

[From **INITIAL STANDARDIZATION (1962-1966)**, below:]

The initial meeting of X3.4.3 was held at the BEMA Headquarters in New York City on August 14, 1962. ... At this August 1962 meeting, there was a consensus to undertake the standardization work. The scope and criteria of the effort were established.

X3.4.3 assumed the role of parent and policy maker and delegated all the chores below that to two working subcommittees. As such, X3.4.3 met only about twice a year. X3.4.3 originally had about two dozen regular members. All the major hardware vendors were represented. A number of user groups (SHARE, Honeywell Users Association, USE, VIM, IBM 1620 Users, CO-OP) participated. Some software houses (CSC [Computer Sciences Corporation], CUC [Computer Usage Corporation]) and universities (Wisconsin, Penn State, UCSD [University of California, San Diego]) had members.

The parent X3.4.3 did thrash out some very controversial issues.

[Library of Association for Computing Machinery](#)

From Proceedings, AFIPS National Computer Conference  
Houston, June 1982 (Pages 817-824)

**History of Fortran Standardization**

(excerpt)

*Martin N. Greenfield*

[...]

Fortran standardization dates back to early 1960. The language had just been selected by industry over ALGOL as the language for scientific and engineering work. The major vendors recognized the requirement to provide Fortran compilers in order to compete with IBM. The general strategy was to provide a compiler with the functionality of the 704/709 Fortran and to add features as a competitive inducement. The impact of these added features was two-edged. Although they contributed to the development of the language, they threatened to splinter it into a myriad

of uncontrolled dialects. Adding to the problem, a rigorous definition of the language did not exist, even within IBM.

Fortunately, at that time ASA [American Standards Association] (subsequently to become ANSI [American National Standards Institute]) and BEMA [Business Equipment Manufacturers' Association] (subsequently, CBEMA [Computer and Business Equipment Manufacturers' Association]) undertook sponsorship of a massive standardization effort covering a broad variety of data processing areas. Someone had the brave idea of including languages. The ASA X3.4 committee conducted a survey of existing programming languages. Fortran, COBOL, and ALGOL were selected as the candidates for standardization. X3.4 at their May 1962 meeting established the X3.4.3 committee and directed it to standardize the Fortran language.

### **INITIAL STANDARDIZATION (1962-1966)**

Bill Heising, of IBM, was appointed as the initial chairman of X3.4.3. Bill sent invitations to potentially interested groups to attend a formation meeting. Accompanying the invitations was a document written by Bill together with Dick Ridgeway that was proposed as the starting draft for the standardization effort. This Heising-Ridgeway Fortran was based upon the forthcoming [IBM] Fortran IV.

The initial meeting of X3.4.3 was held at the BEMA Headquarters in New York City on August 14, 1962. This makes 1982 both the twenty-fifth anniversary of Fortran [see Annals of the History of Computing, Vol 6 No 1, January 1984: Special Issue – Fortran's Twenty-Fifth Anniversary: Pioneer Day, Houston, 9 Jun 1982] and the twentieth anniversary of the start of its standardization. At this August 1962 meeting, there was a consensus to undertake the standardization work. The scope and criteria of the effort were established.

X3.4.3 assumed the role of parent and policy maker and delegated all the chores below that to two working subcommittees. As such, X3.4.3 met only about twice a year. X3.4.3 originally had about two dozen regular members. All the major hardware vendors were represented. A number of user groups (SHARE, Honeywell Users Association, USE, VIM, IBM

1620 Users, CO-OP) participated. Some software houses (CSC [Computer Sciences Corporation], CUC [Computer Usage Corporation]) and universities (Wisconsin, Penn State, UCSD [University of California, San Diego]) had members.

The parent X3.4.3 did thrash out some very controversial issues. One of recall concerned a proposal from those working with the then new character-addressable hardware. They could save much space by not allocating the same space to integer and logical data as was allocated to reals. In fact, they preferred not to have any fixed storage relationship between the data types. Logicals could be packed into one byte or less. Double precisions could occupy just two or three more bytes than reals. Their arguments centered about the concept that a language standard should not be as hardware biased as the word-storage-unit relationship implies. After some impassioned discussions the heavy dependence of Fortran on storage association for efficiency and the dominance of word addressable processors won.

Most of the actual standardization work was handled by the two subcommittees. X3.4.3-IV was responsible for the standardization of the language based on Fortran IV, while X3.4.3-II was to do the same for Fortran II.

The subcommittees were small compared to the size of groups currently developing draft standards. It was fortunate, because it provided an efficient working arrangement and uninterrupted participation. Little time was lost in having to bring new members up to date. The regular members of X3.4.3-IV were

- Martin N. Greenfield, Honeywell, chairman
- Richard K. Ridgeway, IBM, editor
- Caral Sampson (Giammo), Philco, secretary
- Tom Martin, SHARE and Westinghouse
- Geraldine Zimmerman (Bowen), UNIVAC
- Lou Gatt, CSC
- Ken Tiede, CDC
- Carl Bailey, CO-OP and Sandia
- Bob Mitchell, CO-OP and UCSD

Along with the X3.4.3 chairmanship responsibilities, Bill Heising was a very active participant in the effort of the X3.4.3-IV subcommittee. Others from X3.4.3 participated from time to time, but the bulk of the effort was done by the group above.

The work proceeded during the following two years. Although some meetings were hosted at the sites of the different members throughout the country, the bulk of the sessions were either at BEMA headquarters or at the IBM program development center in the Time-Life building, both in New York City.

The initial Fortran IV compilers were all under development while the work of X3.4.3-IV was in progress. The members of X3.4.3-IV were all either responsible or could direct changes in their language specifications for these implementations. It was a unique situation, where language changes adopted by the subcommittee were incorporated into the compilers almost immediately. I have always felt that the actual standardization of Fortran stemmed from the discussions, understandings, and agreements of X3.4.3-IV rather than from formal text that followed some years later.

The undocumented agreement within X3.4.3-IV was that the standard would not incorporate any feature that was not planned for all the implementations. Since the starting point for all of our language specs was the IBM-proposed language, it followed that the draft most closely represented the IBM implementation. It was by no means a slavish [unquestioning] copy. For one thing, there were no rigorous specifications within IBM of much of Fortran IV that could have been copied. This was particularly true in the input-output area. There were some features that IBM meant to carry into Fortran IV from their Fortran II implementations in order to protect their users' investment.

Unfortunately, some of their Fortran II implementations contained some objectionable shortcuts. For example, a constant could precede a variable and imply a multiplication operator (5L meant  $5 * L$ ). To their credit, there was never much of a hassle with those from IBM in deleting features that were objectionable carryovers from existing implementations of Fortran II. I believe they were sincerely motivated in

working toward the best long-term interests of the language. Another change of note was that the DATA statement syntax was altered from the way IBM was implementing it. It was originally specified with parentheses rather than slashes as the delimiter for the list of constants.

Having no precedents, X3.4.3-IV had to address numerous problems common to all language standardization. Much of this we take for granted now, but there was nothing to turn to at the time. There were discussions as to whether there should be a standard. There is a penalty: The presence of a standard implies the pressure of conformance over a long period to a static document. This could certainly serve to limit the growth and development of the language. Even if motivated, the implementor, constrained to conform, would be prohibited from adding extensions. Programs requiring nonstandard functionality could not be developed. Unanticipated requirements could not be satisfied until after the many years needed for a new revision had elapsed. The difficulties of specification of a standard could artificially limit the functionality because it might be too difficult or unwieldy to word the true restrictions. Once a feature was standardized, its life would be semi-eternal even if the feature were a mistake. The result is that generally a very conservative posture is assumed in deciding what is to be included. The potentially useful but untested functionality usually doesn't make it. These are all penalties to be weighed against the advantages of portability and communication that standardization could provide.

A partial answer to these objections to having a standard was worked into the interpretation section of the standard and has been carried into all the subsequent revisions of Fortran standards. The standard is to be interpreted as permissive. That is, that the standard serves only to specify a part, not all, of the language. Anything not specified isn't unclean, bad, immoral, or even not kosher. It is simply not specified. Similarly, things that are prohibited are things that are simply uninterpreted when violated. A standard program must be limited to what is specified in order to conform, but the same is not true for a processor. A processor may provide array processing, but it must handle standard subscripting in the conforming manner. Thus, an experimental extension can be available in

a standard processor. The processor must be able to properly interpret standard programs, but may also provide interpretation to a nonconforming program. The choice is then available to conform or not as the economics dictate. Some nonconformance is encouraged.

The subcommittee decided that the target audience for the standard would be compiler implementors or those on users' staffs who were the Fortran support experts. It was felt that this latter group were competent in being able to implement a compiler; so, in effect, there was just the implementor that characterized the audience. It was felt that the standard should specify the requirements for a standard conforming program rather than a compiler, but I don't believe this was apparent in the document.

The decision was made to use English rather than some metalanguage. This was in the belief that the description of the semantics was the difficult problem. Use of a metalanguage would not help there. A metalanguage was at best only assisting in tackling the easiest part of the description. It was felt that its precision did not compensate for the need to become familiar with the added formality. Interestingly, the one most useful area that could have been served by a precise description using a metalanguage is the FORMAT statement. There was actually an error in the way it was specified in the standard. I am still unaware of a complete and precise description of that statement using some metalanguage.

There were many challenges to our ability to describe. CDC had proposed that the new logical IF be a two-way branch analogous to the arithmetic IF. This would have saved us much descriptive grief in handling the concept of a compound statement that had in this one place crept into the language. For example, we could no longer accurately state that every statement could have a label. It also led to an unduly harsh restriction prohibiting some forms of the logical IF from being the terminal statement of a DO loop.

The greatest challenge to our descriptive capabilities was presented by the extended range of a DO loop. (There are some who would claim that this honor should go to the concept of second-level definition.) All the implementations of Fortran IV being developed allowed a more liberal extended range than the one appearing in the standard. The committee

would have been amenable to a less restrictive extended range if it could only have been appropriately described. Everyone tried at least twice. Any definition that included statements about the sanctity of the contents of index registers, although reflecting the real concern, was inappropriate. The definition finally adopted was an accurate subset of what everyone was providing. The definition was felt to be reasonably understandable. Those of you who have struggled with that definition and its prerequisite concept of *completely nested nest* might quibble about the description being reasonably understandable. This is only because you did not struggle with some of the descriptions that were rejected. This was certainly an instance where the ability to describe limited the technical content. I believe that there is some of this effect in most standards. It is deluding not to admit it.

There were a surprisingly small number of new terms that had to be coined. Terminology common to several manuals was preferred, since it would already be familiar. The (usually missing) rigorous definitions of these terms had to be developed. Among the newly coined terms were: *definition* and *undefinition* and their related states of being *defined* or *undefined*; *reference* as applied to data and to procedures; and *intrinsic function*.

The term “intrinsic function” had its birth at a bull session during one of our meetings. We had been discussing the classification of functions, using the then customary terms *open* and *closed* functions. *Open* functions meant in-line code; *closed* meant some internal procedure. There was the concern that the absolute function *ABS*, generally thought of as the obvious prototype of in-line code, was no longer such when the argument was of complex data type. Further, the tightening techniques being developed for some codes might make it attractive to put more formerly closed functions in line, for greater speed. Besides, the terminology smacked of a particular implementation consideration. Lou Gatt piped up with the idea that the basic characteristic of these functions was that they were cast into or intrinsic to the processor, and that therefore we should call them *intrinsic functions*. So credit for this term belongs to Lou.

We were later to find that a subtle side benefit of our standards work was the widespread use of the terminology used in the standard. Our terminology was generally accepted and replaced the proliferation of some terms for certain actions and objects that were in use before without any rigorous and agreed-upon definitions.

The subcommittee gave some consideration to how to enforce the standard through use of acceptance procedures. Two hurdles caused us to turn away from further work in this area.

We realized that an exhaustive verification was not possible. It might be misleading to develop some partial verification package that might be construed as being total. Any such official package might be misused as a standard performance benchmark. The second hurdle was simply not having the manpower to do the work. It was hoped that market pressures would lead to some accepted verification means, but we didn't have the resources.

The subcommittee X3.4.3-II drafting the specification based on Fortran II was even smaller than that of X3.4.3-IV. Their membership, as I recall, was

Jack Palmer, IBM, chairman

Irwin Boris, Honeywell

Charles Davidson, University of Wisconsin, 1620 Users Group

Don Laird, Penn State University

Bob Bruneile, Honeywell Users and NIH

Bernice Weizenhoffer, IBM

Robert Hux, RCA

Partly because their target was better defined, X3.4.3-II completed their work and the first draft Fortran standard almost a year before X3.4.3-IV finished. They were directed by X3.4.3 to keep the draft on hold until X3.4.3-IV had its draft ready. There was still the hope at that time that a compatible standard representing Fortran II and Fortran IV could be produced.

Subsequently, X3.4.3 decided that there should be a standard for the full language and a standard that was a proper subset of the full language.

It was not possible to use the X3.4.3-II draft as the subset because of the number of totally incompatible differences between Fortran II and Fortran IV. The result was that the work of the X3.4.3-II was discarded. The subset was created by deleting text from the X3.4.3-IV draft. I hope that the draft produced by X3.4.3-II finds its way into the archives of Fortran history. Through no fault of its own, the effort of X3.4.3-II was not incorporated. Their work is historically significant in that it was the first completed draft of any language standard.

In October 1964, the two proposed draft standards were published in the Communications of the ACM. These were the first standards ever proposed for a programming language. They severely taxed the editing and approval mechanisms of ASA and BEMA. Draft standards up to then rarely needed more than a page of text and that page usually had room for the diagrams of the screw thread. The inability to rigorously check for conformance was shattering. It is little wonder that it took almost a year and a half before final approval was obtained in April 1966. The full language standard was designated ASA X3.9-1966 Fortran and the subset, ASA Basic Fortran.

Early in the standardization effort, the European Computer Manufacturers Association (ECMA) submitted a proposed draft of what they felt the full language should contain. Since they were separated from the developments in this country, their proposal fell between the Basic Fortran and the full Fortran. X3.4.3 voted to standardize on only two levels. When Fortran standardization was considered by the International Standards Organization, the ANSI form and content was chosen as the basis. The ECMA subset in ANSI form was added as the intermediate of three levels.

### **INTERPRETATIONS PERIOD (1967-1970)**

Late in 1967, the then disbanded X3.4.3 was recalled primarily through the urging of the National Bureau of Standards. NBS, and in particular, Betty Holberton, was attempting to produce a Federal standard for Fortran. Betty's examination of the X3.9-1966 Fortran standard led her to submit a few dozen questions on interpretation. Other clarification

inquiries were received from other sources. The Fortran group was revived as the only body that could authoritatively provide the clarifications. This process turned out to be more tedious and demanding than the standardization effort itself. Because we were dealing with an approved standard, not a single comma could be altered without going through the same long approval cycle. Interpretations had to be based on a rationale developed from the standard's actual wording and not from what even the original authors felt it should have been. Two interpretation reports were published, but they took over three years of meetings to produce. The difficulty of that interpretation effort has had its impact on the form of the standard for Fortran 77. Those who participated in both efforts took pains to carefully examine every phrase to reduce to a minimum the chance of misinterpretation.

By 1968 enough extensions had appeared in the more current implementations, to have the Fortran group appoint someone to study whether these extensions should be standardized. Frank Engel was selected as the one to conduct this study. Following Frank's report, in January 1969, the committee voted not to reaffirm X3.9-1966 when its review period came up, but to provide a new draft standard.

The committee had a succession of chairmen during this period. Bill Heising was replaced by Dick Ridgeway. Heising later returned as chairman prior to having Dennis Hamilton assume the position. In September 1970 Frank Engle assumed the chair ....



RECEIVED

DEC 2 1968

F. ENGEL, JR.

Minutes of the Eighth Meeting of  
USASI Working Group X3.4.3 - FORTRAN  
February 2, 1968  
Shell Oil Company  
RCA Building  
50 West 50th Street  
New York, New York 10020

1968

Doc. #X3.4.3/2

Contents of Minutes

1. Opening Remarks
2. Procedural Items
3. Chairman's Report
4. X3.4.3B Report
5. Approval of X3.4.3B Documents
6. Disposition of X3.4.3 Approved Items and Interpretations
7. Mechanism For Extension to FORTRAN
8. Items Discussed But No Action Taken
9. Next Meeting
10. Adjournment

Appendices

- A. X3.4.3 Mailing List
- B. Attendance
- C. Agenda
- D. Membership Rules for X3.4.3
- E. X3.4.3B Transmittal to X3.4.3
- F. Procedure for X3.4.3 Approval of X3.4.3B Output
- G. X3.4.3 Approved Interpretations

1. Opening Remarks

The eighth meeting of USASI X3.4.3 was called to order at 10:00 am on February 2, 1968, by the Chairman, William P. Heising.

Richard Ridgway resigned as chairman of X3.4.3 in August, 1967. Mr. Steel, chairman of X3.4, appointed Mr. Heising chairman of X3.4.3.

The principal purpose of the meeting was to act on the report of X3.4.3B. A report of their work by X3.4.3B was distributed separately in advance of the meeting.

The chairman has appointed an advisory committee. The members are:

Martin Greenfield  
Dennis Hamilton  
John Neuhaus  
Caral Sampson

The Chairman also appointed Martin Greenfield as membership chairman. All applications for membership should be submitted to Mr. Greenfield, who will review the applications and pass them on to the Committee. The membership chairman will also be responsible for keeping the membership of the Committee in balance.

2. Procedural Items

2.1 Attendance

See Appendix B.

2.2 Agenda

The agenda shown in Appendix C was approved without dissent.

2.3 Previous Minutes

The previous meeting was held on February 23, 1967. There was some discussion as to whether the minutes, particularly the following passage in Opening Remarks, accurately reflects the meeting.

"By a vote of 15-0-0, it was decided that actions of the committee would be by consensus, that any official act would be reflected in the minutes of a meeting, and that any matter could be brought before the committee by any member."

The main problem is the definition of "consensus" and when consensus must exist. Heising recollected that the "Opening Remarks" refers to substantive (technical) matters and not procedural matters. Furthermore, PR 27 specifies that approved output from interpretation committees must be without dissent. Any dissent on substantive matters must be documented.

Interpreting "Opening Remarks" in the preceding manner, the minutes of February 23, 1967, were approved.

#### 2.4 Membership

1. "Membership Rules for X3.4.3" proposed by Mr. Greenfield, as amended by the Committee and shown in Appendix D, were approved without dissent. Application for membership should be in the form of a resume and should be directed to the membership chairman.

2. Without dissent, the following were approved for voter membership:

Lt. David Kennamer	US Army
Ward Klein	IBM
Dennis Hamilton	Univac
A. Richard Jones	Shell Oil Co.
Kenneth Shostack	Raytheon

#### 2.5 Mailing List

The mailing list for X3.4.3 will consist of both voter and observer members. By a vote of 14-0-0 it was agreed that if members of subcommittees of X3.4.3 are not voter members of X3.4.3, they will automatically become observer members.

### 3. Chairman's Report

#### 3.1 Appointments

The Chairman has appointed an advisory committee and a membership chairman. See section 1, "Opening Remarks". He also appointed Carol Sampson secretary.

### 3.2 ISO TC97/SC5

The Chairman attended a meeting on November 5, 1967, of ISO TC97/SC5. This was the first TC97/SC5 meeting in two years. It was convened for two major reasons: to review the COBOL standard and to initiate work on Numerical Control Languages.

R. Bemer of General Electric was elected chairman of TC97/SC5. TC97 is equivalent to X3, and SC5 is equivalent to X3.4.

At the SC5 meeting October, 1965, in Copenhagen, both the FORTRAN and ALGOL drafts were approved for the accelerated schedule of approval. One month later in Tokyo, TC97 accepted the recommendation. The documents then had to be translated into French. Since that time, there have been many problems in getting the material typed and obtaining reproducible copies of some of the documents. However, the problems have been cleared up. Mr. Heising has proof-read the English version of the FORTRAN document.

To become an international standard, 100% of the member nations must approve the standard. At this time there is no international standard. If 60% of the member nations approve a standard, then that standard becomes an official recommendation.

As to COBOL, TC97/SC5 adopted a proposed COBOL standard (basically the U. S. document with many changes) and appointed an editing committee. The random processing module was not included.

### 3.3 X3 Secretary

Nat Stone was appointed acting secretary of X3 and acting director of standards for the data processing group of BEMA.

## 4. X3.4.3B Report

Dennis Hamilton, chairman of X3.4.3B, gave a verbal report on the work of X3.4.3B. A summary follows:

X3.4.3B was formed as a result of the minute on page 2, item 7 of Doc #X3.4.3/1. They have met six times since February, 1967. A scope of work was defined and approved by X3.4.3B and the chairman of X3.4.3. The former chairman of X3.4.3, Mr. Ridgway, clarified the definition of "consensus" at the request of the Committee.

Copies of all documents approved by X3.4.3B for transmittal to X3.4.3 were distributed to X3.4.3 prior to this meeting (see Appendix E). Further, X3.4.3B is interpreting the standard X3.9-1966 with the changes indicated by Appendix F and Appendix G of X3.4.3B/2. Interpretations

reference the document using the line number scheme developed by X3.4.3B.

The chairman was directed to submit the following motion to X3.4.3:

"Resolved: The provisions set forth in 'Proposed Procedure For X3.4.3 Approval of X3.4.3B Output' as appearing in Appendix H of X3.4.3B/5 are approved."

The Chairman was directed to transmit to X3.4.3 those items approved by X3.4.3B through November 11, 1967. It was Mr. Hamilton's opinion, as well as the opinion of the members of X3.4.3B in attendance, that X3.4.3B wished to have X3.4.3 approve these items and send them to X3.4 and X3 for their approval. The actions taken on these documents are shown in Section 5.

The next three meetings of X3.4.3B will be:

April 4 and 5	Honeywell	Boston, Mass.
June 6 and 7	RCA	Cherry Hill, N. J.
mid-September	Sandia	Albuquerque, N. M.

The Chairman of X3.4.3 commended the chairman and members of X3.4.3B for their fine work.

## 5. Approval of X3.4.3B Documents (Appendix E and Appendix G)

### 5.1 Statement on Rounding (page E-2)

The USASI document referred to in the statement on rounding is Z25.1-940 Reaffirmed 1961.

The X3.4.3B statement on rounding, modified to include the document reference, was approved (15-0-0). The complete approved statement is as follows:

In the X3.9-1966 and X3.10-1966 documents, the word "rounding", or some form thereof, is used. Note that the USA standard on rounding, ASA Z25.1-1940 Reaffirmed 1961, is not applicable to X3.9-1966 and X3.10-1966. Note further that a rounding procedure is not specified in X3.9-1966 or X3.10-1966.

### 5.2 Blank Lines In X3.9-1966 (page E 8)

There is a misalignment of line numbers and lines of text in the standard X3.9-1966. It therefore seemed desirable to have a uniform way of referring to lines within the standard. It was

decided to identify those line numbers with no associated text as blank lines and to insert line numbers where needed.

The X3.4.3B line numbering scheme was approved (15-0-0).

5.3 Appendices F and G, X3.4.3B/2, Typographical and Transcription Errors and Other Mechanical Flaws (page E 3)

The published standard is not the same in content as the document voted on by X3. All items in the two subject categories reflect the differences in these two documents.

The appendices were approved (15-0-0).

5.4 Actual Interpretations (page E 14)

The interpretations submitted by X3.4.3B numbered:

USAS X3.9-1966/#2  
USAS X3.9-1966/#3  
USAS X3.9-1966/#5  
USAS X3.9-1966/#8  
USAS X3.9-1966/#36

were approved (15-0-0).

5.5 Procedure for X3.4.3 Approval of X3.4.3B Output (page E 10)

The motion submitted by Mr. Hamilton was defeated (0-14-0).

Resolved: The provisions set forth in "Proposed Procedure For X3.4.3 Approval of X3.4.3B Output" as appearing in Appendix H of X3.4.3B/5 are approved.

Minor modifications were made to item 5, paragraph 2 and the following motion was approved (14-0-0):

Resolved: The provisions set forth in "Proposed Procedure For X3.4.3 Approval of X3.4.3B Output" as appearing in Appendix H of X3.4.3B/5 and as amended at this meeting are approved.

The approved document is attached as Appendix F.

## 6. Disposition of X3.4.3 Approved Items and Interpretations

Heising reported on a discussion he had had with Goodstat regarding publication of approved interpretations. The Communications of the ACM are a better vehicle for publication than the SIGPLAN notices because the CACM has the wider distribution. The Committee decided to try for publication of the approved interpretations in the CACM.

Heising pointed out that the approved interpretations contain references to X3.4.3B minutes and working documents. Since the documents of X3 and its workings groups are not in the public domain, modifications should be made to the approved interpretations before publication. Because it is USASI policy that minutes are not public documents, X3.4.3 would have to get X3 approval to make the minutes available to the general public. It was decided to remove the references to X3.4.3B documents from the interpretations and write an appropriate introduction to put the work in context.

There then appeared to be a timing problem with the writing of the introduction. The next X3.4 meeting is in early March and the next X3 meeting is in April. Heising suggested that the Committee give the Chairman the authority to ask X3.4 and X3 for publication approval - without knowing what the final form of the documents would be.

### 6.1 Resolution to Seek X3.4 and X3 Approval

The following motion moved by Moshos and seconded by Laird, was approved (13-0-1).

Resolved: X3.4.3 directs the Chairman of X3.4.3 to seek approval from X3.4 and X3 for publication of the approved interpretations and related material.

### 6.2 Editor for Publication of Interpretations

The following motion, moved by Greenfield and seconded by Pfiefer, was approved (14-0-0).

Resolved: There shall be an editor whose duties are:

1. He shall put the approved material (except Procedure for X3.4.3 Approval of X3.4.3B Output), a list of items in process by X3.4.3B, and explanatory material in a form for publication.
2. He shall then circulate this material to the members of X3.4.3 for mail review. Objections must be sent to the editor within the deadline established by the editor.

The Chairman appointed Dennis Hamilton editor.

In answer to a query from the editor, the Committee suggested taking the authors' names off the interpretations, but including a list of participants in the introduction.

7. Mechanism For Extension to FORTRAN

Herb Bright directed remarks to the Committee regarding extensions to the standard. A summary of these remarks follows:

The establishment of the standards for FORTRAN (X3.9-1966) and Basic FORTRAN (X3.10-1966) does not discharge the Committee's duties toward the language and standards. There are many people working on supersets of FORTRAN and Basic FORTRAN. In particular there are people in SIGPLAN working on extensions to FORTRAN. We would be derelict in our duties if we don't communicate with these people or at least open lines of communication to this (X3.4.3) committee.

At this point in time it appears appropriate to provide a mechanism for orderly extensions to the language with the intent of extensions to the standard. We should appoint someone to look into finding people interested in extensions and then to define a scope of work. One approach might be to look into the feasibility of activating X3.4.3-1.

With these goals in mind, Bright moved and Hamilton seconded the following motion which was approved (13-0-1):

Resolved: X3.4.3 directs the Chairman to appoint an individual to explore and make recommendations as to a mechanism by which X3.4.3 should consider extension of FORTRAN, X3.9-1966.

The Chairman then appointed Frank Engel, Jr. for this task.

8. Items Discussed But No Action Taken

8.1 X3.4.3-1

In response to a query as to the status of X3.4.3-1, the Chairman replied "Inactive".

8.2 Relationship of ISO Intermediate to USASI Standards

Mrs. Holberton queried the Chairman on the U. S. position on three levels of FORTRAN. The Chairman replied that in 1964

ASA preferred two levels, not three. The present position may have to be reevaluated. He did not know what provision ISO has for maintenance of standards.

Discussion of the intermediate level continued and the following points were made:

1. In Europe, implementors started implementing intermediate FORTRAN and are now implementing full FORTRAN.
2. In the USA, Basic FORTRAN is not being implemented, but something close to intermediate FORTRAN is. This intermediate form is being called "full FORTRAN with restrictions."
3. As things appear to be heading, there are too many USA "intermediates". Something should be done to standardize on an acceptable intermediate level.
4. It is not in the scope of Engel's assignment to consider the matter of an intermediate FORTRAN.

### 8.3 Uniform Method of Claiming USASI Compatibility

Mr. Hamilton is concerned about FORTRAN implementations that are claimed to be USASI compatible. He asked the Committee to think about this problem and to consider the following points.

1. Anyone can say he has a USASI compatible compiler, regardless if he has or not. It is USASI policy not to take legal action against false claims.
2. There is no uniform method of stating an implementation that is USASI compatible. In most cases the claim of compatibility lives on the lips of salesmen.
3. Should there be a registry within USASI for implementations which claim to be, or are, USASI compatible?
4. Should X3 develop a uniform method for stating compatibility and/or listing the exceptions in a uniform manner?
5. Many implementors don't really know what is in the standard. They just think they do. It might help their understanding of the standard to have to state the exceptions to the standard.

### 9. Next Meeting

The next meeting is dependent upon X3.4.3B output and thus will be scheduled at a later date.

10. Adjournment

The Chairman thanked the Committee and the observers for the work accomplished.

The meeting was adjourned at 5:15 pm February 2, 1968.

Respectfully submitted,



Caral Sampson  
Secretary, USASI X3.4.3

APPENDIX A

X3.4.3 MAILING LIST

<u>NAME</u>	<u>REPRESENTING</u>	<u>WORK FOR</u>	<u>STATUS</u>
CARL B. BAILEY - 9422 SANDIA CORPORATION P.O. BOX 5800 ALBUQUERQUE, NEW MEXICO 87115 505/264-2076	SANDIA	SANDIA	VM
HERBERT S. BRIGHT COMPUTATION PLANNING INC. 7840 ABERDEEN ROAD WASHINGTON, D.C. 20014 301/654-0511 OR 654-8923	COMPUTATION PLANNING INC	COMPUTATION PLANNING INC	VM
LLOYD W. CAMPBELL BRL - CL ROOM 39A ABERDEEN PROVING GROUND, MD. 21005	U.S. ARMY BRL	U.S. ARMY BRL	VM
JOHN E. CRIDER SHELL DEVELOPMENT COMPANY P.O. BOX 481 HOUSTON, TEXAS 77001 3/667-5661 X372	SHELL DEVELOPMENT	SHELL DEVELOPMENT	OM
ROBERT DANEK NASA-GODDARD SPACE FLIGHT CENTER CODE 543-1 GREENBELT, MD. 20771	USE	NASA- GSFC	VM
FRANK ENGEL, JR. MITRE CORPORATION P.O. BOX 208 BEDFORD, MASS. 01730 617/271-2517	MITRE	MITRE	OM
MARTIN GREENFIELD HONEYWELL, INC 200 SMITH STREET MS 479 WALTHAM, MASSACHUSETTS 02154 617/891-8400 X2861	HONEYWELL	HONEYWELL	VM
DENNIS E. HAMILTON UNIVAC DIVISION SPERRY RAND O. BOX 8100 PHILADELPHIA, PA. 19101	X3.4.3B	UNIVAC	VM

215/MI6-9000 X3417

WILLIAM P. HEISING  
I  
1271 AVENUE OF THE AMERICAS  
NEW YORK, N.Y. 10020  
212/JU6-2050

IBM

CHAIRMAN

FRANCES E. HOLBERTON  
NATIONAL BUREAU OF STANDARDS  
BLDG 225 ROOM B256  
GAITHERSBURG, MD.  
301/921-3552

NBS

NBS

VM

RONALD E. JEFFRIES  
CDM-SHARE INC.  
1353 NORTH MAIN STREET  
ANN ARBOR, MICH 48103  
331/761-4040

COM-SHARE

OM

A. RICHARD JONES  
SHELL OIL COMPANY  
50 WEST 50TH STREET  
NEW YORK, N.Y. 10020  
212/586-5000 X2489

SHELL OIL CO.

SHELL OIL CO

VM

LT. DAVID W. KENNAMER  
U.S. ARMY  
COMPUTER SYSTEMS EVALUATION COMMAND  
WASHINGTON, D.C.

U.S. ARMY

U.S. ARMY

VM

E. W. KLEIN  
IBM  
1271 AVENUE OF THE AMERICAS  
NEW YORK, N.Y. 10020  
212/JU6-2050

IBM

IBM

VM

DONALD T LAIRD  
COMPUTER BUILDING  
THE PENNSYLVANIA STATE UNIVERSITY  
UNIVERSITY PARK, PA. 16801  
814/865-9527

ENGINEERS JOINT  
COUNCIL

PENN STATE  
UNIVERSITY

VM

JOHN G. NEUHAUS  
CONTROL DATA CORPORATION  
3145 PORTER DRIVE  
PALO ALTO, CALIF.

CDC

CDC

VM

C. J. PFEIFER  
WESTINGHOUSE BETTIS LABORATORY  
P.O. BOX 79  
WEST MIFFLIN, PA. 15122  
412/H02-8400

VIM

WESTINGHOUSE

VM

G. W. REITWEISNER  
OFFICE FOR INFORMATION PROCESSING STANDARDS  
CENTER FOR COMPUTER SCIENCES AND TECHNOLOGY  
NATIONAL BUREAU OF STANDARDS  
GAITHERSBURGH, MD.  
301/921-3551

NBS

NBS

OM

CARAL SAMPSON  
APPLIED DATA RESEARCH  
2425 WILSON BLVD  
ARLINGTON, VA. 22206-2220  
703/528-3141

APPLIED DATA  
RESEARCH

APPLIED DATA  
RESEARCH

VM

BOB SHEFF  
COM-SHARE  
1353 NORTH MAIN STREET  
ANN ARBOR, MICH. 48103  
313/761-4040

COM-SHARE

OM

KENNETH SHOSTACK  
DATA SYSTEMS SECTION  
RAYTHEON COMPANY  
528 BOSTON POST ROAD  
SUDBURY, MASSACHUSETTS 01776

RAYTHEON

RAYTHEON

VM

L. W. STROBEL  
NATIONAL CASH REGISTER CO.  
MAIN AND K STREETS  
DAYTON, OHIO  
513/449-6700

NCR

NCR

VM

HERBERT VAN BRINK  
UNION CARBIDE CORP - 42  
270 PARK AVENUE  
NEW YORK, N.Y. 10017

SHARE

UNION CARBIDE

VM

212/551-6526

JAMES I WILLIAMS  
BURROUGHS CORP.  
PAOLI, PENNA.  
215/NI4-4400 X589

BURROUGHS

BURROUGH

VM

APPENDIX B

ATTENDANCE

X3.4.3

February 2, 1968

Voting Members Present

1. Carl Bailey
2. Herb Bright
3. Lloyd Campbell
4. Robert Danek
5. Martin Greenfield
6. Dennis Hamilton
7. Wm. Heising
8. Frances Holberton
9. Arnold Jones
10. David Kenamer
11. E. W. Klein
12. Donald Laird
13. George Moshos
14. C. J. Pfeifer
15. Caral Sampson
16. Herb Van Brink
17. James Williams

Representing

Sandia  
Computation Planning, Inc.  
US Army - BRL  
USE  
Honeywell  
X3.4.3B  
  
NBS  
Shell Oil Company  
US Army - CSEC  
IBM  
Engineers Joint Council  
RCA  
VIM  
Applied Data Research  
SHARE  
Burroughs

Voting Members Absent

1. John O. Neuhaus
2. Len Strobel

Representing

CDC  
NCR

Observer Members Present

1. John Crider
2. Frank Engel, Jr.
3. Ronald Jeffries
4. George Reitweisner
5. Bob Sheff

Representing

Shell Development  
Mitre  
Com-Share, Inc.  
NBM  
Com-Share, Inc.

APPENDIX C

AGENDA

1. Opening
2. Minutes
3. Executive Committee Report
4. Membership
5. Report on ISO Meeting
6. Report From X3.4.3B
7. Old Business
8. New Business
9. Adjournment

## APPENDIX D

### Membership Rules for X3.4.3

It is important for the sound and responsible operation of X3.4.3 (FORTRAN) that its membership be qualified from the standpoint of technical background, interest, and support.

A member's technical background should consist of a general overall knowledge of the Programming Languages field and a specific knowledge of both the use and the implementation of FORTRAN language processors.

The member's interest must be sufficiently self-demanding that he will actively participate in handling of the tasks of the committee, review committee and other pertinent correspondence, and prepare for and regularly attend meetings.

Because the committee work will require time, travel and clerical service expenses, it will be necessary that each member have some sponsoring organization willing to absorb these costs.

1. There will be two forms of membership, a voter membership, and an observer membership.
  - a) Voter members may attend meetings, present motions, discuss motions during meetings, vote on motions, be eligible to hold committee office, and be on the mailing list for committee correspondence.
  - b) Observer members enjoy all of the privileges of voters, except that of presenting motions, voting on motions, and being eligible to hold committee office.
  - c) At any given meeting, a voter member is allowed to designate an alternate to assume the voter member's privileges for that meeting only. Request to designate an alternate shall be presented in writing to the Chairman. It is strongly recommended that the alternate be selected from the observer membership.

Should this section conflict in any way with the voting procedures of the committee, the voting procedures shall prevail.

2. Applications for voter membership shall be directed to the committee membership chairman who shall present a recommendation to the Committee to affirm or deny membership. Upon approval by a majority of the committee, the membership chairman shall inform the individual and the membership of X3.4.3. The approved member shall immediately enjoy all of the privileges of the affirmed type of membership.

Application for observer membership shall be directed to the membership chairman who shall affirm or deny observer membership.

3. Any voter member missing two consecutive meetings shall be placed in a provisional status. He shall be informed of this status by the membership chairman. If a member in provisional status misses the next meeting, he shall have his membership revoked. A voter member in provisional status will lose his voting privileges at the meeting he attends. Provisional status shall be removed following attendance at a meeting of the committee.

A voter member who designates an alternate in his absence shall still be charged with an absence. The chairman of the committee, however, shall be able to excuse the absence of any member, thereby setting aside the adverse effect of that absence on the individual's membership status.

4. The executive committee shall periodically review the sponsorship of the voter members of the committee to attempt to maintain a representative balance among the interests of the computer community. Voter membership shall not be allowed to more than one representative from a single sponsoring organization unless the executive committee rules that the scope of that sponsoring organization is broad enough to justify that representation is actually from two or more diverse interests. Each case shall be individually treated.

APPENDIX E

Transmittal From X3.4.3B



USA Standards Committee Correspondence

Address reply to:

TO: Dennis Hamilton, Chairman X3.4.3B  
FROM: Carol Sampson, Secretary X3.4.3B  
SUBJECT: Items approved by X3.4.3B for transmittal to X3.4.3

The first item approved by X3.4.3B was a clarification of the word rounding as it appeared in X3.9-1966 and X3.10-1966 as it relates to a USAS standard on rounding. This resolution is in section 6.1 of the minutes of X3.4.3B/1.

The next problem encountered by the Committee was the misalignment of line numbers and lines of text in the standard X3.9-1966. The lines on all pages are numbered 1 through 57 regardless of the number of lines on the page. Two problems were apparent. If a page has less than 57 lines, where are the blank lines? If a line has more than 57 lines, how are the new lines to be referenced? An approved solution to these problems is contained in Appendix J of X3.4.3B/3.

In producing interpretations to X3.9-1966, it became evident that the published standard was not the same (in content) as the document that had been voted on. In setting the standard in type, typographical and transcription errors had been introduced. Also someone had changed the format of some sections and introduced changes of content. These errors were detected and changes approved that make the standard (X3.9-1966) equivalent to the document that was voted on. These changes are in Appendix F and Appendix G of X3.4.3B/2. A convention used in Appendix F and Appendix G is that word or words which are to be italicized are in quotes and the changed word or words are underlined.

The last set of items approved by X3.4.3B are a proposed procedure for X3.4.3 approval of X3.4.3B output (section 6.1 and Appendix H of X3.4.3B/5) and actual interpretations (Appendix I of X3.4.3B/5).

1/10/68

E 1

The following item is taken from the minutes of the first meeting of X3.4.3B.

6. Actions Taken By the Committee

6.1 Rounding

The following statement was unanimously agreed on by the Committee.

In the X3.9-1966 and X3.10-1966 documents, the word "rounding", or some form thereof, is used. Note that the USASI standard on rounding is not applicable to X3.9-1966 and X3.10-1966. Note further that a rounding procedure is not specified in X3.9-1966 or X3.10-1966.

## APPENDIX F

### Typographical and Transcription Errors

In what follows, the new line or a comment is listed. Words originally in italics or to be in italics are in quotes. The changed word or words is underlined.

<u>page, line</u>	<u>new line or comment</u>
8, L49	*is not a superscript.
10, R28	*is not a superscript.
R29	*is not a superscript.
R30	*is not a superscript.
11, R10	*is not a superscript.
R12	**is not a superscript.
R20	**is not a superscript.
R24	*is not a superscript.
14, R17	terminal parameter; and " $m_3$ ", called the <u>incrementation</u>
R24	Associated with each DO statement is a " <u>range</u> " that is
15, L24	A DO is said to have an " <u>extended</u> "
L25	" <u>range</u> " if both of the following conditions apply:
17, R34	The dummy argument list of the <u>subprogram</u> must con-
19, L21	*is not a superscript.
L24	If a list contains more than one entry, the <u>entries</u> are
L29	*is not a superscript.
25, R57	ception to the <u>rule</u> requiring agreement of type. An actual
28, L14	in a type-statement as described previously) is imme-
28, R2	remove comma
R3	remove comma
R4	modification by the phrase ' <u> on the first level</u> '.
R7	remove second comma
R8	remove comma
29, L5	<u>come</u> defined or undefined accordingly.
34, R27	Subscripted variables may not be mentioned in <u>statement</u>
R28	<u>function definitions</u> . This corresponds to a restriction in many
36, R8	widely used in the USA, is given below in columns <u>8</u>
R9	through <u>54</u> in the same sequence as in 3.1.

## APPENDIX G

### Other Mechanical Flaws

In the development of X3.9-1966, editorial and style changes were made to conform with accepted ASA practice. Unfortunately some of these revisions changed content. In some cases parallelism of ideas was destroyed and a thought made a subsection of what was once a parallel thought. In other cases constructs of the form "A or B" were changed to "A and B" and others of the form "A and B or C and D" were changed.

The Committee has remedied these incorrect revisions by renumbering sections and changing the form of a list. In no instance has text been changed.

The items in this appendix and in APPENDIX F are to be considered as directions to a type-setter if X3.9-1966 is ever to be reprinted.

<u>page, line</u>	<u>new line or comment</u>
7, L28	1.2 Scope.
L29	1.2.1 This standard establishes:
L41	1.2.2 This standard does not prescribe:
14, R1	7.1.2.8 DO "Statement"
R2	7.1.2.8.1 A DO statement is of one of the forms:
R39	7.1.2.8.2 A DO statement is used to define a loop.
15, L24	7.1.2.8.3 A DO is said to have an "extended"
L54	7.1.2.8.4 The control variable, initial parameter, terminal
15, R29	7.1.3.1 "Properties of Input/Output Units." A particular
R30	unit has a single sequential file associated with it. The most
R31	general case of such a unit has the following properties:
18, L34	Lines L34 thru L45 of 7.2.1.3.1 should be made into
	one paragraph with no gaps. Actual punctuation changes
	necessary to accomplish this follow.
18, L37	name define that block such that
L38	<u>there is identity in type for all entities defined in</u>
L40	<u>block and</u>
L41	<u>if the block is labeled, the same number of</u>
L42	<u>entities is defined for the block,</u>
L45	<u>quantity in the executable program.</u>
L46	remove section number 7.2.1.3.1.1
21, L18	add section number 7.2.3.6.2.1
L39	add section number 7.2.3.6.2.2
L45	remove section number 7.2.3.6.2.1
21, R7	Lines R7 through R14 should be made into one paragraph
	with no gaps. Actual punctuation changes necessary to
	accomplish this follow.
21, R7	remove section number 7.2.3.6.2.2
R9	exponent part.
R10	remove first 3 characters from line.
R12	remove first 3 characters from line.
21, R15	add section number 7.2.3.6.2.3

<u>page, line</u>	<u>new line or comment</u>
24, L33	remove section number 8.3.1.1
L35	remove (1)
L42	remove (2)
L46	remove (3)
L49	remove (4)
L52	remove (5)
L56	remove (6)
25, L54	remove section number 8.4.1.1
L56	remove (1)
R39	remove (2)
R42	remove (3)
R45	remove (4)
R49	remove (5)
27, R45	lines R45 thru R50 of 10.1.5 should be made into one paragraph with no gaps. Actual punctuation changes necessary to accomplish this follow.
27, R46	if it appears
R47	<u>immediately</u> following the word SUBROUTINE in
R48	a SUBROUTINE statement or
R49	<u>immediately</u> following the word CALL in a CALL
29, L16	add section number 10.2.3.1
L31	change section number 10.2.3.1 to 10.2.3.2
29, R	note 29 right has 58 lines. Numbering from top--
R34	10.2.7.1 The following statements are block terminal statements:
R50	10.2.7.2 The following statements are block initial
30, L4	10.2.7.3 "Last Executable Statement".
30, L12	10.2.8.1 Redefinition of an integer entity causes all associated
L24	10.2.8.2 This definition persists until one of the
L30	At this time, the variable becomes unde-
L32	10.2.8.3 In addition, the occurrence of an integer variable in

G 3

E 6

## APPENDIX J

In dealing with errata to ASA X3.9 - 1966, a communication problem regarding line numbers became evident. This was due mainly to the pre-numbering of lines before the text was printed. Some pages contain more than 57 lines, other pages do not contain 57 lines. A device had to be found to associate line numbers with particular lines. Rather than list a line number and the text for the page, it became obvious that it was easier to specify which line numbers had no associated text (blank lines) and where line numbers must be added.

This appendix contains a list of line numbers with no associated text and indicates where to insert new line numbers. Application of this numbering scheme in no way affects the corrections made to date (X3.4.3B/2 Appendix F and Appendix G). All further references to the Standard assume the blank lines and new line numbers shown herein.

BLANK LINES IN X3.9 - 1966

PAGE

5 L+R: 2, 3, 5, 10, 18, 22, 28, 36, 47, 52  
6 L+R: 1, 18, 22, 24-57  
7 L+R: 2, 4-9, 11  
7 L: 20  
8 L: 32, 33, 35, 42, 44  
8 R: 23, 37, 46  
9 L: 19, 32, 33, 35  
9 R: 8, 35, 41, 42, 44  
10 L: 35  
10 R: 40  
11 L: 24, 25, 47, 48, 50  
11 R: 7, 32, 49  
12 L: 8, 18, 23, 38  
12 R: 18, 19, 21  
13 L: 10, 11, 14=, 16-, 30=  
and insert 17b, 21b, 28b, 32b, 35b, 38b  
14 L: 13, 21, 25, 28, 36, 45  
15 L: 26, 38  
15 R: 9  
16 L: insert 30b, 49b  
17 R: 14, 17=, 20-, 25=  
19 L: 8, 13, 23, 28, 32, 42  
19 R: 12, 39  
21 L: 49, 56-  
21 R: 36  
22 L: 52, 53, 55

22 R: 39 48  
23 L+R: 1-4, 7=, 10b-, 42, 49=, 52-57  
24 L: 21  
24 R: 18, 40, 50, 51  
25 L+R: 2b=, 6-, 31=, 34-36  
25 L: 44  
26 L: 44  
26 R: 5, 7  
27 L: 2, 44  
28 L: 39  
29 R: insert 58  
30 R: 12  
30 L+R: 44-57  
31 L+R: 2,4,6, 8, 9  
31 L: 11, 19-20, 23  
31 R: 23-24, 33-34, 37  
32 L: 4-5, 7  
32 R: 8-10, 13  
32 L+R: 36-57  
33 L+R: 2, 4-6, 8  
33 L: 50, 51, 53  
33 R: 20, 21, 23, 42, 44  
34 L: 4, 5, 7, 48-57  
34 R: 22-24, 26, 30-32, 34, 35, 48-57  
35 L+R: 2, 5-8, 35-57  
35 L: 16  
36 L+R: 5, 6, 11-57 *except for card*  
36 R: 10

J 3

## Proposed Procedure for X3.4.3 Approval of X3.4.3B Output

### Background:

The following excerpt from the minutes of the seventh meeting of X3.4.3 on February 23, 1967, in Washington, was the basis for both the establishment of technical subcommittee X3.4.3B and the action to be taken on its output:

"After discussion a minute was approved to 'establish a technical subcommittee operating under concensus rule to deal with questions of interpretations of, errors in, and omissions from the USASI FORTRAN specifications. The subcommittee is directed to forward non-controversial interpretations to X3.4.3 via a letter ballot for immediate release as approved interpretations. The subcommittee is directed to report to X3.4.3 any controversial matters which may arise for consideration at the next meeting of X3.4.3!"

Discussions with some of the experienced members of X3.4 (Ingerman, Heising, Gosden) have indicated that a consensus (no dissent) is required to establish an interpretation to an approved standard. This is more stringent than the approval requirement for the standard itself. The rationale is that the interpretation is not subjected to the same balloting checks as the standard. It is essentially the considered opinion of only the technical committee that was assigned maintenance responsibility. Therefore, there should not be any explicit dissent in that committee on what they establish as an interpretation.

X3.4.2 has recently produced a draft working document on Procedures for the Standardization Process (X3.4.2/67-5). They do not express any procedure for the maintenance of a standard in this document other than to acknowledge the existence of the problem and the need for a procedure (section 2.2) and the recommendation that a maintenance body be designated prior to the submission of a draft proposed standard to X3 (section 7).

It should be recognized that this procedure, if approved, may establish precedence for the maintenance of other standards within X3.4.

### Proposed Procedure:

1. Working drafts dealing with questions of interpretation, of, errors in, and omissions from the USASI FORTRAN specifications shall be submitted to technical subcommittee X3.4.3B in the form specified in Document Number X3.4.3B/4.
2. Technical subcommittee X3.4.3B after due consideration shall vote to determine whether a consensus exists (no dissent) on a working draft. Abstentions shall not be considered as dissent. If consensus is achieved, the working draft shall be designated non-controversial. If consensus is not achieved, the working draft shall be considered controversial.

3. The chairman of X3.4.3B shall inform the chairman of X3.4.3 of the working drafts<sup>that</sup> have been developed and voted upon by X3.4.3B for X3.4.3 to take subsequent action.
4. The chairman of X3.4.3 shall see to it that copies of the non-controversial working drafts are submitted to the voting members of X3.4.3 for letter ballot.

The letter ballot shall be returned to the chairman of X3.4.3. The ballot shall allow one of the following positions to be designated on each working draft:

- a) Unconditionally acceptable
- b) Abstention
- c) Acceptable if X3.4.3B will accept the following mandatory changes for the reasons attached
- d) Unacceptable for the reasons attached

Failure of an X3.4.3 voting member to respond to the letter ballot within 31 days of its mailing shall be recorded as an abstention (position b).

5. If all letter ballots recorded on a working draft are of positions a or b (unconditionally acceptable or abstention), the chairman of X3.4.3 shall forward the working draft to X3.4 with a request to publish as an approved interpretation or rectification of an error or omission from the standard.

If any letter ballots are of position c (acceptable if X3.4.3B will accept the following mandatory changes) and no letter ballots of position d (unacceptable) are received, the working draft shall be sent back to X3.4.3B. X3.4.3B shall consider the request for mandatory change. If they achieve consensus to the change, the altered working draft shall be resubmitted to the X3.4.3 voting members for a new letter ballot as though it ~~was~~ <sup>were</sup> a new non-controversial working draft.

6. X3.4.3B shall submit working drafts to X3.4.3 designated as controversial if any of the following occurred:
  - a) Consensus could not be achieved within X3.4.3B on one of their working drafts
  - b) Consensus could not be achieved within X3.4.3B on a mandatory change indicated in one or more of the returned X3.4.3 letter ballots
  - c) Any of the X3.4.3 returned letter ballots indicated that the working draft was unacceptable.

7. The chairman of X3.4.3 shall hold a meeting of the working committee X3.4.3 to determine whether resolution and consensus can be achieved on any controversial working draft. Should consensus be achieved within X3.4.3, the draft shall be forwarded to X3.4 with a request to publish as an approved interpretation.

If consensus of X3.4.3 cannot be obtained on a controversial working draft, then X3.4 shall be notified that a point exists that cannot be provided with an approved interpretation or rectification. X3.4.3 may include a recommendation that the question and the opposing opinions on it be published as an unresolved issue. This would at least clarify the point at issue to the computer community and may result in obtaining some valid suggestions leading to a resolution. X3.4.3 could at any later time reconsider the unresolved issue to determine whether consensus could then be obtained.

8. At his discretion, the chairman of X3.4.3 can choose to hold a meeting of the voting membership of X3.4.3 in order to vote directly upon working drafts submitted by X3.4.3B in lieu of letter balloting.

12.3 Revisions of Standards. Standards are industrial tools and should be kept in step with technological developments. It is, therefore, desirable for committees to maintain a continuing interest in the standards prepared under their supervision and to review them at periodic intervals (Procedure 215). So as to insure this review, the ASA By-Laws (Section B 4.2 (f) and (i) ) require such a review at least once in every five years with a view to reaffirmation or revision.

12.3.1 The problems of revision are usually much simpler than those of the development of a new standard. The steps taken are practically the same, but the work is less extensive, since the general framework is usually retained.

12.3.2 Any responsible body may at any time request the Association to consider the question of revision of a standard. (Procedure 216)

12.3.3 Supplements or addenda to standards are sometimes produced to meet conditions not known or understood at the time the standard was developed, or for purposes of clarification or interpretation. In order that these may receive the widest recognition possible, sponsors are encouraged to take formal letter ballot on such interim revisions and, upon approval, to submit them to ASA for approval as American Standard requirements. Upon approval by ASA they may be published on a sheet for insertion in the published standard and given wide publicity through every possible channel. In this way those having reason to comply with the provisions of a standard will have no hesitation in using the interim revision before it would otherwise be known to be official.

12.4 Interpretation of Standards. Official interpretation of particular clauses or parts of a standard should be issued only by authority of the committee, or of a subcommittee specifically authorized to do so. Such a subcommittee may be a standing committee with fixed personnel, or provision may be made for modification of personnel for specific cases as they arise. Individuals having a direct commercial interest in a question under discussion should not sit on an interpretation committee. All interpretations released to inquirers by the subcommittee should be reported at the time of release to the full committee for approval. If the decision of the subcommittee is not unanimous, the question should be referred to the full committee and no interpretation should be released prior to such action except in very unusual circumstances. Interpretations, when reported to the full committee, may well be considered for incorporation in substance into the standard for the purposes of clarification. (SC Min 2562, 11-30-32)

### 13. Other Methods of Work

13.1 While this document is devoted to the Sectional Committee Method, other methods of developing and revising standards are available. Presently recognized are:

- (1) The Existing Standards Method
- (2) The General Acceptance Method
- (3) The Proprietary Method

13.2 Under the Existing Standards Method any existing standard may be approved by the ASA through a simplified process, provided it is shown that it is supported by the necessary consensus of those substantially concerned with its scope and provisions. (Procedure 301)

APPENDIX I

Approved Interpretations

X3.4.3B/5

Status:

APPROVED

X3.4.3B

9 November 1967

Number:

USAS X3.9-1966/#2

16 October 1967

Title:

Character Blank and Leading Zeros in Statement Label Field

Descriptors:

statement label	columns 1 through 5
initial line	leading zeros
character blank	blank character

Topic:

What is the effect of the character blank or leading zeros on the interpretation of columns 1 through 5 as a statement label?

References:

3.1.4.1	Blank Character
3.2.3	Initial Line
3.4	Statement Label

Interpretation:

The last sentence of section 3.2.3 intends to indicate that an initial line has no statement label *if and* only if columns 1 through 5 all contain the character blank.

Leading zeros and leading, trailing and interspersed appearances of the character blank in columns 1 through 5 are not significant in differentiating statement labels (sections 3.1.4.1 and 3.4).

The following examples all represent the same statement label:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
		9	9	9																								
	9	9	9																									
	9		9	9																								
	0	9	9	9																								
	0	9	9	9																								

Rationale:

A statement label consists of one to five digits placed anywhere in columns 1 through 5 (section 3.4).

An initial line contains no statement label if *and only if* columns 1 through 5 each contains the character blank (section 3.2.3).

Leading zeros are not significant in differentiating statement labels (section 3.4).

The character blank may be used freely to improve the appearance of a program (3.1.4.1). The appearance of the character blank in columns 1 through 5 is not one of the stated exceptions to this rule cited in section 3.1.4.1.

Question:

Doc.#X3.4.3B/1, Appendix C, Item 2

"Section 3.2.3 is confusing. The wording of the last sentence implies that either the statement label occupies columns 1-5 or these columns are each blank. Is this meant to preclude possibilities such as a statement label in columns 1-3 with 4-5 blank?"

M. N. Greenfield

Status: APPROVED X3.4.3B 10 November 1967

Number: USAS X3.9 - 1966/#3 1 November 1967

Title: Continuation Lines: Columns 1 through 6

Descriptors: continuation line columns 1 through 6  
statement label columns 1 through 5

Topic: What characters can appear in columns 1 through 6  
of a continuation line?

References: 3.1 The FORTRAN Character Set  
3.2 Lines  
3.2.4 Continuation Line

Interpretation: Column 1 of a continuation line may contain any character from the FORTRAN character set except the character "C". Each of columns 2 through 5 of a continuation line may contain any character from the FORTRAN character set. Column 6 of a continuation line may contain any character from the FORTRAN character set except the characters blank and zero.

In practice, columns 1 through 5 of a continuation line usually contain the character blank. However, some users place a copy of the statement label of an initial line in columns 1 through 5 of its continuation lines.

Rationale: Section 3.2.4 prohibits a "C" in column 1 of a continuation line and prohibits a blank or zero in column 6 of a continuation line. Section 3.2 requires columns 1 through 6 of all lines to contain characters from the FORTRAN character set. The standard places no other limitations on the contents of columns 1 through 6 of a continuation line.

Therefore, the user may place any characters from the FORTRAN character set in columns 1 through 6 of a continuation line, provided the restrictions of 3.2.4 are observed.

USAS X3.9-1966/#3

Question:

Doc. #X3.4.3B/1, Appendix C, Item 3

"Section 3.3 does not refer to columns 1-6 of a continuation line except to forbid a 'C' in column 1 and '0' or blank in column 6. Can these columns thus be used for further comment information in keeping with these provisions?"

Caral Sampson

A.R. Jones

Status: APPROVED X3.4.3B 10 November 1967

Number: USAS X3.9-1966/#5 1 November 1967

Title: Definition of Constants

Descriptors: constant  
definition  
defined

Topic: What does Section 5.1.1 mean when it states "A constant is a datum that is always defined during execution...?"

References: 4.1 Data Type Association  
5. Data and Procedure Identification  
5.1.1 Constants

Interpretation: A constant acts as a datum whose type and value are determined solely by the characters of its literal occurrence. (The presence of the character blank in the string representing the constant is subject to the rules appearing in Section 3.1.4.1.) The value identified is always the same and is available when necessary. The standard places no further requirement on how or when the value of the constant must be provided.

Note that there is no way to change the value of a constant. For example, none of the following statements admits of an interpretation:

```
S=A  
READ (1,2) S  
CALL X(5) where a value is assigned to the dummy  
argument of subroutine X
```

Rationale: The word 'defined' in Section 5.1.1 is not related to "assigning a value to a datum" as explained in Section 5, second paragraph. 'Defined' in Section 5.1.1 means that during execution of a program an occurrence of a constant assures the availability of the value determined by the form of the string representing the constant (4.1).

Question:

Doc. #X3.4.3B/1, Appendix C, Item 5

"Section 5.1.1 Constants - 'A constant is a datum that is always defined during execution....'. In 4.1, the sentence 'The form of the string representing a constant defines both the value and the data type.' implies the action takes place prior to execution not 'during'.

"The phrase 'defined during execution' in Section 5.1.1, paragraph 2, implies a dynamic process at the time, and is therefore misleading."

Caral Sampson

R. Karpinski

Status: APPROVED X3.4.3B 10 November 1967

Number: USAS X3.9-1966/#8 17 October 1967

Title: Alternative Forms of a Statement

Descriptors: alternative forms forms

Topic: When the Standard displays alternative forms of a statement (or part of a statement), is it giving an option to the user or to the processor?

References:

1.1	Purpose
7.1.2.4	CALL Statement
7.1.2.7.1	STOP Statement
7.1.2.7.2	PAUSE Statement
7.1.2.8	DO Statement
7.1.3.2.1	Input/Output Lists
7.1.3.2.2	Formatted READ
7.1.3.2.3	Formatted WRITE
7.1.3.2.4	Unformatted READ
8.4.1	Defining Subroutine Subprograms

Interpretation: The user has the option of writing the statement (or part of a statement) in either of the specified ways. The processor must accept both forms.

Rationale: Section 1.1 provides justification for the interpretation. It reads, in part: "A processor shall conform to this standard provided it accepts, and interprets as specified, at least those forms and relationships described herein."

In the case of alternative forms of statements, both forms are described and, therefore, both must be accepted and interpreted as specified.

Question: Doc.#X3.4.3B/1, Appendix C, Item 8

"Section 7.1.2.7 STOP and PAUSE - It is not clear whether a processor must accept both forms of these statements...."

E. W. Klein

Status: APPROVED X3.4.3B 11 November 1967

Number: USAS X3.9-1966/#36 17 October 1967

Title: Accessibility of n in a STOP Statement

Descriptors: octal digit string  
STOP n

Topic: In a STOP statement, is n accessible?

Reference: 7.1.2.7.1 STOP Statement  
USAS X3.9-1966/#8 Alternative Forms of a Statement

Interpretation: The following sentence should be appended to the last paragraph of 7.1.2.7.1 :  
"The disposition of the octal digit string is not specified."

Rationale: The accessibility of n in a STOP statement is intentionally not specified in the standard. By not so specifying, the standard permits the practice of terminating program execution without necessarily making n accessible.

Question: Doc. #X3.4.3B/1, Appendix C, Item 8  
"Section 7.1.2.7 STOP and PAUSE ... In the case of the STOP Statement, no mention is made of the use of n."

E. W. Klein

Procedure for X3.4.3 Approval of X3.4.3B OutputBackground:

The following excerpt from the minutes of the seventh meeting of X3.4.3 on February 23, 1967, in Washington, was the basis for both the establishment of technical subcommittee X3.4.3B and the action to be taken on its output:

"After discussion a minute was approved to 'establish a technical subcommittee operating under concensus rule to deal with questions of interpretations of, errors in, and omissions from the USASI FORTRAN specifications. The subcommittee is directed to forward non-controversial interpretations to X3.4.3 via a letter ballot for immediate release as approved interpretations. The subcommittee is directed to report to X3.4.3 any controversial matters which may arise for consideration at the next meeting of X3.4.3:"

Discussions with some of the experienced members of X3.4 (Ingerman, Heising, Gosden) have indicated that a consensus (no dissent) is required to establish an interpretation to an approved standard. This is more stringent than the approval requirement for the standard itself. The rationale is that the interpretation is not subjected to the same balloting checks as the standard. It is essentially the considered opinion of only the technical committee that was assigned maintenance responsibility. Therefore, there should not be any explicit dissent in that committee on what they establish as an interpretation.

X3.4.2 has recently produced a draft working document on Procedures for the Standardization Process (X3.4.2/67-5). They do not express any procedure for the maintenance of a standard in this document other than to acknowledge the existence of the problem and the need for a procedure (section 2.2) and the recommendation that a maintenance body be designated prior to the submission of a draft proposed standard to X3 (section 7).

It should be recognized that this procedure, if approved, may establish precedence for the maintenance of other standards within X3.4.

Proposed Procedure:

1. Working drafts dealing with questions of interpretation of, errors in, and omissions from the USASI FORTRAN specifications shall be submitted to technical subcommittee X3.4.3B in the form specified in Document Number X3.4.3B/4.
2. Technical subcommittee X3.4.3B after due consideration shall vote to determine whether a consensus exists (no dissent) on a working draft. Abstentions shall not be considered as dissent. If consensus is achieved, the working draft shall be designated non-controversial. If consensus is not achieved, the working draft shall be considered controversial.

3. The chairman of X3.4.3B shall inform the chairman of X3.4.3 of the working drafts <sup>that</sup> have been developed and voted upon by X3.4.3B for X3.4.3 to take subsequent action.
4. The chairman of X3.4.3 shall see to it that copies of the non-controversial working drafts are submitted to the voting members of X3.4.3 for letter ballot.

The letter ballot shall be returned to the chairman of X3.4.3. The ballot shall allow one of the following positions to be designated on each working draft:

- a) Unconditionally acceptable
- b) Abstention
- c) Acceptable if X3.4.3B will accept the following mandatory changes for the reasons attached
- d) Unacceptable for the reasons attached

Failure of an X3.4.3 voting member to respond to the letter ballot within 31 days of its mailing shall be recorded as an abstention (position b).

5. If all letter ballots recorded on a working draft are of positions a or b (unconditionally acceptable or abstention), the chairman of X3.4.3 shall forward the working draft to X3.4 with a request to publish as an approved interpretation or rectification of an error or omission from the standard.

If any letter ballots of position c (acceptable if X3.4.3B will accept the following mandatory changes) or letter ballots of position d (unacceptable) are received, the working draft shall be sent back to X3.4.3B. X3.4.3B shall consider the request for mandatory change. If they achieve consensus to the change, the altered working draft shall be resubmitted to the X3.4.3 voting members for a new letter ballot as though it ~~was~~ a new non-controversial working draft.

6. X3.4.3B shall submit working drafts to X3.4.3 designated as controversial if any of the following occurred:
- a) Consensus could not be achieved within X3.4.3B on one of their working drafts
  - b) Consensus could not be achieved within X3.4.3B on a mandatory change indicated in one or more of the returned X3.4.3 letter ballots
  - c) Any of the X3.4.3 returned letter ballots indicated that the working draft was unacceptable.

7. The chairman of X3.4.3 shall hold a meeting of the working committee X3.4.3 to determine whether resolution and consensus can be achieved on any controversial working draft. Should consensus be achieved within X3.4.3, the draft shall be forwarded to X3.4 with a request to publish as an approved interpretation.

If consensus of X3.4.3 cannot be obtained on a controversial working draft, then X3.4 shall be notified that a point exists that cannot be provided with an approved interpretation or rectification. X3.4.3 may include a recommendation that the question and the opposing opinions on it be published as an unresolved issue. This would at least clarify the point at issue to the computer community and may result in obtaining some valid suggestions leading to a resolution. X3.4.3 could at any later time reconsider the unresolved issue to determine whether consensus could then be obtained.

8. At his discretion, the chairman of X3.4.3 can choose to hold a meeting of the voting membership of X3.4.3 in order to vote directly upon working drafts submitted by X3.4.3B in lieu of letter balloting.

12.3 Revisions of Standards. Standards are industrial tools and should be kept in step with technological developments. It is, therefore, desirable for committees to maintain a continuing interest in the standards prepared under their supervision and to review them at periodic intervals (Procedure 215). So as to insure this review, the ASA By-Laws (Section B 4.2 (f) and (i)) require such a review at least once in every five years with a view to reaffirmation or revision.

12.3.1 The problems of revision are usually much simpler than those of the development of a new standard. The steps taken are practically the same, but the work is less extensive, since the general framework is usually retained.

12.3.2 Any responsible body may at any time request the Association to consider the question of revision of a standard. (Procedure 216)

12.3.3 Supplements or addenda to standards are sometimes produced to meet conditions not known or understood at the time the standard was developed, or for purposes of clarification or interpretation. In order that these may receive the widest recognition possible, sponsors are encouraged to take formal letter ballot on such interim revisions and, upon approval, to submit them to ASA for approval as American Standard requirements. Upon approval by ASA they may be published on a sheet for insertion in the published standard and given wide publicity through every possible channel. In this way those having reason to comply with the provisions of a standard will have no hesitation in using the interim revision before it would otherwise be known to be official.

12.4 Interpretation of Standards. Official interpretation of particular clauses or parts of a standard should be issued only by authority of the committee, or of a subcommittee specifically authorized to do so. Such a subcommittee may be a standing committee with fixed personnel, or provision may be made for modification of personnel for specific cases as they arise. Individuals having a direct commercial interest in a question under discussion should not sit on an interpretation committee. All interpretations released to inquirers by the subcommittee should be reported at the time of release to the full committee for approval. If the decision of the subcommittee is not unanimous, the question should be referred to the full committee and no interpretation should be released prior to such action except in very unusual circumstances. Interpretations, when reported to the full committee, may well be considered for incorporation in substance into the standard for the purposes of clarification. (SC Min 2562, 11-30-32)

### 13. Other Methods of Work

13.1 While this document is devoted to the Sectional Committee Method, other methods of developing and revising standards are available. Presently recognized are:

- (1) The Existing Standards Method
- (2) The General Acceptance Method
- (3) The Proprietary Method

13.2 Under the Existing Standards Method any existing standard may be approved by the ASA through a simplified process, provided it is shown that it is supported by the necessary consensus of those substantially concerned with its scope and provisions. (Procedure 301)

APPENDIX G

Interpretations Approved By X3.4.3

2 February 1968

X3.4.3/2

Status:

APPROVED

X3.4.3

2 February 1968

Number:

USAS X3.9-1966/#2

16 October 1967

Title:

Character Blank and Leading Zeros in Statement Label Field

Descriptors:

statement label  
initial line  
character blank

columns 1 through 5  
leading zeros  
blank character

Topic:

What is the effect of the character blank or leading zeros on the interpretation of columns 1 through 5 as a statement label?

References:

3.1.4.1 Blank Character  
3.2.3 Initial Line  
3.4 Statement Label

Interpretation:

The last sentence of section 3.2.3 intends to indicate that an initial line has no statement label if and only if columns 1 through 5 all contain the character blank.

Leading zeros and leading, trailing and interspersed appearances of the character blank in columns 1 through 5 are not significant in differentiating statement labels (sections 3.1.4.1 and 3.4).

The following examples all represent the same statement label:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
		9	9	9																									
	9	9	9																										
	9	9	9																										
	0	9	9	9																									
	0	9	9	9																									

Rationale:

A statement label consists of one to five digits placed anywhere in columns 1 through 5 (section 3.4).

An initial line contains no statement label if and only if columns 1 through 5 each contains the character blank (section 3.2.3).

Leading zeros are not significant in differentiating statement labels (section 3.4).

The character blank may be used freely to improve the appearance of a program (3.1.4.1). The appearance of the character blank in columns 1 through 5 is not one of the stated exceptions to this rule cited in section 3.1.4.1.

Question:

Doc. #X3.4.3B/1, Appendix C, Item 2

"Section 3.2.3 is confusing. The wording of the last sentence implies that either the statement label occupies columns 1-5 or these columns are each blank. Is this meant to preclude possibilities such as a statement label in columns 1-3 with 4-5 blank?"

M. N. Greenfield

Status: APPROVED X3.4.3 2 February 1968

Number: USAS X3.9 - 1966/#3 1 November 1967

Title: Continuation Lines: Columns 1 through 6

Descriptors: continuation line columns 1 through 6  
statement label columns 1 through 5

Topic: What characters can appear in columns 1 through 6  
of a continuation line?

References: 3.1 The FORTRAN Character Set  
3.2 Lines  
3.2.4 Continuation Line

Interpretation: Column 1 of a continuation line may contain any character from the FORTRAN character set except the character "C". Each of columns 2 through 5 of a continuation line may contain any character from the FORTRAN character set. Column 6 of a continuation line may contain any character from the FORTRAN character set except the characters blank and zero.

In practice, columns 1 through 5 of a continuation line usually contain the character blank. However, some users place a copy of the statement label of an initial line in columns 1 through 5 of its continuation lines.

Rationale: Section 3.2.4 prohibits a "C" in column 1 of a continuation line and prohibits a blank or zero in column 6 of a continuation line. Section 3.2 requires columns 1 through 6 of all lines to contain characters from the FORTRAN character set. The standard places no other limitations on the contents of columns 1 through 6 of a continuation line.

Therefore, the user may place any characters from the FORTRAN character set in columns 1 through 6 of a continuation line, provided the restrictions of 3.2.4 are observed.

USAS X3.9-1966/#3

Question:

Doc. #X3.4.3B/1, Appendix C, Item 3

"Section 3.3 does not refer to columns 1-6 of a continuation line except to forbid a 'C' in column 1 and '0' or blank in column 6. Can these columns thus be used for further comment information in keeping with these provisions?"

Caral Sampson

A.R. Jones

Status: APPROVED X3.4.3 2 February 1968

Number: USAS X3.9-1966/#5 1 November 1967

Title: Definition of Constants

Descriptors: constant  
definition  
defined

Topic: What does Section 5.1.1 mean when it states "A constant is a datum that is always defined during execution...?"

References: 4.1 Data Type Association  
5. Data and Procedure Identification  
5.1.1 Constants

Interpretation: A constant acts as a datum whose type and value are determined solely by the characters of its literal occurrence. (The presence of the character blank in the string representing the constant is subject to the rules appearing in Section 3.1.4.1.) The value identified is always the same and is available when necessary. The standard places no further requirement on how or when the value of the constant must be provided.

Note that there is no way to change the value of a constant. For example, none of the following statements admits of an interpretation:

```
5=A  
READ (1,2) 5  
CALL X(5) where a value is assigned to the dummy  
argument of subroutine X
```

Rationale: The word 'defined' in Section 5.1.1 is not related to "assigning a value to a datum" as explained in Section 5, second paragraph. 'Defined' in Section 5.1.1 means that during execution of a program an occurrence of a constant assures the availability of the value determined by the form of the string representing the constant (4.1).

Question:

Doc. #X3.4.3B/1, Appendix C, Item 5

"Section 5.1.1 Constants - 'A constant is a datum that is always defined during execution....'. In 4.1, the sentence 'The form of the string representing a constant defines both the value and the data type.' implies the action takes place prior to execution not 'during'.

"The phrase 'defined during execution' in Section 5.1.1, paragraph 2, implies a dynamic process at the time, and is therefore misleading."

Caral Sampson

R. Karpinski

Status: APPROVED X3.4.3 2 February 1968  
Number: USAS X3.9-1966/#8 17 October 1967  
Title: Alternative Forms of a Statement  
Descriptors: alternative forms forms  
Topic: When the Standard displays alternative forms of a statement (or part of a statement), is it giving an option to the user or to the processor?

References:

1.1	Purpose
7.1.2.4	CALL Statement
7.1.2.7.1	STOP Statement
7.1.2.7.2	PAUSE Statement
7.1.2.8	DO Statement
7.1.3.2.1	Input/Output Lists
7.1.3.2.2	Formatted READ
7.1.3.2.3	Formatted WRITE
7.1.3.2.4	Unformatted READ
8.4.1	Defining Subroutine Subprograms

Interpretation: The user has the option of writing the statement (or part of a statement) in either of the specified ways. The processor must accept both forms.

Rationale: Section 1.1 provides justification for the interpretation. It reads, in part: "A processor shall conform to this standard provided it accepts, and interprets as specified, at least those forms and relationships described herein."

In the case of alternative forms of statements, both forms are described and, therefore, both must be accepted and interpreted as specified.

Question: Doc. #X3.4.3B/1, Appendix C, Item 8

"Section 7.1.2.7 STOP and PAUSE - It is not clear whether a processor must accept both forms of these statements...."

E. W. Klein

Status: APPROVED X3.4.3 2 February 1968

Number: USAS X3.9-1966/#36 17 October 1967

Title: Accessibility of n in a STOP Statement

Descriptors: octal digit string  
STOP n

Topic: In a STOP statement, is n accessible?

Reference: 7.1.2.7.1 STOP Statement  
USAS X3.9-1966/#8 Alternative Forms of a Statement

Interpretation: The following sentence should be appended to the last paragraph of 7.1.2.7.1 :

"The disposition of the octal digit string is not specified."

Rationale: The accessibility of n in a STOP statement is intentionally not specified in the standard. By not so specifying, the standard permits the practice of terminating program execution without necessarily making n accessible.

Question: Doc. #X3.4.3B/1, Appendix C, Item 8

"Section 7.1.2.7 STOP and PAUSE ... In the case of the STOP Statement, no mention is made of the use of n."

E. W. Klein