



DisDirToXYplus: program&interface

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Abstract

DisDir2XY converts geographic vector coordinates into other units and azimuth projections.

- Input is manually or is read from files of vector data layers, messages, (log) files.
 - Output of results are completed with an additional trigger file for waiting programs.
 - Large geo data sets (feature files, tables and properties file) can be converted into other projections.
 - Unknown positions can be estimated from two direction values of two or more widely spread observation points and subsequent calculation of a list of azimuthal points up to a distance of 20,000 km.
- Location specific values are converted separately to WGS84 values. Both lines can be shown in a map viewer (e.g. VBAMap). The intersection point of both lines might indicate the searched position.

Data types

- **Dutch Grid (meter):** a popular unit for detailed Dutch map products. Its usage is valid inside a limited zone.
Below latitude and longitude values of a polygon mark out this zone (as WGS84):
 $x(1) = 2.93$ $x(2) = 7.57$ $x(3) = 7.43$ $x(4) = 3.10$ $x(5) = 2.93$
 $y(1) = 53.62$ $y(2) = 53.62$ $y(3) = 50.57$ $y(4) = 50.57$ $y(5) = 53.62$
 Due to its stratified property Dutch Grid data use own calculation methods; data inside "NL" mostly have the best precision. References outside the Dutch grid zone use an own calculation method.
- **Distance & Direction** (km and degrees as compass direction from the reference towards an object). Values are calculated by the method of the great-circle distance of points. When using Dutch Grid coordinates a simple goniometric method is used.
- **Azi x,y** (km): azimuth data are related with Distance and Direction of individual points. Azimuthal maps have a named reference as the center point (coordinates= 0,0 km). Azimuthal maps give a clear insight of distance and direction of word widely spread geographic objects. 'Far away' reference points might give strange azimuthal world maps and enormous shifts of continents.
- **WGS84**(as decimal degrees or as degrees-minutes-seconds). Conversion of azimuth data into WGS 84 uses an approach with a searching and iterations in a specific(!) look up table that is based on the WGS84 coordinates of the named reference point. Those results have a limited accuracy.
- **QTH locator:** code of 6 characters as location indication, commonly used by radio amateurs for worldwide locations exchange. It is derived from truncated WGS84 coordinates and has an accuracy of about 4km.
- **Data Type Out: Directions as WGS84 Lines**
 - This needs some explication: unknown position in the world can be derived from two direction values measured on spread locations having defined positions.
 - From both values the respective series of azimuth points are calculated as a route over a distance of 20,000 km.
 - All data are converted into WGS84 using iteration techniques of location specific tables.
 - Results of both lines are stored as a standard map layer for lines enabling quick inspection by a map viewer.
The intersection point of both lines might indicate the searched position on the world map. See example in Appendix (= Bijlage).

Data Input

1. **'Manually'**: Figure 1 shows for each data type how and what unit data has to be entered.
2. **'File: Last Log Data'**. After activation of the timer the data file is read periodically. There are two options of data reading:
 - Structured data only: all data lines have the same consistent format like the input of the Manually mode. This type of data mostly is produced by a program as a 'growing' file by automatic updates.
 - Structured data behind a text marker inside unstructured text (e.g. in messages loggings, text, bulk email). The text of the text marker is set in the DisDirToXY.ini file. Remark: even spaces are valid text! DisDir2XY.exe searches for valid data and converts and selects finally the last found values to be 'output'.

Example (with space): 'TEXT_MARKER=position is '. The program interprets input data immediately behind the text 'position is '

When 'TEXT_MARKER=' is not set (e.g. as '#TEXT_MARKER=position is ') then only well formatted data lines are expected.
3. **'GeoDataFile'**. A map built with vector data contains a mass of coordinates mostly in units as WGS84 or (for the Netherlands) as Dutch grid. Azimuth maps are popular for radio amateurs (e.g. distance & direction finding). Complete ASCII geo data sets can be converted into location-specific azimuthal map projections. Note: "Conversions of azimuthal data into other units use iterations, is working slow and has a limited accuracy". Input and output of data is guided by a file dialog. Remark: complete vector geo data sets consist of a three files: indexed vector data (points: *.pnt or lines: *.lin or polygons: *.pol), its properties file (*.prp) managing how vector should be drawn on the map and the table file (*.tab) contains text info of the vectors. Geo data sets are described in the help of the map viewer "VBAMap". Libraries with paths of up to 26 map layers (*.map) can be converted by a click and generates a new library with path info of the new products. These libraries are very useful for a fast generation of maps by VBAMap.

Data Output

- Both 'Manually' and 'Last Log Data' eventually can send calculation results to the file 'STANDARD_FILE_OUT'.
- In case of 'Last Log Data' also a message file is created named 'DisDir2XY.msg' with the actual time code that can be used as a trigger of third programs for automatic processing.
- For exceptional applications an option is added to swap Longitude and Latitude data (WGS84).
- 'Notification' checkbox: it allows warning/messages during calculations. Avoid that at processing of data series.

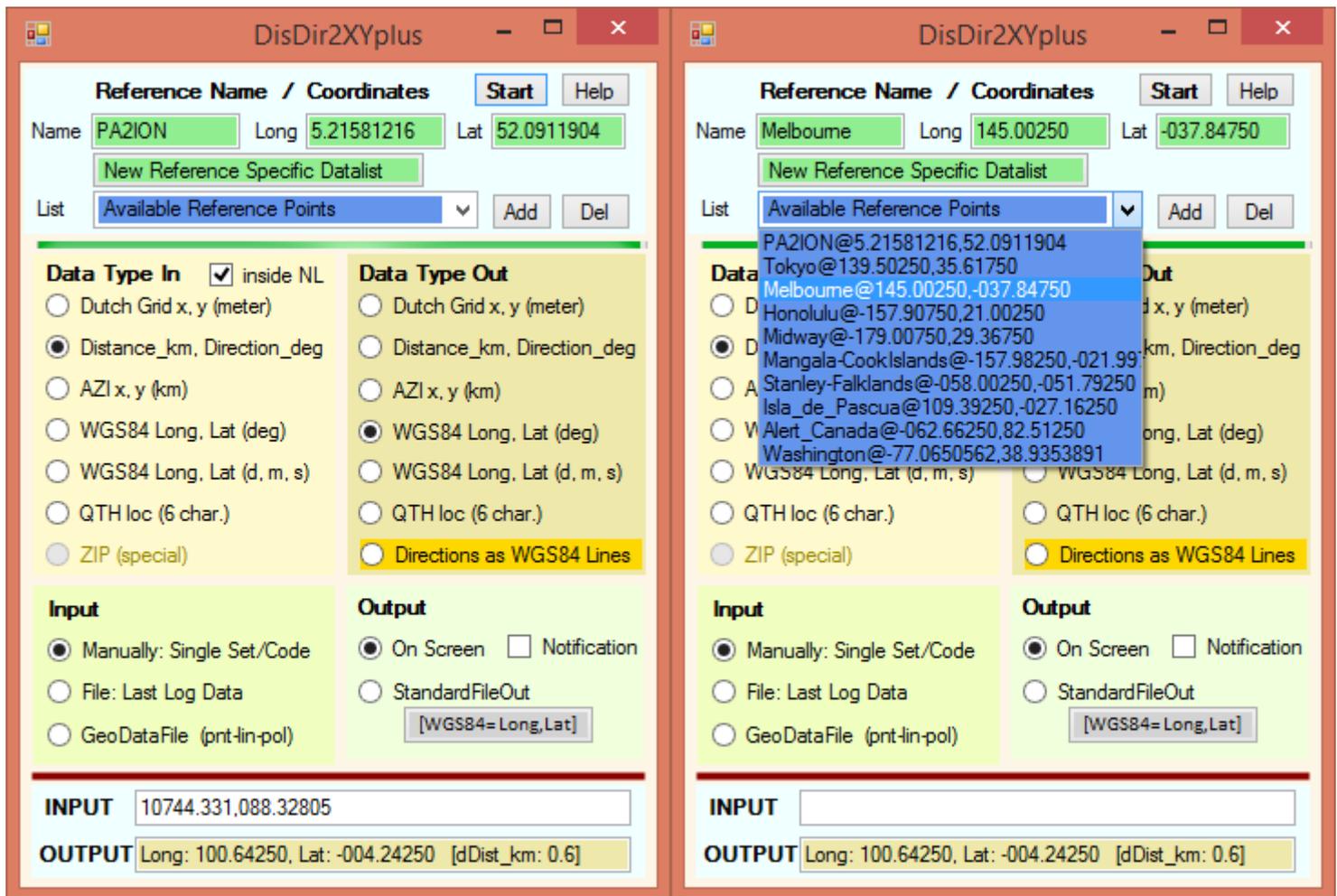


Fig. 1 & 2: "Screen dumps of the program window"

Appendix (examples)

DisDir2XY.ini -sample-

#USER DATA : The program uses Call (label and coordinates data for calculations (WGS84)

#USER DATA

```
ComputerName=PA2ION4DT
HOME_CALL=PA2ION
HOME_X_DEG=5.21581216
HOME_Y_DEG=52.0911904
```

#Example D:/DisDirOutput.txt is the standard output file for mode (b)

```
STANDARD_FILE_OUT=D:\DisDirOutput.pnt
```

#FOR DATA FINDING IN RAW TEXT

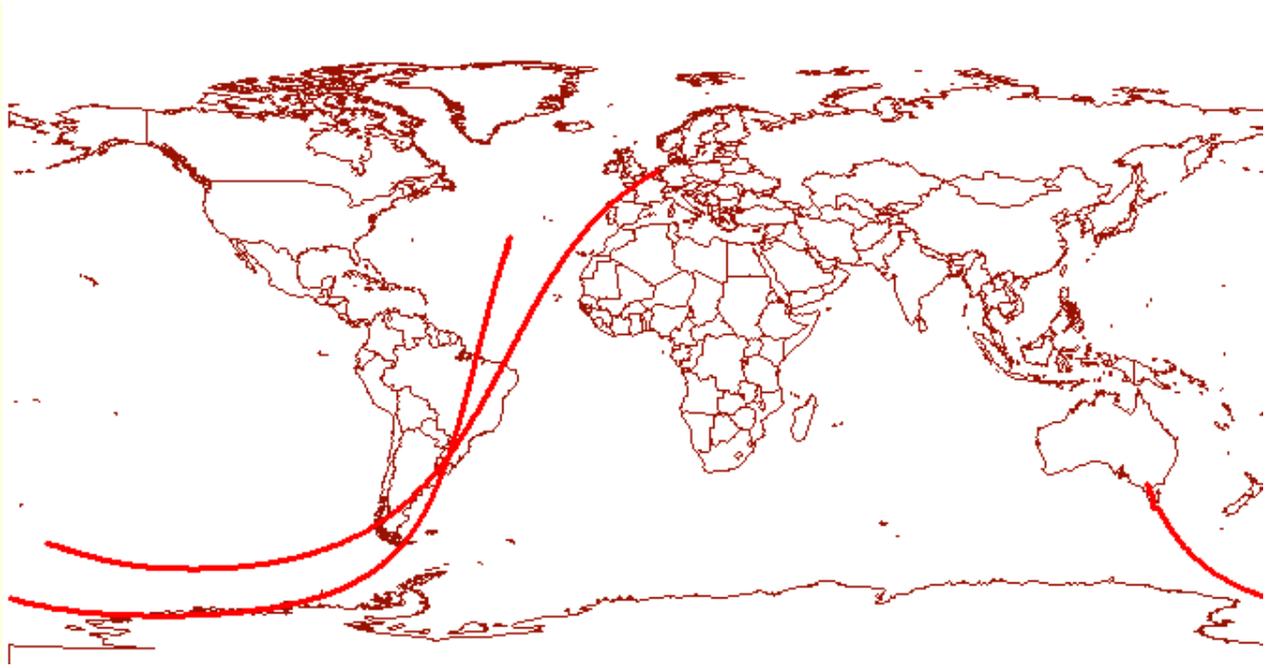
#TEXT_MARKER=QTH is (#not active)

TEXT_MARKER=QTH: (text marker is active – received QTH code comes immediately behind `:')

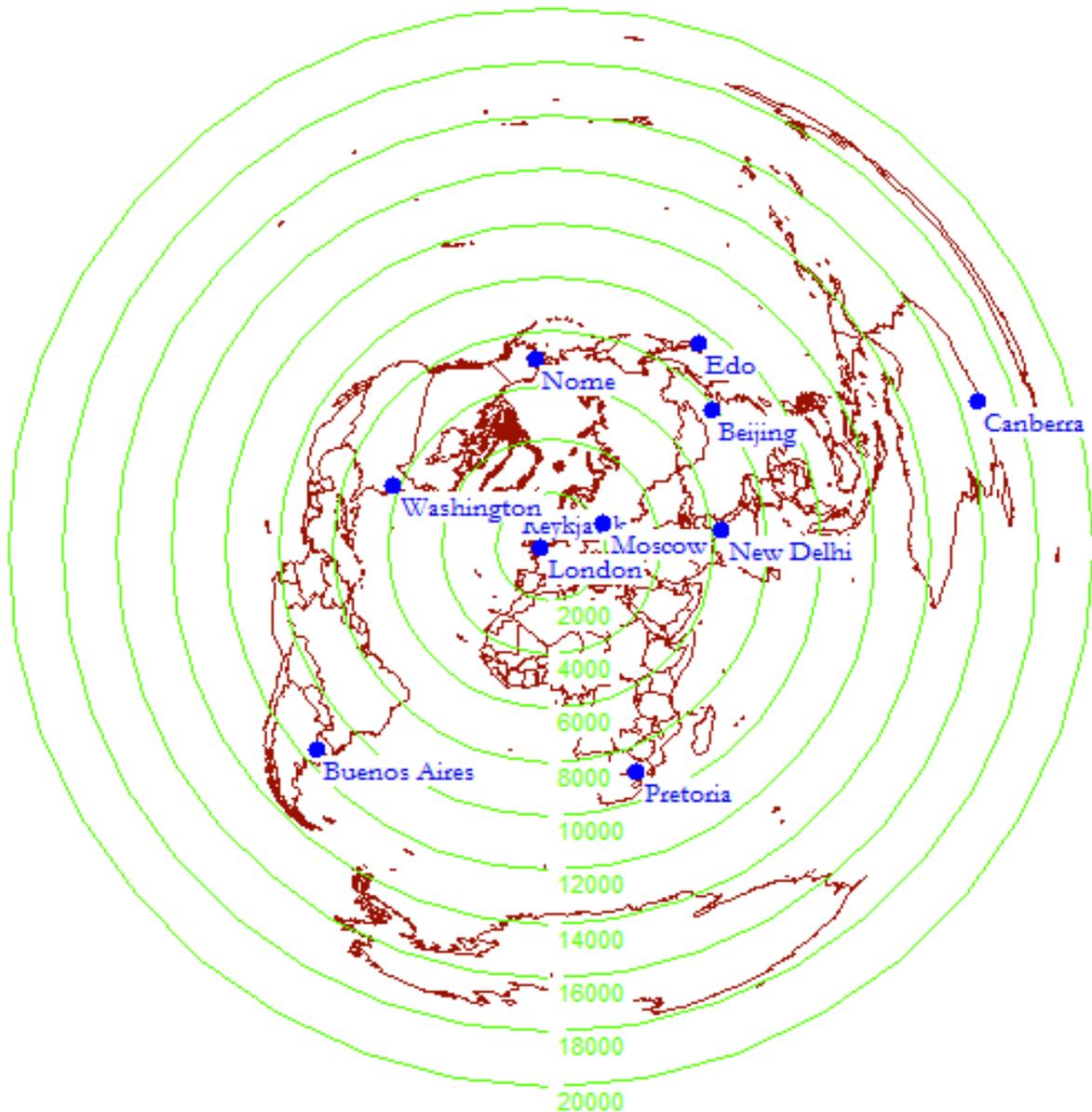
#CREATE LIST of available REFERENCE POINTS

#Examples of (free) preset ADDITIONAL REFERENCES formatted as: [Name@DecimalLongitude,DecimalLatitude](#)

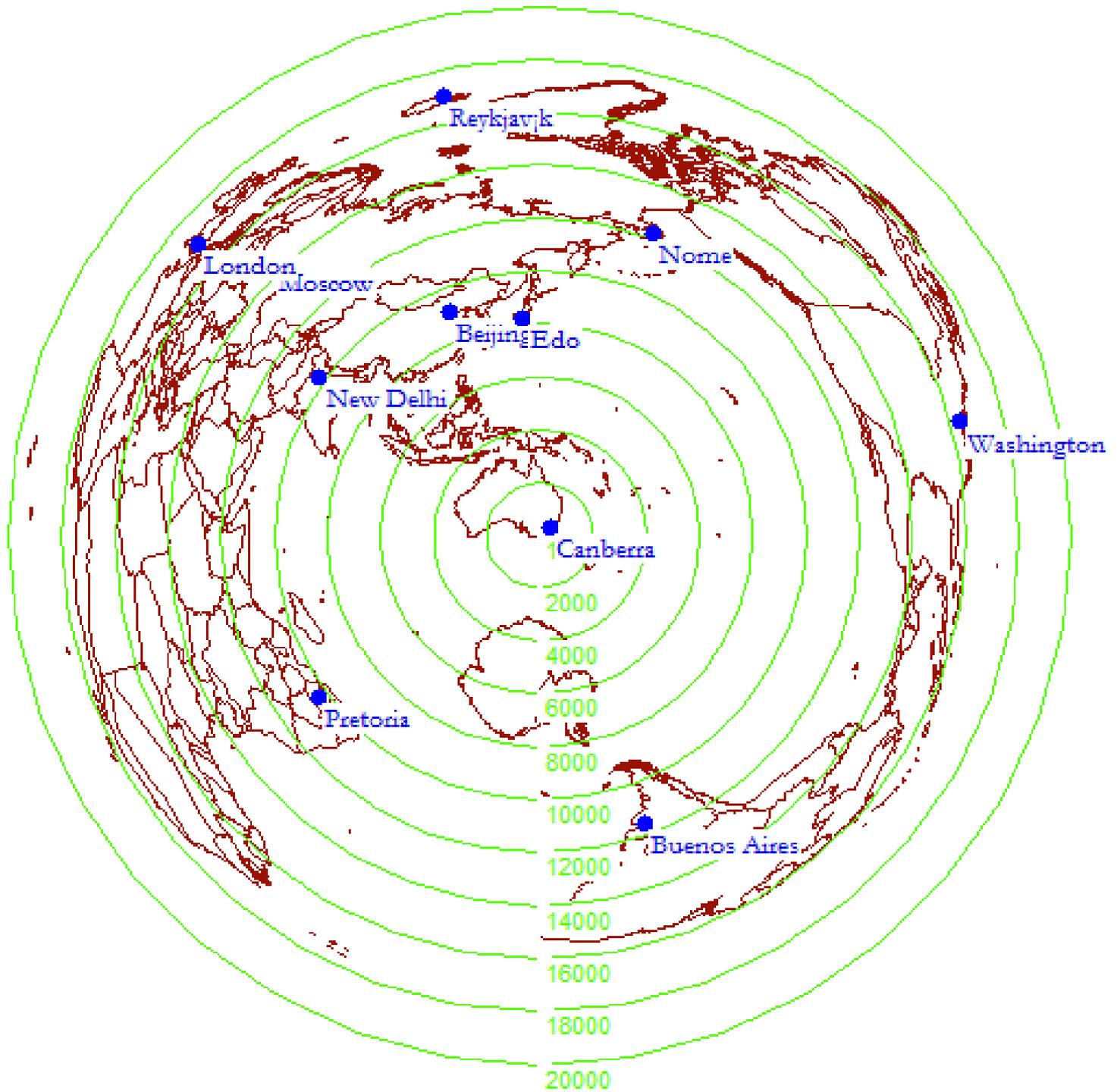
```
ADDRF=Tokyo@139.50250,35.61750
ADDRF=Melbourne@145.00250,-037.84750
ADDRF=Mangala-CookIslands@-157.98250,-021.99750
ADDRF=Stanley-Falklands@-058.00250,-051.79250
ADDRF=Isla_de_Pascua@109.39250,-027.16250
ADDRF=Washington@-77.0650562,38.9353891
ENDofDATA
```



WGS84 map: "Position Finding" using directions from Zeist-Netherlands and Melbourne-Australia



Azimuthal Map I: map center 'Radio Shack of PA2ION' in Zeist - Netherlands ;)



Azimuthal Map II: map center 'Melbourne'