

Subject: Updating complex parts  
 From: Van Snyder  
 Reference: 04-384r1, 05-128, WG5/N1626-J3-015, 05-200r1

## 1 Detailed specification

2 Provide a syntax that allows one to update or reference the real and imaginary parts of a complex  
 3 variable individually without updating or referencing the whole thing. For consistency allow reference  
 4 to the real and imaginary parts of a complex named constant.

## 2 Syntax

6 Allow the real and imaginary parts of a complex variable to be accessed by component-like syntax.  
 7 The “component” names considered by subgroup were RE & IM, REAL & IMAG, and REAL & AIMAG.  
 8 Subgroup chose RE and IM. They are short, and their use is common in the scientific and engineering  
 9 communities. Being different from the intrinsic function names will lead to less confusion, since these  
 10 are not intrinsic function references.

## 11 3 Edits presented at meeting 174

12 Edits refer to 04-007. Page and line numbers are displayed in the margin. Absent other instructions, a  
 13 page and line number or line number range implies all of the indicated text is to be replaced by associated  
 14 text, while a page and line number followed by + (-) indicates that associated text is to be inserted after  
 15 (before) the indicated line. Remarks are noted in the margin, or appear between [ and ] in the text.

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16 [Editor: Delete the last sentence of 2.4.3.1 (“Subobjects of complex ...”) because it’s wrong.] 17:1

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17 [Editor: Within the first paragraph after C621 — the last constraint in 6.2.2 — insert the following as 107:26  
 18 the third sentence (after “An array section is an array.”):]

19 A *complex-part-designator* in which the *designator* is an array is an array section; one in which the  
 20 *designator* is an array element is an array element.

21 [It could alternatively be inserted in the new subclause 6.1.2 $\frac{1}{2}$  **Complex parts** introduced at meeting  
 22 173, but that subclause is within 6.1 Scalars.]

## 23 4 Edits presented at meeting 173

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24 [Editor: Insert “, complex part selectors” after “component selectors”.] 19:4

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25 [Editor: Add a right-hand side for *designator* (R603):] 103:13+

26  $\text{or } \textit{complex-part-designator}$

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27 [Editor: Insert a new subclause before 6.1.3 **Type parameter inquiry**:] 106:2+

### 28 6.1.2 $\frac{1}{2}$ Complex parts

29 A **complex part designator** is used to designate the real or imaginary part of a complex data object,  
 30 independently of the other part.

31 R614 $\frac{1}{2}$  *complex-part-designator* **is** *designator* % RE  
 32 **or** *designator* % IM

33 C615 $\frac{1}{2}$  (R614 $\frac{1}{2}$ ) The *designator* shall be of complex type.

34 If *complex-part-designator* is *designator*%RE it designates the real part of *designator*. If it is *designa-*  
 35 *tor*%IM it designates the imaginary part of *designator*. The type of a *complex-part-designator* is real,  
 36 and its kind and shape are those of the *designator*.

**NOTE 6.6 $\frac{1}{2}$** 

The following are examples of complex part designators:

```
impedance%re      !-- Same value as REAL(impedance)
fft%im            !-- Same value as AIMAG(fft)
x%im = 0.0        !-- Sets the imaginary part of X to zero
```

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|---|--|-----------|
| 1 | [Editor: “component ... substring” ⇒ “subobject”.] | 273:1-2   |
| 2 | [Editor: “component ... substring” ⇒ “subobject”.] | 428:32-33 |
| 3 | [Editor: “Part ... component” ⇒ “subobject”.]      | 434:26-27 |
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