To: J3
From: Larry Meadows
Date: September 19, 2000
Title: Unresolved Issue 265
Kind parameter of enums

Unresolved issue 265, page 60, raises the problem that the kind parameter of a BIND(C) enum cannot be determined until each enumerator is processed, but it may be necessary to process all of the enumerators before the kind parameter can be determined:

```
ENUM BIND(C) ::  MTTYPE
      ENUMERATOR :: I = 1
      ENUMERATOR :: J = I*2
      ENUMERATOR :: K = HUGE(0)
END ENUM MTTYPE
```

The problem is that, in order to evaluate I*2, the kind parameter of I must be known, but it isn't known until the kind parameter of K is known.

C guarantees that any enumeration constant shall be representable as an `int`. Therefore, C is able to process the entire enumerated type, evaluating each enumeration constant using `int`, and then determine the integer type used to implement the enumerated type.

A similar algorithm is possible in Fortran. The implementation should select the integer kind that interoperates with the companion C processor's `int` kind, evaluate the enumerators using that integer kind, and then select the integer kind that interoperates with the corresponding C enumerated type.

Note that this requires that the C_INT type alias be a valid kind parameter for the Fortran processor. We believe we should require this, since otherwise virtually no interoperability would be possible.

Edits:
[60:4] add "is significant" just before the comma (note: this is unrelated but it is a minor error on the same page, so I put it here).
[60:5-26] Delete unresolved issue #265
[58:39+] Add a note
Note 4.xxx
C guarantees that enumeration constants fit in a C int (6.7.2.2 of the C standard). Therefore the Fortran processor can evaluate all enumerator values using the integer type with kind parameter C_INT, and then determine the kind parameter of the integer type that interoperates with the corresponding C enumerated type.
[385:24] Make C_INT a valid kind parameter.
Change "The values of C_INT," to "The value of C_INT shall be a valid value for an integer kind parameter on the processor. The values of"
[58:41-43] Make non-specified enum kinds default integer.
Change "processor dependent" to "that of default integer" and delete the following sentence.