

# NAG Library Routine Document

## F06HDF

**Note:** before using this routine, please read the Users' Note for your implementation to check the interpretation of *bold italicised* terms and other implementation-dependent details.

### 1 Purpose

F06HDF multiplies a complex vector by a scalar, preserving the input vector.

### 2 Specification

```
SUBROUTINE F06HDF (N, ALPHA, X, INCX, Y, INCY)
  INTEGER          N, INCX, INCY
  COMPLEX (KIND=nag_wp) ALPHA, X(*), Y(*)
```

### 3 Description

F06HDF performs the operation

$$y \leftarrow \alpha x$$

where  $x$  and  $y$  are  $n$ -element complex vectors scattered with stride INCX and INCY respectively, and  $\alpha$  is a complex scalar.

### 4 References

None.

### 5 Arguments

- |    |   |               |
|----|---|---------------|
| 1: | N – INTEGER   | <i>Input</i>  |
|    | <i>On entry:</i> $n$ , the number of elements in $x$ and $y$ .  |               |
| 2: | ALPHA – COMPLEX (KIND=nag_wp)   | <i>Input</i>  |
|    | <i>On entry:</i> the scalar $\alpha$ .  |               |
| 3: | X(*) – COMPLEX (KIND=nag_wp) array  | <i>Input</i>  |
|    | <b>Note:</b> the dimension of the array X must be at least $\max(1, 1 + (N - 1) \times  \text{INCX} )$ .        |               |
|    | <i>On entry:</i> the $n$ -element vector $x$ .  |               |
|    | If $\text{INCX} > 0$ , $x_i$ must be stored in $X(1 + (i - 1) \times \text{INCX})$ , for $i = 1, 2, \dots, N$ . |               |
|    | If $\text{INCX} < 0$ , $x_i$ must be stored in $X(1 - (N - i) \times \text{INCX})$ , for $i = 1, 2, \dots, N$ . |               |
|    | Intermediate elements of X are not referenced.  |               |
| 4: | INCX – INTEGER  | <i>Input</i>  |
|    | <i>On entry:</i> the increment in the subscripts of X between successive elements of $x$ .                      |               |
| 5: | Y(*) – COMPLEX (KIND=nag_wp) array  | <i>Output</i> |
|    | <b>Note:</b> the dimension of the array Y must be at least $\max(1, 1 + (N - 1) \times  \text{INCY} )$ .        |               |
|    | <i>On exit:</i> the vector $y$ .  |               |

If  $\text{INCY} > 0$ ,  $y_i$  will be stored in  $Y(1 + (i - 1) \times \text{INCY})$ , for  $i = 1, 2, \dots, N$ .

If  $\text{INCY} < 0$ ,  $y_i$  will be stored in  $Y(1 - (N - i) \times \text{INCY})$ , for  $i = 1, 2, \dots, N$ .

Intermediate elements of  $Y$  are unchanged.

6:  $\text{INCY} - \text{INTEGER}$

*Input*

*On entry:* the increment in the subscripts of  $Y$  between successive elements of  $y$ .

## 6 Error Indicators and Warnings

None.

## 7 Accuracy

Not applicable.

## 8 Parallelism and Performance

F06HDF is not threaded in any implementation.

## 9 Further Comments

None.

## 10 Example

None.

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