X11/96-67

MUMPS Development Committee

Extension to the MDC Standard
Type A Release of the MUMPS Development Committee

Leading Zero in $FN

September 29, 1996

Produced by the MDC Subcommittee #13
Data Management and Manipulation

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The reader is hereby notified that the following MDC specification has been approved by the MUMPS Development Committee but that it may be a partial specification that relies on information appearing in many parts of the MDC Standard. This specification is dynamic in nature, and the changes reflected by this approved change may not correspond to the latest specification available.

Because of the evolutionary nature of MDC specifications, the reader is further reminded that changes are likely to occur in the specification released, herein, prior to a complete republication of the MDC Standard.

1. Identification of the Proposed Change

1.1 Title

Leading Zero in $FN

1.2 MDC Proposer and Sponsor

Proposer
Task Group 17
Interpretations
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1.3 Motion

None. Final version approved by MDC on September 29, 1996. This document supersedes X11/SC13/96–4.

1.4 History

13 Oct 1996	X11/96-67	Final document.
29 Sep 1996	X11/SC13/96–4	Accepted by MDC as type A, 27:0:1.
20 Mar 1996	X11/SC13/95–26	SC13 accepted as type A, 15:0:3.
03 Jun 1995	X11/SC13/95–7	SC13 accepted as type B, 19:0:4.
05 Feb 1995	X11/95–19	Interpretation published.
29 Jan 1995	X11/TG17/94–7	Interpretation accepted by MDC, 27:0:2.
13 Dec 1994	X11/TG17/94–7	Accepted by the Interpretations Task Group without dissent.

1.5 Dependencies

This proposal modifies ANSI/MDC X11.1–1995.

Proposals that depend on this proposal: none.

2. Justification of the Proposed Change

2.1 Needs

National Institute of Standards and Technology (NIST) has questioned whether the following sentence in the description of the three-argument form of $FN, ANSI/MDC X11.1–1990 clause 2.2.7.6, applies to the two-argument form of $FN as well. (X11/94–44, problem statement ID#44, "Leading Zero Ambiguity in the $FNUMBER Function.")

> Note: if (–1 < numexpr < 1), the result of $FN has a leading zero ("0") to the left of the decimal point.

ANSI/MDC X11.1–1995 contains the same wording.

2.2 Existing Practice in Area of the Proposed Change

7.1.5.6 describes the two-argument form of $FN(numexpr , fncodexpr):

> . . . returns a value which is an edited form of numexpr. . . .
>
> If fncodexpr equals an empty string, no special formatting is performed and the result of the expression is the original value of numexpr.

7.1.4.3 Numeric Data Values:

> d. The number zero is represented by the one-character string "0".
>
> h. The representation of each positive number less than 1 consists of a "." followed by a nonempty digit string with no trailing zero. (This is called a *fraction*.)

7.1.4.5 defines the form of negative numbers as a transformation of positive numbers.

7.1.5.6 describes the three-argument form of $FN:

> This form is identical to the two-argument form of $FN, except that numexpr is rounded to intexpr fraction digits, including possible trailing zeros, before processing any fncodatoms. If intexpr is zero, the evaluated numexpr contains no decimal point. Note: if (–1 < numexpr < 1), the result of $FN has a leading zero ("0") to the left of the decimal point.

The MDC has interpreted both standards as described in 3.

2.3 Justification

7.1.5.6 says for the two-argument form that there shall be no leading zero when (–1 < numexpr < 1) and fncodexpr equals the empty string. Absent any mention of the leading zero in specifying the editing actions of other values of fncodexpr, consistency requires no leading zero for all values of fncodexpr.

Furthermore, the specification of the leading zero in the three-argument form of $FN occurs in a paragraph describing the differences between the three-argument and the two-argument forms.

3. Description of the Proposed Change

3.1 General Description of the Proposed Change

This proposal modifies the 1995 standard in accordance with the MDC's interpretation of January 1995 by specifying two-argument $FN to return no leading zero when (–1 < numexpr < 1).

3.2 Annotated Examples of Use

```
F VAL=-.4,.35 W $FN(VAL,"+"),"    "
-.4    +.35
```

3.3 Formalization

Strike the following paragraph of ANSI/MDC X11.1–1995, clause 7.1.5.6:

> This form returns a value which is an edited form of numexpr. Each fncodatom is applied to numexpr in formatting the results by the following rules (order of processing is not significant):

and insert in its place:

> This form shall return a value that is the value of numexpr edited by applying each fncodatom according to the following rules. The order of application is not significant:

Insert "this form of" into the clause 7.1.5.6 paragraph describing the 3-argument form:

> This form is identical to the two-argument form of $FNUMBER, except that numexpr is rounded to intexpr fraction digits, including possible trailing zeros, before processing any fncodatoms. If intexpr is zero, the evaluated

numexpr contains no decimal point. Note: if (–1 < numexpr < 1), the result of this form of $FNUMBER has a leading zero ("0") to the left of the decimal point. Negative values of intexpr are reserved for future extensions of the $FNUMBER function.

4. Implementation Effects

4.1 Effect on Existing User Practices and Investments

Users should verify the behavior of their implementation. Routines that are intended to be portable and that depend on the functions specified herein may need to be changed.

4.2 Effect on Existing Vendor Practices and Investments

Vendors should verify their implementations and notify their customers of nonconformance or of changes made to achieve conformance.

4.3 Techniques and Costs for Compliance Verification

This interpretation agrees with the conformance test MVTS V.8.2 from MUMPS Systems Laboratory as quoted in the NIST question (see 2.1) and its accompanying letter to the MDC.

4.4 Legal Considerations

The NIST question arises from different interpretations of the 1990 standard by Micronetics Design Corporation and by MUMPS Systems Laboratory.

5. Closely Related Standards Activities

5.1 Other X11 Proposals Under Consideration

X11/96–32 Sign of Zero in $FN also amends the text of 7.1.5.6.

5.2 Other Related Standards Efforts

None.

5.3 Recommendations for Coordinating Liaison

None.

6. Associated Documents

None.

7. Issues, Pros and Cons, and Discussion

The Interpretations Task Group interpreted the standard as written. This proposal makes that interpretation an explicit change to the standard; however it also presents an opportunity to amend that standard.

7.1 January 1995 MDC meeting

No pros and cons offered.

7.2 June 1995 MDC meeting

Pro

1 Answers NIST question (3)

2 Disambiguates standard (4)

Con

(Number of citations in the vote.)

7.3 March 1996 MDC meeting

Pro

1 Resolves issues raised by NIST (5)

Con

1 Editing error in placement of Pros/Cons (2)

(Number of citations in the vote.)

7.4 September 1996 MDC meeting

Pro

1 Resolves issue raised by NIST (10)

Con

(Number of citations in the vote.)