommendations, over the next several months, concerning Core language content. Meanwhile, increased emphasis will be given to several features for which detailed proposals have not yet been adopted, including Data Structures; Exception Handling; Groups and Internal Procedures; Entity-oriented Declarations; Enhanced Call; Alias; Name Management; Global Data; and Name-directed Input-Output.

Future Meetings of X3J3

16 to 20 Mar 1981, Austin TX
11 to 15 May 1981, Toronto
10 to 14 Aug 1981, Los Alamos NM
2 to 6 Nov 1981, Yorktown Hts NY

Meetings are open to the public, but facilities are limited. (Further information is available from the X3J3 Vice Chairman, Martin Greenfield, MS 844a, Honeywell Information Systems, 300 Concord Rd, Billerica MA 01821.)

International Fortran Meetings.

Some informal Fortran sessions will be held at the ISO/TC 97/SC 5 meeting in London, 5 to 9 October 1981. Also, a Fortran Forum is planned for 12 October in London, and another for 13 or 14 October in Edinburgh.

The next meeting of the Fortran Experts Group under ISO/TC 97/SC 5 will be held in Vienna during June 1982.

The Computing Environment for Mathematical Software

A conference on this subject will be held in Pasadena in late July 1981. See For-Word, Volume 6, Number 3.

CORRESPONDENCE

Peter P L Chan, Adelaide, Australia: "I applaud the proposal that future ANSI standards would make spaces significant in Fortran source code. Having had more than 10 years of experience in the use of Fortran, I have found only one major inconvenience with the language -- the limitation of variables and symbolic names to a small number of characters. I would like to take this opportunity to register a vote for removing this limitation, in order to make program logic more understandable and documentation easier."

James P Schwar, Easton PA: "At Lafayette College, we have a strong interest in Fortran 77 for our Computer Science and Engineering Programs. In my opinion, Fortran is still the language of science and engineering."

K W Loach, Plattsburgh NY: "I believe that it would be a very serious mistake to base a Fortran character set on the ASCII code. Firstly, the code has serious faults. Its character set is limited and its collating sequence is illogical. Secondly, it is not generally available. Many Fortran users have no choice but to use other codes.

"Fortran's great virtue has always been its comparitively high degree of portability. Accordingly, I believe that the best policy is to have the Fortran standard remain silent on the character code.

"An alternative would be to define and promulgate a Fortran character code. In this code, all currently used characters and transmission signals would be mapped onto a specified set of positive integers. The mapping would be defined by Fortran, not by any of the current codes, and would be machine independent. Any need to convert these codes to those used by particular hardware could be met by a simple machine-dependent integer-to-integer mapping."

ANNOUNCEMENTS

Fortran 77 Implementations

Honeywell Information Systems.

Level 6: "Advanced Fortran" is a full implementation of Fortran 77 which has been in distribution since early 1980. This implementation runs under GCOS6 Mod 400 and Mod 600. Extensions include a free source form, 31-character symbolic names, imbedded and trailing comments, multiple statements per line, INCLUDE, and conditional compilation. Additional data types are provided, along with additional intrinsic functions to support them.

CP-6: Honeywell Fortran 77 has been available on the CP-6 operating system since January 1980. Extensions include: INCLUDE statement; Double Complex data type; Data initialization in declarations; Multiple assignment; Compound statements; Hollerith, octal, and hexadecimal constants; and a Keyed input-output facility with keys of either integer or character type. An interactive symbolic debugging facility is also provided.

Level 66: Fortran 77 for the Honeywell Level 66 Series is scheduled for release during the first quarter of 1981. The language processor includes a Data Manipulation Language interface to I-D-S/II, a full symbolic debugging facility, interactive time sharing as well as batch mode, and compatibility with Fortran 66.

Computer Sciences Corporation.

Fortran 77 is now available on the INFONET network. The release FTN130 includes Fortran 77 plus extensions to accommodate existing practice and users, to interface with the CSTS file management system, and to provide general utility such as variable length character strings within fixed memory allocation.

University of Salford (England).

"We are currently implementing our Fortran 77 compiler on a PRIME computer and a number of 16 bit microprocessors. We would be very interested to receive feedback from anyone with an interest in using Fortran 77 on microprocessors in order to form a picture of user requirements for interrupt handling, input-output mapping, run time diagnostic facilities and so on".

David M Vallance
University of Salford
Salford M5 4WT, Lancashire, England

Other Software Products

IMSL Edition 8

The International Mathematical and Statistical Libraries Inc (IMSL) has recently released a new version of the IMSL Library. A new Library Contents Document, describing the Edition 8 release, is available from

IMSL
Sixth Floor, NBC Building
7500 Bellaire Blvd
Houston TX 77036

Debug Package for HP-1000

A source level Fortran debug package is now available for the Hewlett-Packard System 1000. Programs compiled for debug operation run normally, so that the debugger can be left in the program module for use in finding latent bugs. The price of "FBUG/1000" is $995. For further information, contact

Chuck Nickerson or Paul Miller
Corporate Computer Systems Inc
675 Line Rd
Aberdeen NJ 07747
(201) 583-4422

Fortran to Fortran Translator

This translator was originally developed for translating programs from IBM to CDC. A new table-driven version is now available which can be more easily adapted to translate between other Fortran dialects, including Fortran IV to Fortran 77. This translator is operated as a service, rather than as a licensed product: i.e., programs are sent to Milwaukee to be translated. An evaluation test will be made at a special rate, for up to ten 800-line programs, at $55 per program plus 20 cents each for excess lines.

Benchmark Dept.
DASD Corporation
9045 Deerwood Dr
Milwaukee WI 53223

REFERENCES

Fortran 77 for Humans by Rich Didday and Rex Page. (West Pub Co, St Paul MN, 1980)

This text is primarily aimed at beginners who want to acquire a solid understanding of program design and coding. A subset consisting of modern features of Fortran 77 is used for introducing programming concepts, while advanced features are covered in optional chapters. This organization also makes the text useful both in small and large computer environments.

Readers need no special background. Problems are distributed among applications in science, engineering, computer science, and business.

NBS Publications available from US Government Printing Office, Washington DC 20234.

"Validation, Verification, and Testing for the Individual Programmer", NBS Special Publication 500-56, stock number 003-003-157-8; $1.75 per copy.

"Using ANS Fortran", Gordon Lynn, Editor, with contributions by Frances E Holberton, J Larmouth, and M D McIlroy, NBS Handbook 131, stock number 003-003-02165-2; $4.25 per copy.

IFIP-80 Talk on Future of Fortran

"Fortran for the 1980's" was presented at IFIP-80 in Melbourne, Australia. Authors are Walter S Brainerd and Jeanne C Adams, both of whom are active in US and international Fortran standardization activities. The paper, which is published in the IFIP-80 proceedings, describes the Core and Modules language architecture proposed for the next Fortran standard, and discusses several of the proposed specific features in detail.

Programming Language Standardisation, edited by I D Hill and B L Meek. (Ellis Horwood, UK; John Wiley, US; 1980)

For anyone interested in how standards are written for Fortran and other programming languages, this book is on the "must read" list. The first chapter, "The Standardisation Scene," is a guide to the elaborate structure of committees at International and National levels that are involved in this process. The second chapter, "The Standardisation Process," gives an excellent feeling for the steps that a language definition must go through on its way to becoming an accepted standard. Each of the other chapters in Part 1 is written by a person who has been involved in developing standards for a particular programming language. Part 2 is a discussion of the issues in present and future standardization processes.

This excellent book is unfortunately very expensive ($44.50), because of its limited potential audience. But every technical library, if not each individual engaged in programming language research, should have a copy.

Information Bulletin for BASIC

Clarifications and Interpretations for the Minimal BASIC Programming Language Standard, ANSI X3.60-1978, are now available. Send $3.00 and a mailing label to:

X3 Secretariat, CBEMA
Dept BIB-1
1828 L St NW, Suite 1200
Washington DC 20036

CONCERNING FOR-WORD

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The editor's name and address appear in the Mailing area on the first page of each issue. Requests for additions or corrections to the mailing list should be directed to the editor.

Correspondence on all Fortran-related topics is welcomed. Especially solicited are reviews of recent Fortran textbooks, software products, literature, etc.