

X11/1993-39

MUMPS Development Committee

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

\$REFERENCE

20 June 1993
Produced by the MDC Subcommittee #15
Programming Structures

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MUMPS Development Committee

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1 IDENTIFICATION

1.1 Title

\$REFERENCE

1.2 MDC Proposer and Sponsor

Proposer

MUMPS Development Coordinating
Committee of Europe (MDCCE)

Sponsor

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1.3 History

At numerous occasions, various members of MDC have expressed their concern that it is difficult to maintain software that makes use of naked references. This new proposal addresses one way of solving this problem.

Date	Doc #	Action
Oct 1993	This document	Formal write-up.
Jun 1993	XII/SCI3/93-29	Approved as MDC Type A (39:0:5). <i>(Presented for promotion to MDC Type A.)</i>
Feb 1993	XII/SCI3/93-7	Approved as SCI3 Type A (17:1:2). <i>(Changed specifications of <u>svn</u> and <u>leftrestricted</u> to become additions to lists, rather than explicit replacements of lists. Added phrase suggested by 'Naked Indicator after \$QUERY' task group. Presented for promotion to SCI3 Type A.)</i>
Oct 1992	XII/SCI3/92-39	<i>(Addition incorporated as discussed at previous meeting. Presented for promotion to SCI3 Type A.)</i>
Jun 1992	XII/SCI3/92-16	Approved as SCI3 Type B.
Feb 1992	XII/SCI3/91-6	<i>(History section put in correct order. Modifications applied, per guidance in October 1991 meeting. Discussed by task group. Task group was divided over final form of document; equally divided over the various alternatives. Principle of least surprise: @\$REFERENCE should never modify the naked indicator.)</i>
Oct 1991	XII/SCI/91-63	Reaffirmed as SCI Type B. <i>(Presented for promotion to SCI Type A. Voted to allow SET</i>

\$REFERENCE="".)

Jun 1991 XII/SCI/TG22/91-2 Approved as SCI Type B.
(No new cons raised.)

Oct 1990 XII/SCI/90-62 Approved as SCI Type C.
(Presented for acceptance as SCI Type C, referred to task group.)

Pros and Cons in October 1990

Pro

1. Needed functionality
2. Already implemented
3. \$NAME does not fully support functionality

Con

1. Should not refer to “naked indicator”
2. \$NAME supplies functionality
3. Encourages use of naked references
4. Should be Settable

A motion to correct spelling, changing \$REFERENCE to \$REFERENCE passed by voice vote without dissent.

A motion to remove “, on which the current value of the naked indicator is based” from the formal specification in clause 3.3 failed.

A motion to remand this proposal to a task group passed (17:5:2).

A motion to remand document XII/SCI/90-54, \$REFERENCE, to the same task group passed by voice vote.

SCI TG22 was created and Ed de Moel was named chair. The scope of work was defined as: *Evaluate the merits of proposals regarding the functionality of saving and restoring the value of the naked indicator. At least Bundy's and De Moel's proposals need to be considered as well as current implementations.*

During this meeting a number of other, more or less related proposals was discussed. A number of these were remanded to SCI TG22 and SCI TG24 (chaired by Kate Schell). Later in the meeting, these two task groups were combined. These documents were:

- XII/SCI/90-59-6C, *Naked reference on READ*
- XII/SCI/90-79, *Naked indicator after \$QUERY*

The charter of the combined task group is understood to be: *Evaluate the processing of naked references in general and the merits of proposals regarding the functionality of saving and restoring the value of the naked indicator. Investigate where in the MUMPS*

standard explicit text needs to be added regarding the effect that certain language elements will have on the naked indicator. As far as saving and restoring the value of the naked indicator is concerned, at least Bundy's and De Moel's proposals need to be considered as well as current implementations. As far as the addition of explicit text to the MUMPS standard is concerned, at least the function \$QUERY and the specification of a naked reference in a READ command need to be addressed.

2 JUSTIFICATION

2.1 Needs

When software makes use of naked references, it is difficult to reference a different global variable, and then revert to the main 'stream' of the program. Such use will invalidate the value of the naked indicator, and probably cause execution errors in later phases of the program.

This proposal introduces a new intrinsic special variable that can be used to save and restore the value of the naked indicator.

2.2 Existing Practice

Currently, one way of getting at the value of the naked indicator is through the special function \$NAME, and then still rather cumbersome. At least one implementation allows a svn to be referenced and set to a value, thus obtaining and redefining the value of the naked indicator.

3 DESCRIPTION

3.1 General Description

This proposal introduces the new intrinsic special variable \$REFERENCE that returns the namevalue of the most recently referenced svn. This svn may also be SET to a new value, thus creating the possibility to redefine the value of the naked indicator without referencing a global variable.

3.2 Annotated Examples of Use

Consider the following piece of MUMPS code:

```
    ...
    DO SAVNAK
    ...
    DO RESTNAK
    ...
    QUIT
    ;
SAVNAK   SET OLD=$REFERENCE QUIT
RESTNAK SET $REFERENCE=OLD QUIT
```

The code at label SAVNAK saves the value of the gvn that was most recently referenced. Note that a reference to a name does not automatically mean that the associated variable exists or has a value. The code at label RESTNAK restores the naked indicator to its previous variable. Note that setting \$REFERENCE does not imply that the global variable that it points to is actually referenced, only that the naked indicator is (re)set.

```
...
SET ^X=1 WRITE !,$REFERENCE
SET ^X(1)=2 WRITE !,$REFERENCE
SET $REFERENCE="" WRITE !,"Naked indicator is undefined."
```

should produce:

```
^X
^X(1)
```

Note that a reference to ^X makes the naked indicator undefined, but does not make \$REFERENCE empty. The final command, SET \$REFERENCE="" makes \$REFERENCE empty and also makes the naked indicator undefined.

3.3 Formalization

In Section I, clause 4.1.3.10, make the following additions:

Add to the table that itemizes the names of the svns:

R[EFERENCE]

Add to the clause that describes the various svns:

\$R[EFERENCE] \$REFERENCE returns the namevalue of the most recently referenced gvn, on which the current value of the naked indicator is based; for the behavior after a reference to the function \$QUERY see 4.1.4.13.

The initial value of \$REFERENCE is the empty string. The value of \$REFERENCE may be set to either the empty string, or to a namevalue. indicating a gvn. A side-effect of setting \$REFERENCE equal to the empty string is that the naked indicator will become undefined. A side-effect of setting \$REFERENCE to a namevalue is that the naked indicator will change as if the indicated gvn had been referenced.

In Section I, clause 5.2.17, add to the list that defines the leftrestricted:

| \$R[EFERENCE] |

4 IMPLEMENTATION IMPACTS

4.1 Impact on Existing User Practices and Investments

The addition of this intrinsic special variable will greatly enhance the possibility to maintain software that makes use of naked references. Its greatest impact is the fact that it offers a simple facility to save and restore the namevalue that caused the current value of the naked indicator to be established. Note: \$REFERENCE returns the full namevalue, not the truncated naked indicator, so that the value of \$REFERENCE can later be used in another reference, without the artificial addition of a 'final' subscript to make syntactically correct code.

4.2 Impact on Existing Vendor Practices and Investments

Minor, many implementers already offer this functionality.

4.3 Techniques and Costs for Compliance Verification

Create a routine containing the following text:

```
later)"      SET X=$DATA(^A(3)),^(3)="data ^A 3 (must be retrieved
              SET V1=$REFERENCE
              WRITE !,"$REFERENCE should be equal to '^A(3)': ",V1
              SET X=$DATA(^A(3,4))
              SET V2=$REFERENCE
              WRITE !,"$REFERENCE should be equal to '^A(3,4)': ",V2
              LOCK ^P(27)
              SET V3=$REFERENCE
              WRITE !,"$REFERENCE should still be equal to '^A(3,4)':
",V3
              SET $REFERENCE=V1
              WRITE !,"Naked reference should work: ",^(3)
              WRITE !
              QUIT
```

4.4 Legal Considerations

None

5 CLOSELY RELATED STANDARDS ACTIVITIES

5.1 Other X11 proposals (Type A or Type B) under consideration

X11/89-27 \$NAME

5.2 Other related standards efforts

None

5.3 Recommendations for co-ordinating liaison

SCI2. Possibility to create standard extrinsic functions to save and restore the naked indicator.

6 ASSOCIATED DOCUMENTS

X11/SCI/90-46 \$REFERENCE, similar proposal by different author, withdrawn

X11/SCI/90-54 \$REFERENCE, similar proposal by different author, remanded to
SCI TG22

X11/SCI/90-59-6C *Naked reference on READ*

X11/SCI/90-79 *Naked indicator after \$QUERY*

X11/89-27 \$NAME, MDC Type A extension

X11/SCI/90-62 \$REFERENCE, older version, remanded to SCI TG22