

# Model Maker Systems



Model Maker is a digital terrain modeling program and the most advanced in the Model Maker Systems software suite. It started off with the purpose of merely reducing tachometric survey data to x, y and z co-ordinates and today we are proud to present the most advanced functions available in terrain modeling. The program consists of 20 modules, which are available in four different versions of the program. The versions are determined by the number of survey points that each can model. This modular design gives users access to only those features required for their application and thereby the cost of the software can be reduced greatly. Provision is made to input data manually using

any survey method, importing data from electronic data recorders or GPS systems and from various fixed and free format ASCII files. Data can also be captured from existing drawings using the built-in digitizing option. In addition, a facility exists to survey new data or to use an existing model to do real-time setting out work on site by connecting a computer to an electronic survey instrument in the field. Model Maker also includes a full and comprehensive integrated CAD link between the survey data and all the basic and advanced drawing functions. This enables the surveyor to create detail drawings efficiently on screen with his survey active in the background. In addition to the line styles available the user may also create new line styles and symbols to be used on drawings. Survey observations are automatically reduced to Y, X, Z co-ordinates with retention of the original observation data. Station co-ordinates may be extracted from a trig file or typed in manually during the reduction. A double coding system is available whereby the user may identify specific detail. Two six-character alpha-numeric codes per observation are available without any restriction of the meaning of specific codes. The model is created using a fast automatic triangulation routine with or without restrictions. After the model is created the user still has full control over the various functions provided for editing the model graphically. Once the model is created various calculations may be done, e.g. four methods of calculating volumes, extracting long or cross sections, slope and watershed analyses, three-dimensional viewing, area (plan and surface) and perimeter calculations, automatic toe point generation for platforms, mine planning, rehabilitation (landscaping) of excavations and stockpiles, 3D-masshaul planning, power line tinsplating and earth dam design. Output of results may be printed or saved in a file and drawings may be plotted directly to any HPGL-compatible plotter, plot file or various CAD data exchange ASCII formats. Explore the modules available for Model Maker. Download an evaluation copy of Model Maker. Update your software to the latest version!

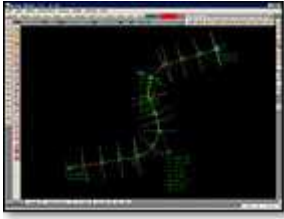
## Model Maker Modules

### **Module 1 - BASIC DATA INPUT AND MODELLING**

This module is used to manipulate data from various sources by automatically creating a triangular model. The user can use break lines to define changes in slope and direction which will be accounted for in the triangulation process. Data can be edited graphically or in text mode. The user has full control over the triangulation with functions for editing the triangulated model after the automatic triangulation.

### **Module 2 - GRAPHICAL OUTPUT**

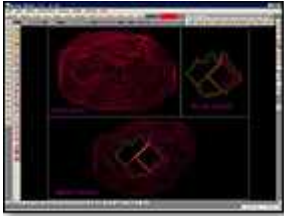
This module is required for any graphical output. The output is determined by using an extensive range of user-definable plotting parameters and the graphical setting of plotting windows covering the total project area. Contours, survey point information, co-ordinate grids and CAD data can be plotted. Plotting can be done directly to an on-line plotter or various ASCII file formats e.g. DXF.



### **Module 3 - SINGLE MODEL VOLUMES, ANALYSIS AND EXTRACTION OF SECTIONS**

When dealing with stockpiles or quarries this module can be used to calculate the earthworks volumes using contours, triangles or cross-sectional areas. The analysis function calculates the sloped surface area, as well as plan area and a slope, height and valley analysis. Long-section or cross-section data can be extracted along a horizontal alignment which can be defined on the

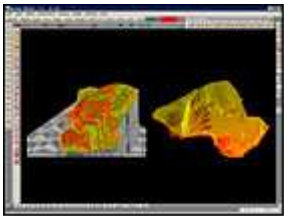
graphic screen or can be captured from CAD entities.



### **Module 4 - TOEPOINT AND MULTIPLE MODEL EARTHWORKS CALCULATION**

Model Maker can be used to model two (up to 21 surfaces) different excavation models. Where the second model is a terrace that must meet the ground model at specified batter slopes, MODEL MAKER will automatically determine these toe points on the ground. The terrace level for balanced earthworks can be determined, taking into account a bulking factor and the batter

slopes. Once the two models have been created, the earthworks volume can be calculated using cross-sections or a more accurate grid.



### **Module 5 - PERSPECTIVE (3D) VIEWS**

Use this module to view the active model from any side or vertical angle in a wire-frame grid or solid fill format. Contours at a user-specified interval can be displayed and the full view can be converted to the CAD environment.



### **Module 6 - COMPUTER AIDED DRAFTING (CAD)**

This module is a comprehensive CAD module with all the basic drawing functions intelligently linked to the DTM data to create detailed survey maps. A drawing can consist of any number of drawing elements, e.g. lines, circles, text, dimensions, hatching, etc. on different layers with a variety of pen, line and font types.



### **Module 7 - DRAW LONG OR CROSS SECTIONS**

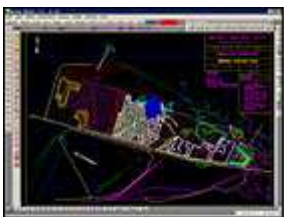
Ground cross-section data extracted using module 3 can be loaded and plotted into the CAD module. The user can specify a horizontal and vertical scale, the paper size and a layer name.

### **Module 8 - HORIZONTAL ALIGNMENT SETTING OUT**

A horizontal alignment can be defined, giving the following data for each point of intersection

(PI):      Name    Y & Z co-ordinate      Curve radius      Transition lengths starting and ending the curve.

This module can now be used to obtain all the curve information - BC, EC peg distance, curve length, as setting out data - distance and direction - from specified set-up stations.

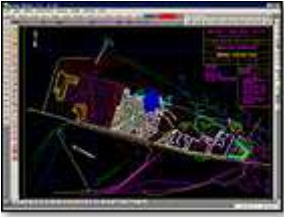


### **Module 9 - OPENCAST MINE PLANNING**

In initial planning for an opencast mine operation this module can be used to calculate volumes between different

Material layers or strata. Borehole data is used to create up to 13 models defining the different strata. The mining areas

(Strips) can be defined as geographical areas and volumes or average depths can be calculated between different strata within each strip area.



### **Module 10 - GEOGRAPHICAL AREAS**

This module is used to define the geographical areas within which opencast mining must be done. Any plan area can be defined. Each area is then numbered and its area and boundary perimeter is calculated.

### **Module 11 - GEOMETRIC ALIGNMENT STRINGS**

A geometric alignment string may be seen as a 3D poly-(CAD)-line where each endpoint/node on the line has an elevation. This may be viewed and manipulated in plan or long-section format. Strings may be used in various design applications, e.g. slope tracking and clashing services.

### **Module 12 - LANDSCAPING**

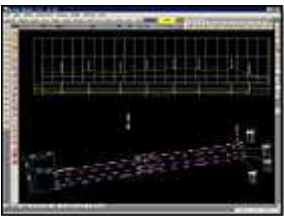
Landscaping of new areas or the rehabilitation of old mine dumps can be done in accordance with slope parameters. An existing model will automatically be updated to the slope parameters to give a balanced (cut/fill) earthworks model. Geometric alignment strings can be used to define restrictions on the movement of material. Material to be imported from or exported to another area can be specified.

### **Module 13 - 3D MASSHAUL AND VOLUME CENTROIDS**

The movement of material in a cut/fill operation can be presented by distance lines between the cut and fill areas. The total volume in a cut or fill area can be shown at the centroid of that volume. This could typically be used to plan the most effective earthworks operation for bulldozers scrapers or trucks.

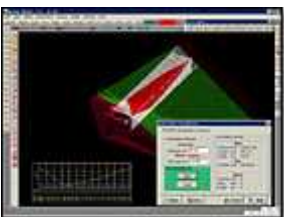
### **Module 14 - OPTIMISING TERRACES**

Where terraces need to be designed in very restricted areas this module can be used to determine the perimeter of a terrace within a specified boundary. MODEL MAKER determines a final elevation, outside perimeter and volume for each terrace according to specified slope parameters.



### **Module 15 - RURAL POWER LINE DESIGN**

This module uses the geometric alignment strings and CAD modules to design the route and pole positions for rural power lines. A user-definable pole database can be created, as well as standard profiling templates.



### **Module 16 - EARTH DAM DESIGN**

Indicate the centerline position of a dam wall, specify the wall construction parameters and catchment area and within minutes calculate various position options. The result is dam earthworks volumes and water capacity.



### **Module 17 - IRRIGATION SYSTEM DESIGN**

This module will assist the irrigation design engineer with a flexible and indispensable tool without confining him to rigid limitations. Full graphical control over the automatic and manual design of an irrigation network is provided. Analyzing the hydraulics of an open network with predefined or computer selected pipe sizes is done with ease. Global manipulation of groups of pipes and nodes may be done to optimize the design. Standard pipes, emitters and fittings may be defined in a

user database. Model Maker DTM and CAD functions are available throughout the design.



### **Module 18 - ROAD GEOMETRY**

Designing the horizontal alignment geometry of a road is supported by using this module to determine sight distances on horizontal curves. Vehicle turning circles may also be tested graphically within confined areas. The test vehicle dimensions and parameters may be fully defined by the user and the result is a graphical output of sight lines or vehicle wheel paths.

### **Module 19 - WGS84 CONVERSION**

Co-ordinates from the old South-African Clarke datum may be converted to the new WGS84 datum using this module. The WGS84 datum is implemented in South-Africa as from January 1999 and all new surveys must be done in this format. Using this module you may do a transformation of all the data loaded into MODEL MAKER i.e. DTM, CAD and geometric alignment strings.

### **Module 20 - HYDROSIM STORMWATER LAYOUT**

After drawing the layout of a storm water pipe network and the catchment areas in Model Maker's CAD, this module may be used to create the data needed by the **HYDROSIM - Storm water analysis program**.