



Direct Conversion of [Y, X] System WG 31° values to [Y, X] System Lo 31° values (RSA)



## **Transform between Clark 1880 (Modified) and WGS 84 Ellipsoids (South Africa)**

- This programme provides for rapid and accurate transformations between the Cape Datum (Clarke 1880 Modified Ellipsoid) (either an RSA "Lo" System, or a UTM Zone System) and the Hartebeesthoek94 Datum (WGS 84 Ellipsoid) (either an RSA "WG" System, or a UTM Zone System) within South Africa.
- Two control files are provided that cover the entire country and which contain approximately 38,000 common Control Points.
- To carry out a transformation, it is only necessary to have co-ordinate, or Geographical [Lat, Long], data related to one of the two Ellipsoids, and lying within the geographical boundaries of South Africa. These data may be contained in a SURPAC Co-ordinate file, an ASCII Co-ordinate file, an ASCII [Lat, Long] file or be written data that are to be entered manually.
- The transformation carried out is by using either a Weighted Helmert transformation, or a Standard (non-weighted) Helmert transformation, with a User determined number of common control Points.
- This programme is designed to satisfy the requirements of Land Surveyors, Mine Surveyors and Engineering Surveyors requiring high accuracy transformations (< 0.10m) for existing data and for GPS derived data. Because of the large number of common control Points (38,000) the transformations are extremely localized and provide the highest accuracy of transformation possible between the two Ellipsoids.
- Tests have shown that typical Standard Deviations resulting from transformations vary between

0.01m and 0.07m. Accuracies in high density urban areas tend to be higher, due to the larger number of common Points in these areas. This programme should not, therefore, be confused with other programmes that offer only approximate (0.50m – 1.50m) transformations for the purpose of small scale mapping, or non-survey related activities.

- Due to the nature of the re-adjustment of the Hartebeesthoek94 co-ordinates using a transformation based on a table of adjustments, or parameters, for a given area cannot provide the same level of accuracy as that of a Weighted Helmert transformation that uses the 4 or 5 closest common Control Points lying around to the Point being transformed.
- The User selects settings from a number of offered options, namely :-
  - The type of Weighting required (None, Inverse Distance or Inverse Distance Squared)
  - The Search Limit to be used when the programme is requested to search for the nearest group of Stations to the current point. This can range from 5Km to 50Km.
  - The Control Points to use. The User selects the number of the nearest common control Points to be used for each Point to be transformed. This number of selected control Points can vary between 2 and 20.
- Once the “Source File” has been selected, the programme will search for the existence of any associated CAD files such as General Plans, Working Plans, Sectional Title Sheets and CAD Plot files, that may also need to be transformed. If required, any associated CAD file will be transformed, using the same Control files and Options as set for the Co-ordinate file.
- Finally, the programme provides the facility of transforming any other related files such as Tacheometric files, Contour Files, DTM files and Centre Line files. These files, if required, will be transformed using the same Control files and Options as set for the Co-ordinate file.