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**Recent Work** 

Title

=FOR-WORD=>. FORTRAN NEWSLETTER

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Volume 4, Number 3.

(Pages 9 - 12)

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#### Frank Engel Jr. Honored by British Computer Society

The British Computer Society announced in August that it has awarded Frank Engel Jr. an Honorary Membership in the Society. This award is in recognition of his contributions to computing, including his service for seven years as Chairman of the ANSI Fortran standards committee, X3J3, which culminated in his presentation of the draft proposed standard to X3 in June 1977. The award will be presented at the Annual Dinner of the British Computer Society, to be held in London on 29 November 1978.

For-Word concurs in congratulating Frank on the occasion of this award.

### Fortran Technical Committee under ACM-SIGPLAN to Meet at National ACM Conference in December

The Fortran Technical Committee under the Special Interest Group on Programming Languages (SIGPLAN) of the Association for Computing Machinery will sponsor a panel session at the ACM National Conference in Washington DC (4 - 6 Dec. 1978). This session, entitled "Whither Goeth Fortran?", will explore the future evolution of the language -- particularly with regard to such applications areas as graphics, process control, data base management, and array processing. The "modular" approach being explored by X3J3 will also be discussed.

The session is scheduled for 1:30 pm Wednesday, 6 December. Panel chairman will be Bruce Puerling (Bell Telephone Labs). Panelists will include Chester M. Smith Jr. (chairman of CODA-SYL Fortran Data Base Language Committee),

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Steven K Hue (Los Alamos Scientific Laboratory), Lloyd Campbell (Ballistics Research Laboratory), Dean Herington (Data General Corp.), and Richard Signor (chairman of International Purdue Workshop Fortran Committee).

The Fortran Technical Committee will also hold a combined technical and business session on Tuesday evening, December 5, beginning at 8 pm. The technical program will consist of a presentation on portability aspects of Fortran 77, by Betty Holberton (National Bureau of Standards). This will be followed by a discussion of the organization of the Technical Committee, future publication plans, dues and subscription rates, proposed By-Laws, and other topics related to the proposed transition from provisional status to full status as a chartered Technical Committee under SIGPLAN (in accordance with the newly adopted procedures of ACM).

Regular members of ACM can assist with the process of officially chartering the Fortran Technical Committee, by sending the following Petition to Bruce A. Martin Applied Mathematics Dept. Brookbayen National Lab

Brookhaven National Lab. Upton NY 11973

#### PETITION

As a Regular Member of the Association for Computing Machinery, I approve of the formation of a SIGPLAN Technical Committee on Fortran, and urge both the SIGPLAN Executive Committee and the ACM SIG Board to approve its charter.

ACM Membership No. \_\_\_\_\_ (Please include For-Word address label.)

FIRST CLASS

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Loren P. Meissner 50B 3239 Lawrence Berkeley Laboratory Berkeley CA 94720

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# For Reference

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#### X3J3 Adopts "Core Fortran" Proposal

The following proposal was adopted by X3J3 at its meeting in August 1978:

<u>Proposal</u>: The first draft version of "Core Fortran" will consist of Fortran 77 modified by making the following changes. It is designed to be a complete language providing all of the essential features of Fortran 77. It is intended to allow modules, designed either by X3J3 or by others, to be appended to the language in as natural a manner as possible.

The general philosophy governing this core design is that the core should be comprehensive, containing virtually all of the generally useful features of Fortran and that it should form a practical, general-purpose programming language. Modules would be used largely for special-purpose language features that entail high implementation costs or are used primarily in special purpose application areas. The number of such modules should remain small in order to minimize problems of program portability. Three examples might be (1) a module providing comprehensive array processing facilities, (2) one providing data base management facilities, and (3) one providing features of Fortran 77, and possibly certain other isolated special-purpose features, not contained in the core.

Another goal is to produce a more elegant language by moving redundant features and including features which lend themselves to modern programming practices.

The additions below are listed with corresponding Fortran 77 features to show that the core language will have at least the same functional capabilities as Fortran 77. They are intended as a general guideline for X3J3; they are not hard and fast rules.

<u>To be Added to Core</u> Fortran	To be Moved to Fortran 77 Module							
1. Free form source	<ol> <li>Column 6 for continua- tion and C for comment</li> </ol>							
2. Larger character set								
3. Longer names								
4. Simple data structures	2. EQUIVALENCE							
	3. COMMON and BLOCK DATA							
<ol> <li>Some array pro- cessing statements (e.g., subarray notation)</li> </ol>	<ol> <li>Passing an array ele- ment or substring to a dummy array</li> </ol>							

 Global data definition (Provides equivalent functionality but eliminates notions of storage association which have led to bad programming practices.)

 Control structures 5. Arithmetic IF (looping and case)
 Computed GO TO

7. Alternate RETURN

- 8. Internal procedures 8. ASSIGN and assigned GO TO
  - 9. Statement functions (if internal procedures have arguments)
- 9. A length for REAL 10. DOUBLE PRECISION (number of digits)

Redundancies: The following items already have

equivalent facilities in Fortran 77.

11. ERR= and END= specifiers (IOSTAT provides duplicate functionality)

12. H, X, and D edit descriptors (TRc and character constants in output lists provide same capabilities as H and X; double precision would no longer be in the c core)

 Specific names for intrinsics (generics suffice)

14. Association of ENTRY names (bad idea in the first place)

Enhancements: The additions below are intended to promote good programming practices or may be needed by proposed modules.

 Subprogram linkage (e.g., keyword parameters)

11. Bit data type

Also at the August meeting, X3J3 adopted a proposal (subject to further refinement) for internal subroutines and functions, with arguments.

#### <u>X3J3 to Study Variant Program Form for</u> On-line Terminals

At its meeting in August 1978, X3J3 discussed the need for a variant source program form to be used when entering Fortran programs at an online terminal. There was general agreement that a specification in this area is needed, on a shorter time scale than that anticipated for the next full revision of Fortran. A working group of X3J3 was assigned to prepare a technical report on this subject.

#### Closer Liaison With CODASYL Established

Work is continuing on the development of a Fortran data base language standard related to the CODASYL data base model. Recent meetings of the CODASYL Fortran Data Base Language Committee have been held in conjunction with X3J3 meetings. Beginning with the October meeting, an even stronger liaison was developed, with the establishment of a joint technical committee. This committee is a technical working group umder X3J3, and includes members from both X3J3 and the CODASYL FDBL Committee.

#### Concepts Relating to Fortran 77

(Continued from For-Word, Volume 4, Number 2, page 6.)

11. The comma between list items in a format specification may be omitted between a P edit descriptor and an immediately following list item that is an F, E, D, or G edit descriptor, even if the latter includes a repeat count. However, if the following list item is a format specification (i.e., is enclosed in parentheses), the comma must not be omitted even if the format specification consists entirely of an F, E, D; or G edit descriptor enclosed in parentheses.

#### Future Meetings of X3J3

Meetings are open to the public, but facilities are limited. Non-members wishing to attend should inquire of Martin Greenfield, MS844a, Honeywell Information Systems, 300 Concord Road, Billerica MA 01821 (phone 617-667-3111, ext 2912).

January 8 - 11, 1979, Austin TX

March 13 - 16, 1979, Baltimore MD

May 8 - 11, 1979, Boulder CO

July 31 - Aug 3, 1979, Santa Fe NM

Note that the locations (but not the dates) of the May and July meetings have been changed. Beginning in March 1979, X3J3 meetings will be scheduled Tuesday through Friday. Subcommittee meetings may be scheduled on Monday.

## X3J3 Meets With IFIP WG 2.5 and SIGNUM (whereabouts of R2D2 not known)

A portion of the October meeting of X3J3 was held in conjunction with a conference sponsored by ACM-SIGNUM (Special Interest Group for Numerical Mathematics) with the cooperation of Jet Propulsion Laboratory and Working Group 2.5 of the International Federation for Information Processing (IFIP). X3J3 members travelled to Pasadena, where they exchanged tutorials and participated in joint discussion of numerical methods as related to portability and standardization.

A focus of discussion was the need for specifying, within a program, parameters such as the number of bits of precision in a floating point number. The numerical mathematics groups are working toward an agreement upon the parameters that are needed and on how they might be used, and X3J3 is concerned with the process whereby they might be added to the Fortran language. Several techniques, including global constants, reserved names, "constant" generic functions (having a value that depends only upon argument type), and inquiry statements, were suggested. The typical user would probably not use these quantities directly, but would be strongly affected by their availability in a portable, efficient manner to the packaged software he uses. (The increasing use of software packages was noted.)

#### Topics Scheduled for Next X3J3 Meeting

Report on London meeting of Fortran "experts" under ISO (November 27 - 30, 1978)

Tutorial on Department of Energy proposals for Fortran extension

Report on Fortran features needed for data base manipulation

Tutorial on Fortran extensions for array processing

Proposal on Internal Procedures

Report on Procedure Interface (extended CALL)

Report on Data Structures

Proposal on length for REAL data

Proposal for Bit String data

Proposal on Source Form for On-line Terminals Proposal for NAMELIST

Report on multi-file files within Fortran 77

Report on Fortran 77 Concepts

Proposal to adopt text for Fortran 77 portion of Core Fortran (obtained by mark-up of X3.9-1978) as basis text, to which features replacing those "moved to Fortran 77 module" can be added.

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#### INFORMATION PLEASE

Will anyone who has a Fortran compiler written in Fortran, please contact Frank Engel at 179 Lewis Road, Belmont MA 02178. Frank is interested in compilers for Fortran 77 or Fortran IV, written in any dialect of Fortran.

Fortran 77 Compilers, Cont.

Three Fortran 77 (full language) compilers were announced in For-Word, Volume 4, Number 2.

Charles S. Bryant (MS 238, NASA Langley Research Center, Hampton VA 23665) announced in December 1977 a Fortran 77 compiler for the MODCOMP IV. In addition to full Fortran 77 language capability, this compiler features the following extensions:

Varying character data; multiple assignment; internal subprograms; namelist i/o; debug.

#### PUBLICATIONS

FORTRAN 77 PROGRAMMING, a new text by Walter S. Brainerd, Charles H. Goldberg, and Jonathan L. Gross, is now available. Publisher's suggested price for this 359 page "first text" is \$9.95. The text covers introduction to programming, loops, arrays, subprograms, and character data. An appendix describes the modifications needed for use with Watfiv-S. The book is published by Harper and Row, New York.

A review of Harry Katzan's FORTRAN 77 (mentioned in For-Word Volume 4 Number 2) is expected to appear in Computing Reviews, Nov. 1978. This book, published by Van Nostrand Reinhold (\$16.95) is a language description rather than a programming textbook. The book "succeeds rather well in describing the entire language using terminology close to that of the standard. However, the prose is much more conversational, making it easier to read and understand at any but the most detailed level." The reviewer found a substantial number of minor errors, especially in the input and output chapters. He recommends the book as an aid to learning about the new Fortran standard, but cautions that the book is not absolutely reliable for such purposes as settling "trivia" bets.

<u>Specifications for a Proposed Standard for</u> <u>Floating Point Arithmetic</u>, by J. T. Coonen, describes a proposal presented to an IEEE subcommittee whose goal is to standardize floating point arithmetic for mini- and micro- computers. This proposal was developed by the author along with Harold Stone and William Kahan. It specifies data formats and arithmetic operations down to the last bit, while being flexible enough to accommodate a variety of computer architectures. Great care is taken in the handling of exceptional conditions such as overflow and underflow. The report is designated as Memorandum No. UCB/ERL M78/72 (13 October 1978), Electronics Research Laboratory, College of Engineering, University of California, Berkeley CA 94720.

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#### Concerning For-Word

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Back issues beginning with Volume 2 are available upon request from the Editor, Loren P. Meissner. Volume 1 is available from National Technical Information Service, Springfield VA 22151, \$4.50 paper or \$3.00 microfiche. Ask for For-Word: Fortran Development Newsletter -PUB 91 -- Vol. 1, No. 1 (Feb 1975) through No. 6 (Feb. 1976).

Requests for additions or changes to the mailing list should be directed to the Editor.

<u>Contributions solicited</u>. Please send correspondence and reviews to the Editor.

As noted on Page 1, a Fortran Technical Committee under SIGPLAN is in process of formation. Plans are to develop a new publication for that group, presumably somewhat larger. Dues support should permit publication of longer items in that larger document. For-Word will continue to be published and distributed by Lawrence Berkeley Laboratory. The intent is to keep For-Word as a newsy (brief, timely) paper, and to develop the new publication on a more deliberate scale.

#### Copies of Fortran 77 Standard Still Available

The new ANSI standard, "Programming Language FORTRAN X3.9 - 1978" is available at the regular price of \$16.50. For 10 or more copies, or for other special cases, discounts are available: write to Bruno Bombardi at ANSI for information.

American National Standards Institute 1430 Broadway, New York, NY 10018