JADE-Computer-Note 4

Topic: Programming conventions

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Standards to JADE-Library programmers

Programs which are to be included into the JADE program library must be understandable to other people to assure compatability. The following recommendations are thought to help in optimizing program coding and program execution.

A. General

- Program language must be IBM-compatible FORTRAN
- Each subprogram should contain a comment header which specifies author and date of last update, and also what it does.
- Programs should be tested with the IBM compiler optimization OPT = 2.
- IMPLICIT INTEGER * 2 (H)
  The letter H shall be used as leading letter for I * 2 variables. Other leading letter should be used according to FORTRAN conventions (bad example: REAL MASS).
- The BLANK COMMON should not be used, and be reserved for the HBOOK histogram package.
- Memory space optimization is more important than execution time optimization (which, however, is also important).
- Frequent operations inside loops should be optimized - some examples:

I		II
X = B(I,1)	. . .	X = B(1,I)
X = A(I+1)	. . .	X = A(1+I)
A(J+1) = A(J+1)+1.	. . .	K = J+1
IF(A(1).LE.0.)GØTØ	.	A(K) = A(K)+1.
X = C * 0.5	. . .	IF(A(1).LT.1.)GØTØ
		X = C/2.

Statements of group I are up to 50% faster than the corresponding statements of group II. The first two statements of group I are equal in speed.

B. IBM - NORD10/50 compatability

Whoever thinks his programs could be used at the NORD on-line computer should keep the following remarks in mind.

- PRINT, NAMELIST, RETURN n statements do not exist in NORD-FORTRAN
- hexadecimal constants (Z000F) do not exist
- in-line functions (EXP, SQRT, etc.) are the same, except for all bit- and byte-handling functions (AND, OR, SHIFT, etc.)
- different type declaration statements and default types of variables:

TYPE	IBM	NORD10	NORD50
I - N	32 bits	16	32
A-H, O-Z	32	32	32
INTEGER*2	16	-	-*)
INTEGER	32	16	32
DOUBLE INTEGER	-	32	32
REAL	32	32	32
REAL*8	64	-	-
DOUBLE PRECISION	64	64	64
LOGICAL*1	8	-	-
LOGICAL	32	16	32 bits

*) implementation promised by NORSK DATA (details later)

1 character = 1 byte corresponds to 8 bits in all machines.

Note that the different word length of type INTEGER causes special troubles: the largest value of I in the NORD10 is 32767. Furthermore

```
DIMENSION A(100), IA(100)
EQUIVALENCE (A(1), IA(1))
```

has different effects on the IBM/NORD50 and NORD10. In the NORD10 the IA-array covers only half of the A-array.