

TGEOREF USER'S GUIDE

There are two ways to operate the GEOREF component test program, TGEOREF: interactively or by using an input file. In interactive mode, enter and convert the coordinates from the keyboard; in file mode TGEOREF reads a user-specified input file, performs the conversions, and writes the input information along with the converted coordinates to a user-specified output file.

SECTION 1 : HOW TO USE TGEOREF IN INTERACTIVE MODE

When TGEOREF runs interactively, set options by selecting choices from a series of menus. Enter other information (i.e. latitude, longitude, grid coordinates) at specified prompts. The different options are as follows:

1.1 COORDINATE FORMAT

1.1.1 DEGREES/MINUTES/SECONDS (DMS)

Use the format “DDD MM SS.SS H” for entry and display of coordinates; 'H' is 'N'-north, 'S'-South, 'E'-east, 'W'-west, as appropriate.

1.1.2 DECIMAL DEGREES (DD)

Use a single real number for entry and display of coordinates.

1.2 LONGITUDE FORMAT

Specifies the format for entry and display of longitude coordinates.

For Degrees/Minutes/Seconds choose either:

1. 0 E to 360 E
2. 180 W to 180 E

For Decimal Degrees choose either:

1. 0 to 360
2. -180 to 180

1.3 DIRECTION

Specify the direction of the conversion. The choices are GRID to GEO (GEOREF coordinates to Geodetic coordinates) or GEO to GRID (Geodetic coordinates to GEOREF coordinates).

1.4 PRECISION

The menu of precision choices will change according to the coordinate format, and the direction of the conversion. The precision option prevents the output of meaningless numbers. Select the highest value from the menu that is lower than the precision of the user's data. This prevents losing any information in the conversion. The menu's that will appear during the execution of TGEOREF are as follows:

| Coordinate Format : DMS | | Direction : Grid to Geodetic | |
|-------------------------|------------|------------------------------|-----------------|
| # of Digits | Precision | Example | Output |
| ===== | | | |
| 4 | 1 minute | DEFG2020 | Nearest minute |
| 6 | .1 minute | DEFG202099 | Nearest second |
| 8 | .01 minute | DEFG20209999 | Nearest 0.1 sec |

| Coordinate format : DD | | Direction : Grid to Geodetic | |
|------------------------|------------|------------------------------|---------------|
| # of Digits | Precision | Example | Output |
| ===== | | | |
| 4 | 1 minute | DEFG2020 | .01 degrees |
| 6 | .1 minute | DEFG202099 | .001 degrees |
| 8 | .01 minute | DEFG20209999 | .0001 degrees |

| Coordinate format : DMS | | Direction : Geodetic to Grid | |
|-------------------------|--|------------------------------|--------------|
| Input Precision | | # of Digits | Example |
| ===== | | | |
| Nearest minute | | 4 digits | DEFG2020 |
| Nearest second | | 6 digits | DEFG202099 |
| Nearest tenth second | | 8 digits | DEFG20209999 |

| Coordinate format : DD | | Direction : Geodetic to Grid | |
|------------------------|--|------------------------------|--------------|
| Input Precision | | # of Digits | Example |
| ===== | | | |
| Nearest .01 degrees | | 4 digits | DEFG2020 |
| Nearest .001 degrees | | 6 digits | DEFG202099 |
| Nearest .0001 degrees | | 8 digits | DEFG20209999 |

1.5 LATITUDE AND LONGITUDE

The format of the latitude and longitude value will depend on the coordinate format and the precision selected by the user. The degrees/minutes/seconds format is DD MM SS.SS H where DD is degrees, MM is the minutes, SS is the seconds, and H is the hemisphere. The inclusion of decimal places or the number of decimal places is dependent on the precision. Enter a latitude from 0 to 90 degrees North or South, and a longitude from either 0 to 360 E or 180 W to 180, depending on the longitude format. In decimal degrees mode enter coordinates as a single real number. Enter latitudes from 0 to 90 for north latitude and 0 to -90 for south latitude. Enter longitudes from 0 to 360 or from -180 to 180.

1.6 GRID COORDINATE

The format of the GEOREF grid coordinate is dependent upon the precision specified by the user. A GEOREF coordinate consists of a one degree quadrangle letter combination and a series of numbers defining the number of minutes, 0.1 minutes, or 0.01 minutes of longitude by which the point lies eastward of the western meridian and the number of minutes, 0.1 minutes, or 0.01 minutes of latitude by which the point lies northward of the southern parallel of the one degree quadrangle. Some examples are:

| | |
|--------------|--|
| MKPG1204 | (Defining a location to the nearest minute) |
| MKPG120040 | (Defining a location to the nearest 0.1 minute) |
| MKPG12000400 | (Defining a location to the nearest 0.01 minute) |

SECTION 2 : HOW TO USE TGEOREF IN FILE MODE

In file mode TGEOREF asks only for the names of the input and output files. Input files must have the extension “.crd”. Output files are given the extension “.out”. When TGEOREF asks for the names of the input and output files do not give the extension; type the part of the file name before the dot. File mode uses the same logic as interactive mode, but information is retrieved using keywords from the input file. Place comments anywhere within the file. A semicolon represents a delimiter specifying that anything after the semicolon and including the semicolon is to be ignored. A typical line will look like this:

```
KEYWORD      PARAMETER      ; COMMENT
```

An example input file can be found in Appendix A and an example output file can be found in Appendix B.

2.1 COORDINATE FORMAT

Use the keyword `COORD_FMT` followed by either `DMS` (degrees/minutes/seconds) or `DD` (decimal degrees).

2.2 LONGITUDE FORMAT

Use the keyword `LON_FMT` followed by either `360` for `0 E` to `360 E` (`0` to `360`) or `180` for `180 W` to `180 E` (`-180` to `180`).

2.3 DIRECTION

Use the keyword `GRID_DIR` followed by either `GEO-GRID` (Geodetic to GOREF) or `GRID-GEO` (GOREF to Geodetic).

2.4 PRECISION

As in interactive mode, the precisions that are acceptable change according to the coordinate format, and the direction of the conversion. The syntax for each situation is as follows:

Coordinate format : DMS or DD Direction : Grid to Geodetic

```
=====
ACCURACY      1_MINUTE
ACCURACY      .1_MINUTE
ACCURACY      .01_MINUTE
```

Coordinate format : DMS Direction : Geodetic to Grid

```
=====
ACCURACY      1_MINUTE
ACCURACY      1_SECOND
ACCURACY      .1_SECOND
```

Coordinate format : DD Direction : Geodetic to Grid

```
=====
ACCURACY      .01_DEGREES
ACCURACY      .001_DEGREES
ACCURACY      .0001_DEGREES
```

2.5 LATITUDE AND LONGITUDE

The rules that apply to latitude and longitude coordinates that are entered interactively also apply to latitude and longitude coordinates that are entered into an input file. Precede the latitude by the keyword `LATITUDE` and the longitude by the keyword `LONGITUDE`. An example is :

```
LATITUDE 20 34 22.48 N
LONGITUDE 45 16 39.52 E
```

2.8 GRID COORDINATE

The rules that apply to grid coordinates that are entered interactively also apply to grid coordinates that are entered into an input file. The grid coordinate must be preceded by the keyword `COORDINATE`. An example is :

```
COORDINATE MKPG120040
```

2.9 CONVERT

The keyword `CONVERT` must be entered before any conversion is to take place. The keyword should be placed on a line by itself. The keyword `CONVERT` needs to follow each coordinate that is to be converted. If a `GEOREF` to Geodetic conversion is taking place, the word `CONVERT` should be placed on the line following the `GEOREF` coordinate. If a Geodetic to `GEOREF` conversion is taking place, the word `CONVERT` should be placed on the line following the latitude or longitude. Two examples are:

```
COORDINATE MKPG120040
CONVERT
```

```
LATITUDE 20 34 22.48 N
LONGITUDE 45 16 39.52 E
CONVERT
```

APPENDIX A : SAMPLE INPUT FILES

```
COORD_FMT      DMS      ; SET COORDINATE INPUT TO DMS OR DD
LON_FMT        180      ; LON FORMAT 0-360 E OR 0-180 E/W

GRID_DIR       GEO-GRID  ; CHOOSE DIRECTION
ACCURACY       1_MINUTE  ; NO SECONDS PLACE

LATITUDE 51 04 N
LONGITUDE 001 48 W      ; MKPG1204
CONVERT

GRID_DIR       GEO-GRID  ; CHOOSE DIRECTION
ACCURACY       1_SECOND  ; NO DECIMAL PLACES, ONLY WHOLE NUMBERS

LATITUDE 51 04 00 N
LONGITUDE 001 48 00 W   ; MKPG120040
CONVERT
```

APPENDIX B : SAMPLE OUTPUT FILES

```
;      COORD_FMT      DMS      ; SET COORDINATE INPUT TO DMS OR DD
;      LON_FMT        180      ; LON FORMAT 0-360 E OR 0-180 E/W
;
;      GRID_DIR        GEO-GRID ; CHOOSE DIRECTION
;      ACCURACY        1_MINUTE ; NO SECONDS PLACE
;
```

```
=====
Latitude      Longitude      Grid Coordinate
=====
51 04 N       001 48 W       MKPG1204
```

```
;      GRID_DIR        GEO-GRID ; CHOOSE DIRECTION
;      ACCURACY        1_SECOND ; NO DECIMAL PLACES, ONLY WHOLE NUMBERS
```

```
=====
Latitude      Longitude      Grid Coordinate
=====
51 04 00 N    001 48 00 W    MKPG120040
```