# The user manual for LISCAD SEE Software for a beginner

## Welcome to LISCAD Surveying & Engineering Software

• You have collected the field survey data. Now the next step is to process the field data. To process the data software is needed- LISCAD SOFTWARE.

LISCAD 6.2 Professional Version's basic user manual will be presented as:

1. Double click on the Icon SEE (displayed below) to open the software.



2. When Double click, the screen shown below will be displayed. Now go to file as shown in the figure and click **new** to create new see file.

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3. When you click NEW, the screen shown below will be displayed. By default, it will show my Document. Now, navigate to Local Drive D or E depending upon the availability of drives in your computer.



4. Click at the **New Folder** icon, the screen shown below will be displayed. Give the name of folder for instance **Survey\_data** 

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5. Double click to the folder that you have created; the screen shown below will be displayed. Then give the name of file for instance **Ringhending or give your own name** and Press **OK** 

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6. When Pressed OK, the screen shown below will be displayed- LISCAD SEE Plan View showing Liscad Menu, Plan Toolbar and Generic Toolbar

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- 7. LISCAD can be customized with any of the modules available. However the most economical way to purchase LISCAD is with a pre-configured packages:
- LISCAD Lite: Preparing field data for input into a CAD system
- LISCAD Standard: Includes Computations, Input/output, Adjustment and Transformations
- LISCAD Professional: Includes Computations, Input/output, Adjustment, Transformations, Background Images, Modeling, Volumes, Engineering Design and Profiles
- **LISCAD Education Network**: Includes all modules and runs on a network with up to 10 user s at a time (For educational institutions only)
- Upgrades: Upgrades from any previous versions are possible

## There are different modules depending on the package you have chosen.

- 8. **Utilities**-Available for all the packages except for Liscad Lite and configure LISCAD to your personal Preferences: Set Units, Colours, Symbols et.View table and create new code codes, Can produce reports of the data.
- 9. Input/Output- Available for all the packages except Liscad Lite Transferring data to and from other system Support over 40 different total stations and GPS system, Import and export a variety of exchange files like DXF, DNG, ARC Info and Geocomp
- 10. **Computations**-This module is also available for all the packages except for Liscad Lite. Create and editing of Points, Lines, Polygons, Text, Alignment, examine the attributes of Points, Lines, Circles, text, alignment etc. Editing and Change of feature codes etc can be done in this Computation Modules.
- 11. Adjustment Available for all the modules except for Liscad Lite. There will be always errors during the field observations and needs to be adjusted especially the traverse stations/control points.
- 5. Transformation- Available for all the modules except for Liscad Lite.

The transformation is necessary if we wanted to transform from one **coordinate system** to another system. For example from Local Arbitrary Coordinates to Bhutan National Coordinate Systems-Drukref or to Indian GridII B, Etc.

- Terrain Modelling- Available for only Liscad professional and Liscad Educational Network only and not available for Liscad Standard. Validates and computes digital terrain models, segments breaklines and generates contour maps, complete with user defined labels.
- Profiles- Available for only Liscad professional and Liscad Educational Network and not available for Liscad Standard.

This is very powerful and very fast tool for creating Longitudinal Section and Crosssection for road construction, water pipeline and Road Design from the elevations.

The L-Section and Cross-Section can be exported to AutoCAD for further editing and for use by the users like engineers, Planners and architects.

- 8. **Volumes** Available for only Liscad professional and Liscad Educational Network and not available for Liscad Standard. Calculates quantities to a base datum, or between surfaces. A new model of height differences can be generated.
- 9. The Liscad Software Modules can be displayed when you click TASK



1. Before creating the field file, the Unit setting has to be done from US feet to Metric system because when you first install and open the new see file, by default the units are displayed in US feet. So go to Task and click **utilities** as shown below.



2. Now click on **Configure** as shown below.

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 When you click units, the screen shown below will be displayed. Click onto meter on Linear, Ha/Sq. meters on Area, Cubic meters on Volume and rest leave as it is and click OK. Now, the unit is meters.

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4. Now Go to TASK and then to FIELD TRANSFER



5. When Click Field Transfer, the screen shown below will be displayed.

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6. Go to **SETTINGS** and then to CODE DEFINITION to choose the correct code definition to match you field coding as shown below.

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The feature coding system used in the field was 4 digit alpha codes with 2 digit string identifiers at the end (CCCCSS). Hence make the settings as shown.

Under String Identifier, select:

- a. 2 characters
- b. String At End

- c. Non Stringing Char 0
- d. Under Code, select:
- e. Size 4
- f. Codes was Alpha
- 7. Similarly Go to SETTINGS and then to TOLERANCES to set your Instrument and target height range.

- 10. **Creating Field File.** The data that have been downloaded are of raw file. It is necessary to create a field file for further editing of the data. So the following steps are to be followed for creating field file.
  - a. Go to Task, then click Field Transfer, the screen as shown below



**b.** Then go to Resolve and click Create Field File.

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c. When you click Create Field File, screen shown below will be displayed. Then navigate to your raw file where you have downloaded and select the raw file. By default the Files of Type will display as Raw File (\*.raw) and may not read the raw file. So, in Files of Type, select All Files.

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**d.** Then select the **raw file** Click **Browse** to go to a required folder where you want to store your filed file and click **save.** 



e. When you click Save, the screen shown below will be displayed, Press **OK**.

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f. When click OK, the screen shown below will be displayed and ask to select the data recorder. Scroll down and Select **TPS1000**. Press **OK**. The Field file will be created

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11. Editing of Filed File. After creating the field file, it needs to be edited/ corrected like reflector height, Code etc. that might have input wrongly during the field observations. The following procedures are:



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**d.** When Press open the field file will be opened on **Notepad** by default as shown below. Now check and edit /correct the field file referring to the field note book and save and close it.

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- **12. Reduce of Field File.** Once the field file is corrected, it has to be reduced to display the data into the form of a Map on the screen.
  - a. Gø to Task and then Click Field Transfer



b. Go to resolve and then Click Reduce field file. Navigate to your field file folder, select the field file and Click **OK**.

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C. When Press OK, the **Liscad Report (Error Report)** will be displayed. If there are errors like duplicate identity numbers or other errors that would affect the data, then note down the line number and again open the field file and edit it until you get no error report.

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d. Then Close the Liscad Report. When close the Liscad Report, it will show warning whether to continue or not. If there are no errors then Press YES if there is any serious errors then Press NO and edit the field file.



e. When Press yes, the data will be displayed as shown below. Close the Liscad Report and Start Editing of the **data** like, creating of Building, Shed and Road lines, Change of Point and line Symbols and styles as required etc.



- **13. Creating and Editing of the survey data in SEE file.** The data needs to be edited like creating of building lines, change of direction of line etc. Any editing and creating of points and lines are done in COMPUTATION modules as shown below:
- a. Go to Task and Click Computations as shown below.



b. When Click computation, the screen shown below will be displayed with the editing facilities line create point, **line**, **Delete point**, **Delete line by using the Icons**, breakline



1. **Creating of new Lines.** For Example to create a new line of a Building, firstly, on the plan toolbar, Check BLDG on both Point Attribute and Line attributes columns as shown below.



a. Go to Create a Line. Click create and then scroll down & select Line



b. Select methods. There are number of methods for creating lines. Depending upon the situation and nature of the lines to be created, any methods can be used. For example, if one of the rectangular building edges is to be created, **Traversing Method** is used.

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c. Using travesing method, one of the corners of the **building has been created** as shown below and other corners also can be created by same method.



d. To join a line, which has the points. Used the 'Line by Existing Point' button as shown below to join a line along the points.

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e. The line is joined along the existing points as shown below:



f. To Change the line Style of building. To change the line style and the colour of a building, firstly set attributes- click line attributes and change as required as shown below.

To change line style, Click Line Style and for colour click colour and press update code table and OK after changing.



g. Then go to Edit, Scroll Down to Attributes, Line as shown below.



h. When Click Line, the screen shown below will be displayed.

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- i. Then click on the building line you require to change, the line style and colour will be changed.
- j. If you want to change the direction of a line for instance, the Bank top line,

🏜 LISCAD - Computat	tions - "Rinchending"	- [Plan View]			
I ask Create Method Att	ibutes Edit Errors Examine B	lock <u>D</u> isplay <u>W</u> indow <u>H</u> elp			_ 8 ×
Image: Second system         Image: Second system <th>Eute         Edit         Egrors         Epanho         B           Do         Delete         Enable/Disable         Move           Market         Enable/Disable         Move           Rotate         Scale         Exchange Axes           Point on Line         Best Fit         Alignments           Objects         Objects         Exclusion           Point Clamber         Point Clamber         Exclusion           Best Fit         Alignments         Objects           Point Clamber         Point Clamber S         Exclusion           Best Fit         Segment Line         Segment Line           Job Line         Insert Point         Remove Point</th> <th>ect Display Window Help</th> <th>Provide     Provide     Provide       BEDG     1013       BEDG     1013       BEDG     1012</th> <th>BLDG *1010</th> <th>Et 1059 BLDG</th>	Eute         Edit         Egrors         Epanho         B           Do         Delete         Enable/Disable         Move           Market         Enable/Disable         Move           Rotate         Scale         Exchange Axes           Point on Line         Best Fit         Alignments           Objects         Objects         Exclusion           Point Clamber         Point Clamber         Exclusion           Best Fit         Alignments         Objects           Point Clamber         Point Clamber S         Exclusion           Best Fit         Segment Line         Segment Line           Job Line         Insert Point         Remove Point	ect Display Window Help	Provide     Provide     Provide       BEDG     1013       BEDG     1013       BEDG     1012	BLDG *1010	Et 1059 BLDG
Edit Line Attributes					
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k. When you click line, the screen shown below will be displayed. Click **none** and **check in reverse line style**. Then Click on the bank top line, the line will be reversed to the other direction.



#### I. Break Line.

a. When you want to delete a portion of line, break line command is perform. Under computation, go to edit, scroll down you will find **break line command.** 



b. Use right mouse button to snap to **point 155**, and the line through this point will highlight.
 Select the Break button, to divide this line string into two components contiguous at point 155. Repeat this process to also break the lines at points 154 and 100.

Select Close. Use right mouse button to snap to point, and the line through this point will highlight. Select the Break button, to divide this line string into two components contiguous at point. Repeat this process to also break the lines at points.



c. Now to delete the break line, use right mouse button to snap to point 155 and 154 line and left click the line 154 to 155 will be deleted.



## 14. Digital Terrain Modeling.

The digital terrain modeling (Generate Contours) is performed after the completion of all editing works.

a. Click **Task** and then click **Terrain Modeling** module, the screen shown below will be displayed.



b. When you click Terrain Modeling, the screen shown below will be displayed.



c. Now click **Modeling and then Validation** to check any errors before terrain modeling is performed.



d. If there are errors, the screen shown below will be displayed. The **errors report** can be viewed when you click **View**. Now, edit the errors like break lines and duplicate points having same coordinates until you get **no errors encountered then click OK**.



e. To form modeling and then Form Model. The screen shown below will be displayed. Then Press **OK** 



f. Click **OK**, the **Terrain Models** will be formed. Now right the mouse, click at feature display. Check Contours and contour interval as you desire. E.g. 0.5 m or 1 m and then Click **OK**, the contours will be displayed with values.



g. The contour lines may be formed outside the **surveyed area**. So delete the contour lines which are in the form of Traingles by selecting Edit, **Delete triangles** as shown below.



When you Click at Delete Trinagles, the screen shown below will be displayed.
 Now Right click the mouse at the required triangles to be deleted, it will **bighlight in Red colour** and Left Click the mouse to accept. The triangle will be deleted.



- 15. **Data Conversion**. Liscad See data has to be converted to the format which is compatible to MXRoad software for Road Design. To convert the data the following procedures are required.
  - a. Click TasK. Scroll down and select Data Conversion as shown below.



b. When you click Data Conversion, the screen shown below will be displayed.



c. Now go to Export, Scroll down and Click Moss. Then navigate to your file or folder where you want to save the data as shown below and Press Ok, OK. The data will be exported and ready to be opened in MX Road.

### 16. Data Transformation.

Data transformation is performed where there are two different data sets with different coordinate systems to transform into one system or a set of data that needs to be transformed into National Coordinate System. To do so at least 3 survey stations' common coordinates are required to observe.

a. First open the data or map that is to be transformed for example map B. Click Task and then **Transformations** 



b. When click transformations, the screen shown below will be displayed. Click on **Coordinates** and then **define transformation** 



c. When click on define transformation, the screen shown below will be displayed. You will find two separate columns- Left- **Control** and Right- Local. Now input at least 3 pairs of stations' coordinates. The data/map of the local coordinates system should be opened to be transformed.

Now, check whether you have correctly entered the coordinates and go to **Compute** and then scroll down and click **3D Çonformal** if you have elevations with your data



d. When you click on 3D Conformal, a transformation **report showing** the residuals will be displayed. If the residuals are within the acceptable errors then close the report and proceed with the next step.

e. Now go to Coordinates and Click **Apply Transformation** as shown below. When you click, apply transformation, a small **dialogue box** will be displayed. Now click on **Move**, all the data will be transformed.



f. Now you can see figure below that the data has been transformed-the direction has been changed. Transformation is complete and needs to be merged the two sets of data.



- 17. Merge of files/data. Now two sets of data needs to merged after transformation.
  - a. Go to Task and then **Utilities**, the screen shown at the right hand side will be displayed.



b. When you click merge in a file on the right hand side of the above screen, the screen shown below will be displayed. Now select the file that you wanted to merge and click open. When you click open, all the groups/layers will be displayed or highlighted. Then click **merge**, the data will be merged.



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c. The screen shown below is the merged map of the two sets of data

