Date: 30 November 1998
To: J3
From: Van Snyder
Subject: Specifications, syntax and edits for M.23: Access to status error messages
References: 97-159, 98-172 98-173r1 98-208, 98-213

1   Background

Specifications and three possible syntaxes to access status error messages were proposed in paper 98-173r1. Informal discussions suggested the "intrinsic procedure" approach is the preferred approach.

Paper 98-213, proposing the intrinsic procedure approach, was presented and discussed at meeting 147. Several issues were raised but not resolved, and the paper was withdrawn after three unsuccessful revisions. Subsequent e-mail discussion revealed that the intrinsic procedure approach does not support access to error messages produced by user-defined derived-type input/output procedures. The approach of using an ERRMSG= specifier in input/output, allocate and deallocate statements does work for this circumstance. This paper proposes specifications, syntax and edits for using an ERRMSG= specifier in input/output, allocate and deallocate statements to provide access to status messages.

This paper depends on facilities proposed in papers 98-172 *Explicitly typed allocations - Rationale, Specs, Syntax, Edits* and 98-208 *Edits for explicitly typed allocations*.

2   Specifications and Syntax

Define an ERRMSG=*default-char-variable* specifier for use in input/output, allocate and deallocate statements. The *default-char-variable* shall have the following characteristics:

- Type default character,

- Allocatable attribute,

- Rank one array, and

- Deferred length

Specify the same characteristics for the `errmsg` argument of user-defined derived-type input/output procedures as for the *default-char-variable* in the specifier.

3   Edits

Edits refer to 99-007. Page and line numbers are displayed in the margin. Absent other instructions, a page and line number or line number range implies all of the indicated text is to be replaced by immediately following text, while a page and line number followed by + indicates that immediately following text is to be inserted after the indicated line. Remarks for the editor are noted in the margin, or appear between [and] in the text.

■ [, *alloc-opt*] ...)		104:19

R623a *alloc-opt*   **is**   STAT = *stat-variable*
                                   or   ERRMSG = *default-char-variable*

Constraint: The *default-char-variable* shall be a default character allocatable array of rank one   104:34+
with deferred length.
Constraint: No *alloc-opt* specifier shall appear more than once in a given statement.
Constraint: The *stat-variable* shall neither be associated with the *default-char-variable*, nor
depend on its bounds, length, allocation status or value.

[Editor: Change "*stat-variable*" to "*stat-variable*, the bounds of the *default-char-variable*,"]   106:18

[Editor: Change "The *stat-variable* shall not" to "Neither the *stat-variable* nor the *default-*   106:20
char-variable shall"]

[Editor: Change "it" to "they"]   106:21

The ERRMSG= specifier is described in [new section] 9.9.2.   106:41+

R632 *deallocate-stmt*   **is**   DEALLOCATE (*allocate-object-list* [, *alloc-opt*] ...)   109:15

[Editor: Change "The *stat-variable* shall not" to "Neither the *stat-variable* nor the *default-*   109:20
char-variable shall". Change "it" to "they"]

The ERRMSG= specifier is described in [new section] 9.9.2.   109:31+

---

                                  or ERRMSG=*default-char-variable*   173:37+

Constraint: The *default-char-variable* shall be a default character allocatable array of rank one   174:6+
with deferred length.
Constraint: No expression or variable in a given OPEN statement shall be associated with
the *default-char-variable* in the same OPEN statement, or depend on its bounds,
length, value or allocation status.

The IOSTAT=, ERR=, and ERRMSG= specifiers are described in [new section] 9.9.   174:16

---

                                  or ERRMSG=*default-char-variable*   178:9+

Constraint: The *default-char-variable* shall be a default character allocatable array of rank one   178:13+
with deferred length.
Constraint: No expression or variable in a given CLOSE statement shall be associated with
the *default-char-variable* in the same CLOSE statement, or depend on its bounds,
length, value or allocation status.

The IOSTAT=, ERR=, and ERRMSG= specifiers are described in [new section] 9.9.   178:20

---

                                  or ERRMSG=*default-char-variable*   179:16+

Constraint: The *default-char-variable* shall be a default character allocatable array of rank one   179:24+
with deferred length.
Constraint: No expression or variable in a given data transfer statement shall be associated
with the *default-char-variable* in the same data transfer statement, or depend on
its bounds, length, value or allocation status.

I couldn't find any prohibition against an internal file or format being associated with an I/O list item, or a variable or expression in a control information list. Are such prohibited (where)? If not, should they be?	180:15+ *J3 note*

[Editor: Change "IOSTAT= or a SIZE=" to "IOSTAT=, SIZE= or ERRMSG="]   180:16

I couldn't find any prohibition against an internal file or format being associated with an I/O list item, or a variable or expression in a control information list. Are such prohibited (where)? If not, should they be?	*J3 note*

The IOSTAT=, ERR=, EOR=, END=, and ERRMSG= specifiers are described in [new section] 9.9. `180:27+`

[Editor: Insert into the list:] `182:17+`

($3\frac{1}{2}$) If the input/output statement also contains an ERRMSG= specifier, the *default-char-variable* becomes defined as specified in [new section] 9.9.2.

[Editor: Insert into the list:] `182:28+`

($3\frac{1}{2}$) If the input/output statement also contains an ERRMSG= specifier, the *default-char-variable* becomes defined as specified in [new section] 9.9.2.

[Editor: Insert into the list:] `182:39+`

($4\frac{1}{2}$) If the input/output statement also contains an ERRMSG= specifier, the *default-char-variable* becomes defined as specified in [new section] 9.9.2.

`193:33, 45,`
`194:9, 21`

```
CHARACTER (LEN=:), ALLOCATABLE, INTENT(INOUT) :: errmsg(:)
```

If the value true is assigned to the `err` argument, the `errmsg` argument shall be defined as specified for the *default-char-variable* in [new section] 9.9.2. `195:25`

                          or ERRMSG=*default-char-variable* `198:1+`

Constraint: The *default-char-variable* shall be a default character allocatable array of rank one with deferred length. `198:9+`

The IOSTAT=, ERR=, EOR=, END=, and ERRMSG= specifiers are described in [new section] 9.9. `198:13`

                          or ERRMSG=*default-char-variable* `199:9+`

Constraint: The *default-char-variable* shall be a default character allocatable array of rank one with deferred length. `199:10+`

The IOSTAT=, ERR=, and ERRMSG= specifiers are described in [new section] 9.9. `199:17`

                          or ERRMSG=*default-char-variable* `201:6+`

Constraint: The *default-char-variable* shall be a default character allocatable array of rank one with deferred length. `201:38+`

Constraint: No variable or expression in a given INQUIRE statement shall be associated with the *default-char-variable* in the same INQUIRE statement, or depend on its bounds, length, value or allocation status.

The IOSTAT=, ERR=, and ERRMSG= specifiers are described in [new section] 9.9. `201:47`

[Editor: new section] `207:17+`

9.9 Error processing at termination of input/output statements

[Editor: Move 9.5.1.5 here, change its title to **9.9.1 IOSTAT= specifier.**]

9.9.2 ERRMSG= specifier

In addition to input/output statements, this section applies to the ERRMSG=*default-char-variable* specifier in ALLOCATE (6.4.1) and DEALLOCATE (6.4.3) statements, and to the `errmsg` argument of user-defined derived-type input/output procedures (9.5.4.4.3).

If the ERRMSG=*default-char-variable* specifier is present and an error condition occurs during execution of an input/output, ALLOCATE or DEALLOCATE statement, or an end-of-file condition occurs during execution of a WAIT or READ statement, or an end-of-record condition occurs during execution of a WAIT or nonadvancing READ statement:

(*i*) If the *default-char-variable* is not allocated the processor shall allocate it; otherwise the processor shall not change its bounds, length, or allocation status.

(*ii*) The processor shall assign a message explaining the condition to the *default-char-variable*.

If the ERRMSG=*default-char-variable* specifier is present and no error condition occurs during execution of an input/output, ALLOCATE or DEALLOCATE statement, no end-of-file condition occurs during execution of a WAIT or READ statement, and no end-of-record condition occurs during execution of a WAIT or nonadvancing READ statement, the processor shall not change the value, bounds, length, or allocation status of the *default-char-variable*.

[Editor: Move 9.5.1.6 – 9.5.1.8 here, changing their numbers to 9.9.3 – 5, and their titles to "ERR= specifier", "END= specifier" and "EOR= specifier" respectively.]

[Editor: Delete]	279:12-21
[Editor: Delete]	283:27-28
[Editor: Delete]	329:1-10
[Editor: Insert new section]	421:40+

C.6.8 ERRMSG= specifier (9.9.2)

The purpose of the *default-char-variable* in an ERRMSG= specifier is to return a message explaining an error or other unexpected condition. It would be most useful to applications if the processor were to assign a neatly formatted message to the *default-char-variable*. If it is necessary to allocate the *default-char-variable*, it is recommended that it be allocated with the number of elements equal to the number of records of the message, and the length equal to the number of characters in the longest record of the message. It is further recommended that the first element of the *default-char-variable* be assigned a record that contains a brief summary of the error condition. This is especially important in the case that the *default-char-variable* is already allocated with a size of one.