

# NAG Fortran Library Routine Document

## F06HTF

**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

F06FRF applies a complex elementary reflection (Householder matrix)  $P$ , as generated by F06HRE, to a given complex vector:

$$\begin{pmatrix} \delta \\ y \end{pmatrix} \leftarrow P \begin{pmatrix} \delta \\ y \end{pmatrix}$$

where  $y$  is an  $n$  element complex vector and  $\delta$  is a complex scalar.

To apply the conjugate transpose matrix  $P^H$ , call F06HTF with  $\bar{\theta}$  in place of  $\theta$ .

### 2 Specification

```
SUBROUTINE F06HTF (N, DELTA, Y, INCY, THETA, Z, INCZ)
  INTEGER          N, INCY, INCZ
  complex*16     DELTA, Y(*), THETA, Z(*)
```

### 3 Description

None.

### 4 References

None.

### 5 Parameters

- |    |  |                     |
|----|--|---------------------|
| 1: | N – INTEGER  | <i>Input</i>        |
|    | <i>On entry:</i> $n$ , the number of elements in $y$ and $z$ .   |                     |
| 2: | DELTA – <b>complex*16</b>  | <i>Input/Output</i> |
|    | <i>On entry:</i> the original scalar $\delta$ .  |                     |
|    | <i>On exit:</i> the transformed scalar $\delta$ .  |                     |
| 3: | Y(*) – <b>complex*16</b> array   | <i>Input/Output</i> |
|    | <i>On entry:</i> the original vector $y$ .   |                     |
|    | <i>On exit:</i> the transformed vector $y$ .   |                     |
| 4: | INCY – INTEGER   | <i>Input</i>        |
|    | <i>On entry:</i> the increment in the subscripts of Y between successive elements of $y$ .   |                     |
| 5: | THETA – <b>complex*16</b>  | <i>Input</i>        |
|    | <i>On entry:</i> the value $\theta$ , as returned by F06HRE. If $\theta = 0$ , $P$ is assumed to be the unit matrix and the transformation is skipped. |                     |
|    | <i>Constraint:</i> if THETA $\leq 0$ , $n = 0$ .   |                     |

- 6:  $Z(*)$  – *complex\*16* array *Input*  
*On entry:* the vector  $z$ , as returned by F06HRF.
- 7: INCZ – INTEGER *Input*  
*On entry:* the increment in the subscripts of  $Z$  between successive elements of  $z$ .

## 6 Error Indicators and Warnings

None.

---