

HP48G/G+/GX *QUICKCLOSE* SPIRAL PROGRAM

April 2001

This simple program performs the necessary computations to set out and compute points on a spiral segment (transition curve). The clothoid spiral is adopted. The program ;

- a. Sets out points relative to a clothoid spiral segment, given Chainage and Offset from the spiral segment
- b. Computes chainage and offsets relative to a spiral segment, given coordinates of a point.

1.0 Installation

Use kermit or other connectivity software to send the files;

Spiral.lib (the Spiral program library)

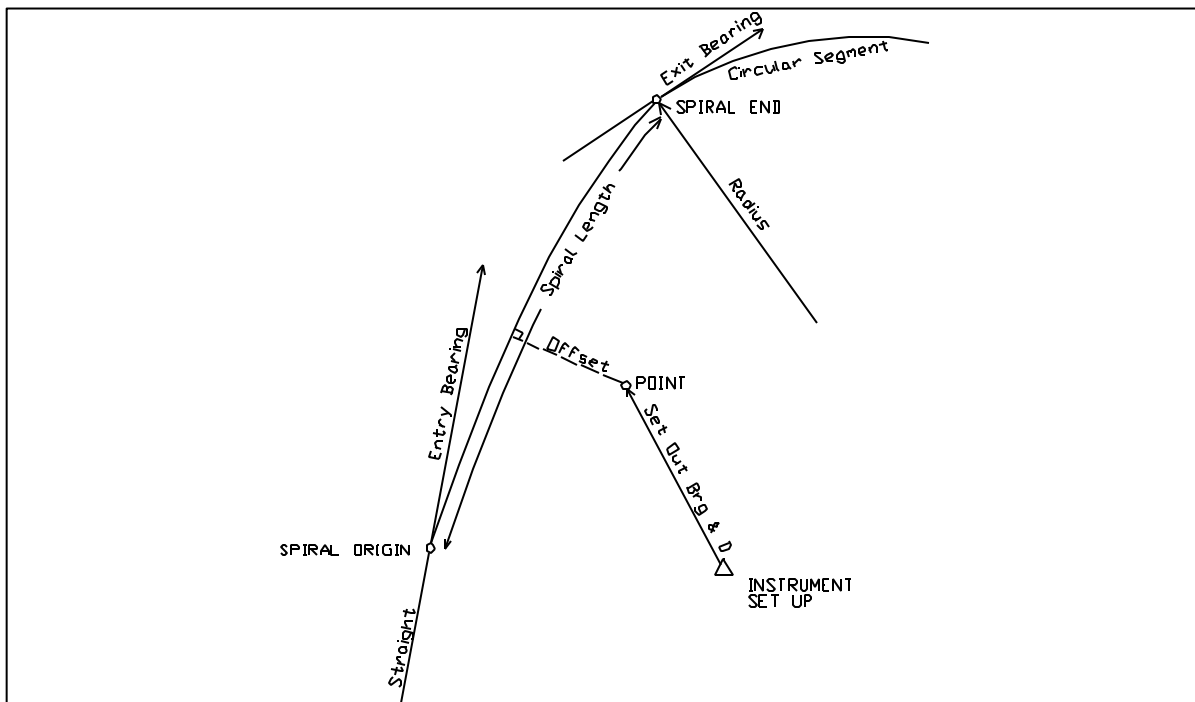
Spins (the installation file)

to a suitable directory on the HP48G/G+/GX

Press **SPINS** to install the library. The calculator will turn itself off.

Press **&** to turn the calculator back on.

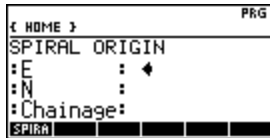
Press **J** to access the program directory



A typical example of a transition spiral

2.0 Running the Program

Press **SPIRA** to run the Spiral program, the following screen will appear;

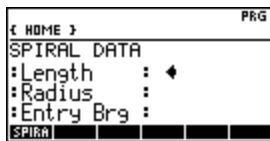


:E : Type in the Easting of the Spiral Origin (start of the spiral).
Press the **Q** key

:N : Type in the Northing of the Spiral Origin (start of the spiral).
Press the **Q** key

:Chainage : Type in the Chainage of the Spiral Origin (start of the spiral).
Press the **!** key

The following screen will appear;

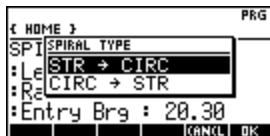


:Length : Type in the length of the spiral segment (transition length).
Press the **Q** key

:Radius : Type in the radius of the circular arc that adjoins the spiral .
Press the **Q** key

:Entry Brg : Type in the tangent bearing (in Deg,min,sec) at the Spiral Origin.
Press the **!** key

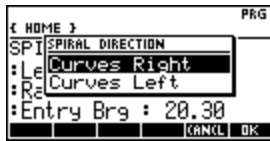
The following screen will appear;



If the spiral segment connects a Straight to a circular arc, select **STR -> CIRC** and press **OK** or **!**

If the spiral segment connects a circular arc to a straight, press **Q** to select **CIRC -> STR** and press **OK** or **!**

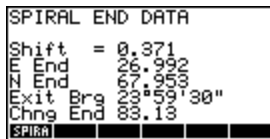
The following screen will appear;



If the spiral segment curves to the right (in the direction of increasing chainage), select **Curves Right** and press **OK** or **!**

If the spiral segment curves to the left (in the direction of increasing chainage), press **Q** to select **Curves Left** and press **OK** or **!**

Computed data for the spiral segment will be displayed as follows;



Shift = The offset between the straight segment and the circular arc
E End The Easting of the end of the spiral segment
N End The Northing of the end of the spiral segment
Exit Brg The tangent bearing at the end of the spiral segment
Chng End The chainage at the end of the spiral segment

Press any key to continue....

The following SELECT OPTION screen will appear;



To set out points on or relative to the spiral segment select **Spiral Set Out** and press **OK** or **!**

Go to section 3.0 below for further instructions

To compute the chainage and offset of points relative to the spiral segment press **Q** to select **Compute Offsets** and press **OK** or **!**

Go to section 4.0 for further instructions

To quit the program press **Q** to select **Quit** and press **OK** or **!**

3.0 Setting out a spiral segment and offsets

After entering the necessary data (above) and the **Spiral Set Out** option is selected the following screen will appear;

```
{ HOME } PRG
SET UP COORDS
:E : 
:N : 
LOPR SPIRA
```

:E : Type in the Easting of the Instrument station.
Press the \square key

:N : Type in the Northing of the Instrument station.
Press the ! key

For each point to set out the following prompt screen will appear. To exit the program press ! at a blank prompt screen.

```
{ HOME } PRG
SPIRAL SET OUT
:Chainage: 
:Offset : 
SPIRA
```

:Chainage : Type in the chainage of the point relative to the spiral segment .
Press the \square key

:Offset : Type in the offset* of the point relative to the spiral segment.
Press the ! key

*Note:

If the offset is to the right of the curve with increasing chainage it will be positive

If the offset is to the **left** of the curve enter as a **negative** distance (-)

If the offset is 0 (i.e. it lies on the centreline) enter 0 for the distance

The solution for each point will be displayed as follows ;

```
Chainage 83.13
Offset 10
at E 36.128
N 63.887
Brg 23°48'41"
Dist 15.179
SPIRA
```

Chainage the chainage entered

Offset the offset entered (negative if left of the line)

At E the Easting of point to be set out

N the Northing of the point to be set out

Brg The bearing from the instrument station to the point

Dist The distance from the instrument station to the point

Press any key to continue.....

4.0 Computing the chainage and offset of a point to a spiral

After entering the necessary data (above) and the **Compute Offsets** option is selected, for each point to compute the following prompt screen will appear. To exit the program press ! at a blank prompt screen.



```

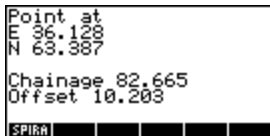
{ HOME }          PRG
Compute Chainage
& Offset at
:E : 
:N : 
SPIRA

```

:E : Type in the Easting of the point.
Press the **Q** key

:N : Type in the Northing of the point.
Press the **!** key

The solution for each point will be displayed as follows ;



```

Point at
E 36.128
N 63.387

Chainage 82.665
Offset 10.203
SPIRA

```

E	The Easting entered for the point
N	The Northing entered for the point
Chainage	The chainage computed to the point
Offset	The offset computed to the point from the spiral centreline

***Note:**

If the offset is to the right of the curve with increasing chainage it will be positive

If the offset is to the **left** of the curve it will be **negative** (-)

If the offset is 0 it lies on the centreline

Press any key to continue further computations.....