TERRAMODEL NOTE 2A

Creating Coordinate
Survey Files

Objective--

The objective of this TM Note is to outline a procedure to create a
coordinate file from electronic survey data. A total station survey
file will be downloaded directly from a data collector into
TERRAMODEL and translated to a coordinate file.

Developed by:

Travis Mooney
Stacy Deisley

Reviewed by:

Bob Sullivan
Randy Mason

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TERRAMODEL Note 2A - Creating Coordinate Survey Files

These instructions are written for the Sokkia SDR33 expert data collector loaded with version 04-04.26 of the data collector software.

The following steps are used to develop a coordinate file from a total station/data collector survey:

a.   Connect the SDR-33 data collector to the computer.

b.   Prepare TERRAMODEL to receive data from the data collector.

c.   Set up the data collector to download the activity log (OBS view).

d.   Download the observed survey data through Download/Import

e.   Create a report of the survey that contains all of the data required by TR-62 using the Raw Data Editor.

f.   Print a hard copy of that report for the producer file.

g.   Export/Import points from the new file to an existing file (if necessary).

Before any files are opened or started, some default settings should be checked. *You will only need to check these settings once* (unless you re-load TERRAMODEL).

[File] – Download/Import – [Import script manager…]

Find SDR2xraw_d+i in the list of Script file names.

Highlight SDR2xraw_d+i and click the box on the left so that a ✓ appears.

With SDR2xraw_d+i still highlighted, **[Edit…]**

Click on the file tab labeled Raw data settings

Make sure Level: is set to **Secondary control**, Import coordinates: set to **All coordinates**, and Import bearings: set to **All bearings** (Fig. 2A-1).

Also on this same file tab, make sure "Display raw data editor" is set to **Always**. If the raw data editor is turned off, TERRAMODEL will not reduce the survey data into a points file; only keyboard-entry points will appear.
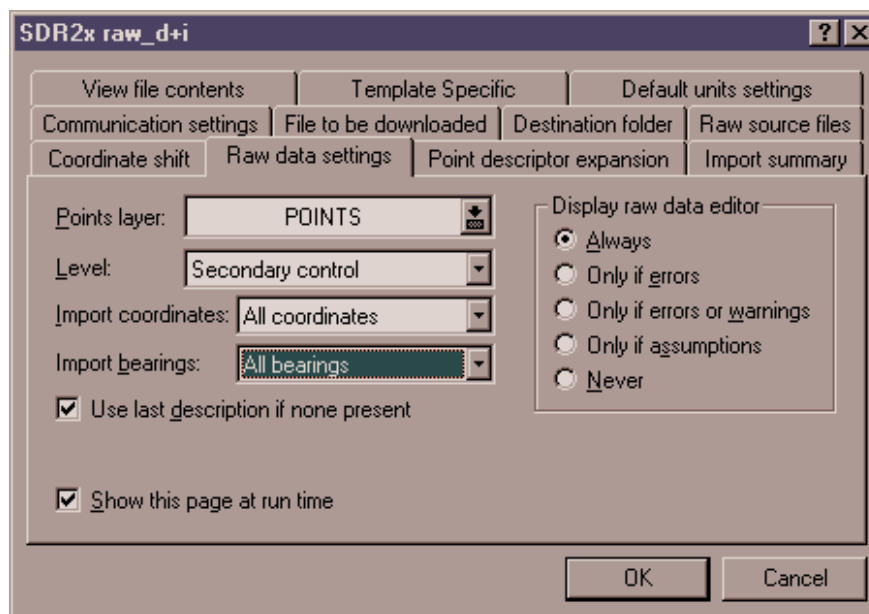
Fig. 2A-1

[OK]

[Close]

We are now ready to go through the tutorial with a new TERRAMODEL file.

[File] – [New…]

Select the desired folder for the project and give the file a name.

[Save]

*NOTE***:** If you are trying to download additional points into an existing file, you may run into errors. If you can not download into the existing file, download the additional points into a *new* file and then follow the instructions as explained in: g. Export/Import points from the new file to an existing file and contact the author of this note.

a. Connect the SDR-33 data collector to the computer.

Connect the data cable to the cable fastened to the top of the data collector.

Connect the data cable into the proper port location on the back of the computer.

b. Prepare TERRAMODEL to receive the file from the data collector.

[File] – Download/Import – [SDR2xraw_d+i]

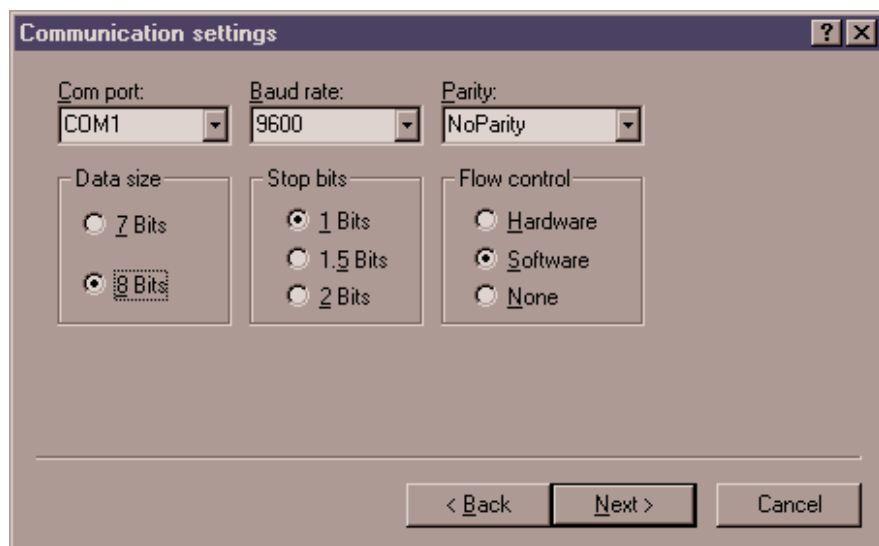 "Communication settings" dialog box will appear (Fig. 2A-2).

Fig. 2A-2

*NOTE***:** If you wish to change the default settings for any of the dialog boxes so that you are not making the same adjustments every time you download, go to

> [File] – Download/Import – [Import script manager…]
>
> Highlight the script you wish to change and **[Edit…]**
>
> Here you can change the defaults and choose whether or not you wish to see the dialog box at run time.

Communication settings should be as follows (this may be different depending on how you have your data collector set up):

Com port: **COM1**
Baud rate: **Check data collector to ensure the computer and the data collector are**
                   communicating at the same speed
Parity: **NoParity**
Data size   **8 Bits**
Stop bits   **1 Bits**
Flow control   **Software**

[Next>]

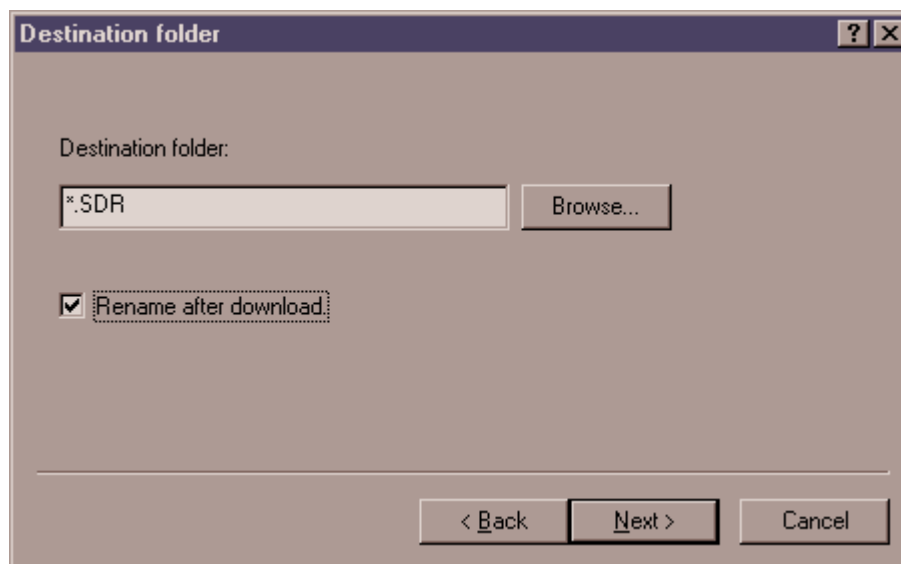"Destination folder" dialog box will appear (Fig. 2A-3).

Fig. 2A-3

The Destination folder will contain all raw data from the data collector before it is imported into TERRAMODEL. Enter your desired file location under Destination folder: You can type in the location or use **[Browse…]**. Once you have entered the desired location, <u>you must create a new folder by typing an original name at the end of your Destination folder line (this can not be an existing folder name). You must create a new folder for every download</u>.

✔Rename after download if you wish to rename the file, else leave the box unchecked to keep the same file name that is on the data collector.

[Next>]

"Download/Upload Summary" dialog box will appear (Fig. 2A-4).
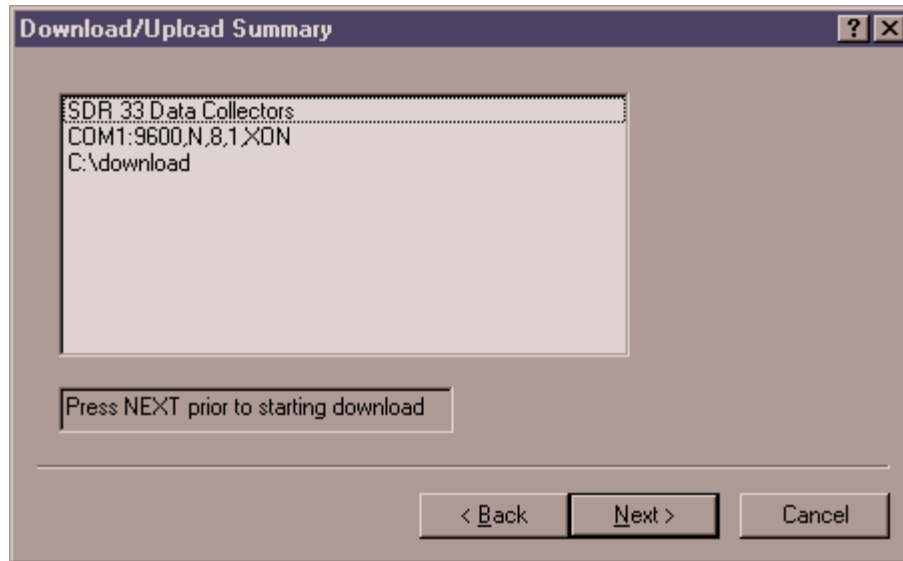
Fig. 2A-4

Scan through the information to verify input from previous screens. Notice that in the bottom left corner of the dialog box the message states "Press NEXT prior to starting download".

c. Set up the data collector to download the activity log (OBS view).

You should now prepare the data collector for sending the survey in OBS view. In this TERRAMODEL note, we will be downloading the OBS data from the data collector. This should be the only information necessary for each project.

1.   Select **FUNC** by pressing the **{F1}** key on the data collector.

         NOTE: The user may need to press the **{Clear}** button to get to the main menu.

2.   Highlight **Communications** using the up or down arrows on the data collector; press **{OK}.**

3.   Set the data format to **SDR**. Use the left or right arrow on the data collector to toggle between the data format options.

4.   Select **COM** by pressing the **{F2}** key on the data collector. The settings should be as shown below:

Port	**Top**
Modem	**No**
Baud rate	**9600 (this rate varies between data collectors)**
Word length	**8**
Parity	**Not set**
Stop bit	**1**
Output delay	**0**
File	**No**

NOTE: To toggle between choices, use the left or right arrows. To move to the next selection, use the up or down arrows.

5. When the settings are correct, press **{OK}.**

6. Select OPTNS by pressing the **{F1}** key.

7. Set **Current View** to **No** using the left or right arrows.

8. Highlight **OBS view**; toggle to **Yes**.

9. The remaining views should remain as **No**.

10. Press **{OK}**

11. Select **SEND** by pressing the **{F4}** key.

12. With **Select jobs** highlighted, press **{OK}.**

13. Highlight the job to be downloaded; toggle to **Yes**. DO NOT PRESS **{OK}**.

NOTE: Download only one job at a time so that all jobs can be assigned a unique file name.

d. Download the observed survey data through Download/Import.

[Next>] on Download/Upload Summary dialog box.

TERRAMODEL is now waiting for information from the data collector. At this point download the information from the data collector by hitting **{OK}.**

NOTE: If everything is set up right you will see the information flashing by in the lower left corner of the dialog box. If not, go back and start over paying close attention to the items selected in each screen.

"Choose a new file name" dialog box will appear (Fig. 2A-5) if you checked this option on the "Destination folder" dialog box. Rename your file. If you checked the box on "Destination folder" but do not wish to change the file name, you can use the file name that shows (which is the name from the data collector).

TERRAMODEL will put a *.dat extension on the end of your file name automatically.

If you did not check this box on Destination folder, you will go right to "Download/Upload Summary".
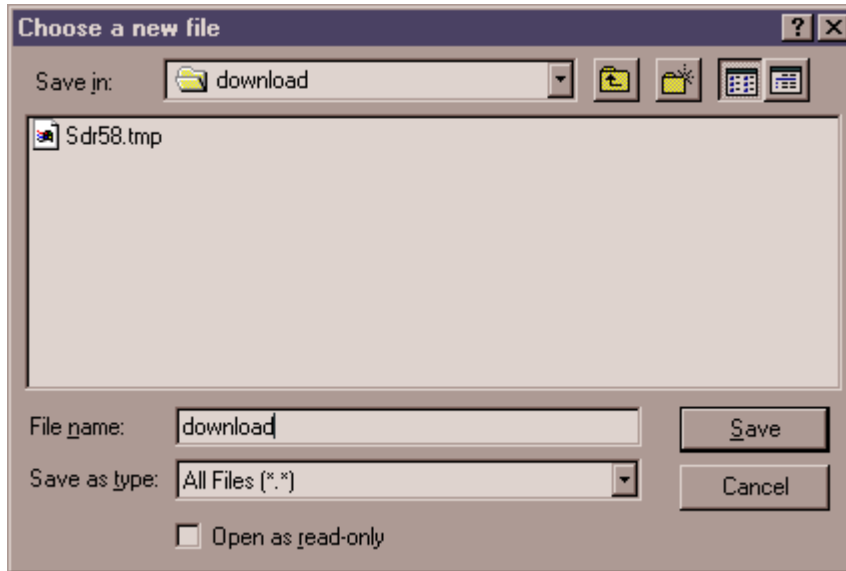
Fig. 2A-5

[Save]

The Download/Upload Summary box will reappear with "Operation Succeeded" on the bottom line if your survey was downloaded (Fig. 2A-6).
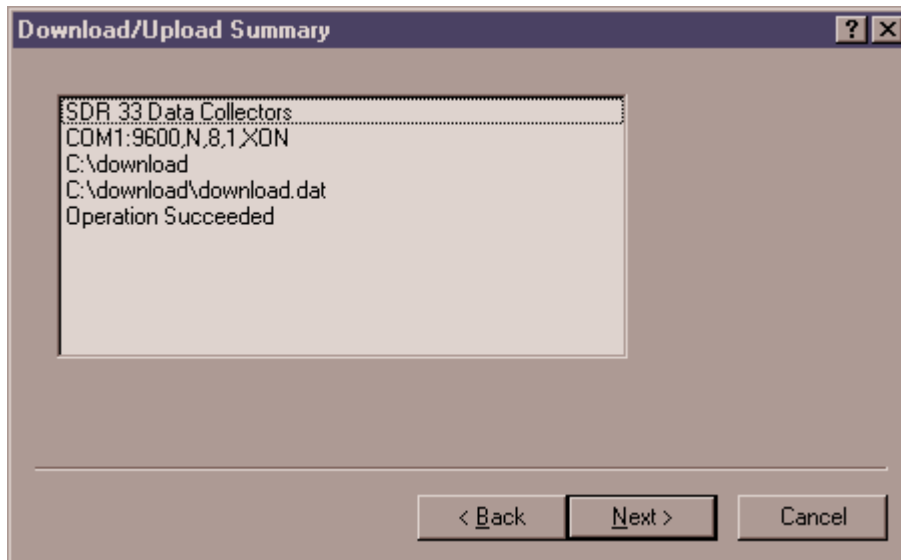

Fig. 2A-6

[Next>]

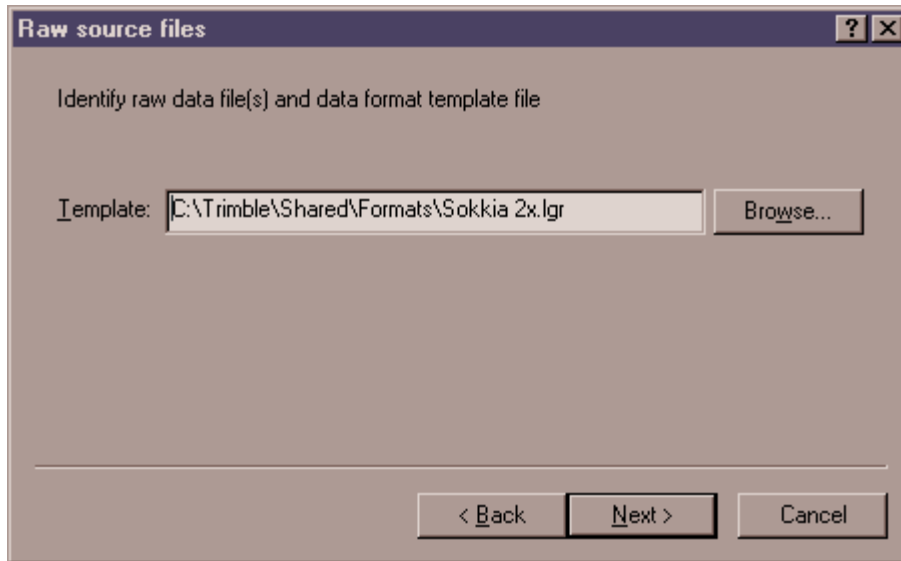"Raw source files" dialog box will appear (Fig. 2A-7).

Fig. 2A-7

The Sokkia2x.lgr format template should appear in the Template: box. If not, **[Browse]** and choose this template.

[Next>]

"View file contents" dialog box will appear next, look through the information and see that it contains the data that you expected.

[Next>]

"Default units settings" dialog box will appear (Fig 2A-8).
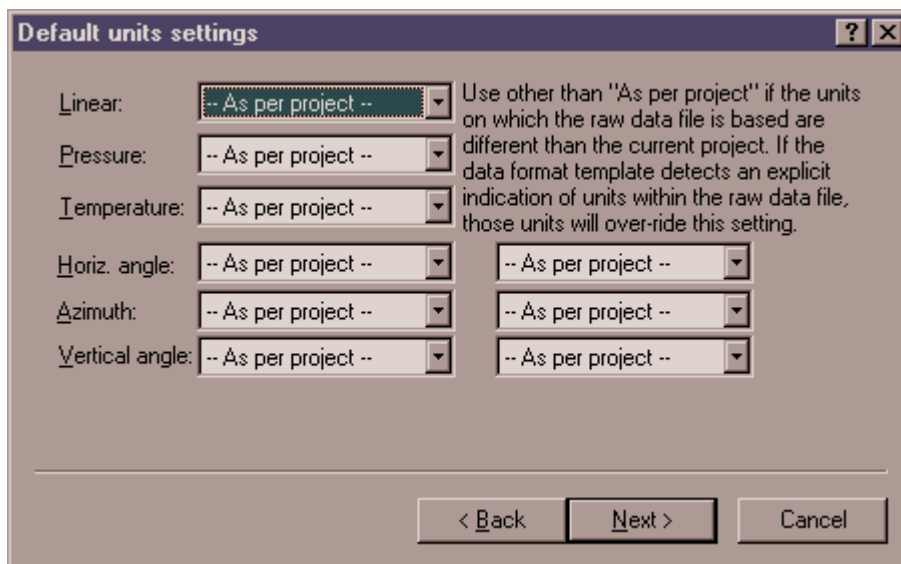

Fig. 2A-8

Use this screen to indicate the measurement units TERRAMODEL uses when importing raw

survey data into a TERRAMODEL project. You must instruct TERRAMODEL as to the units to interpret the coordinate values contained within the points file being imported. If that file is based on a different unit of measure than that currently established within the project file, TERRAMODEL will convert them accordingly. When importing data collected by total station, all units settings may be left as "As per project". An example situation of when you would want to change these unit settings is if you are bringing points in that were surveyed in meters and your TERRAMODEL file is set up for feet.

[Next>]

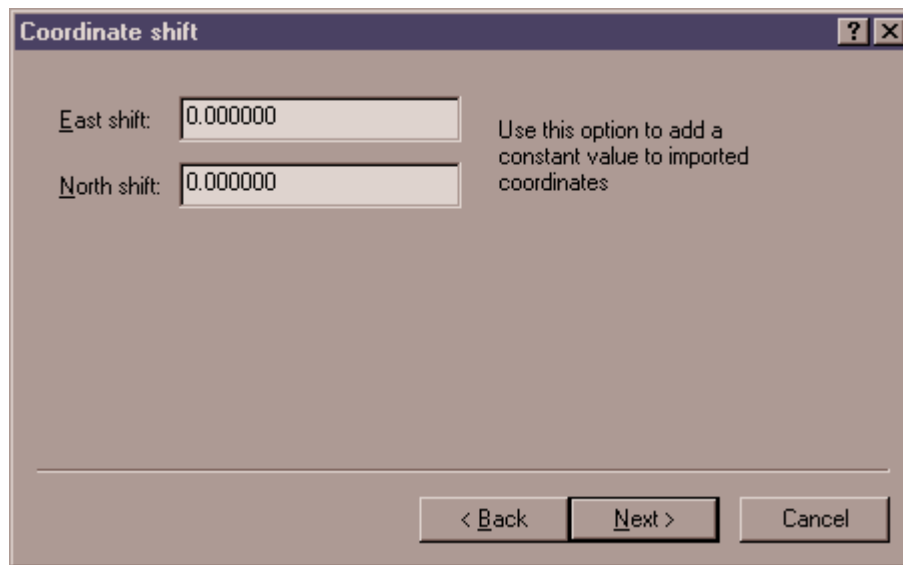"Coordinate shift" dialog box will appear (Fig. 2A-9).

Fig. 2A-9

Use this window to enter East and North shift values to add a constant value to imported coordinates. This feature allows you to correct that data to represent the actual coordinate values. If you do not need to adjust your survey data, leave the East and North shift values as **0.00.**

[Next>]

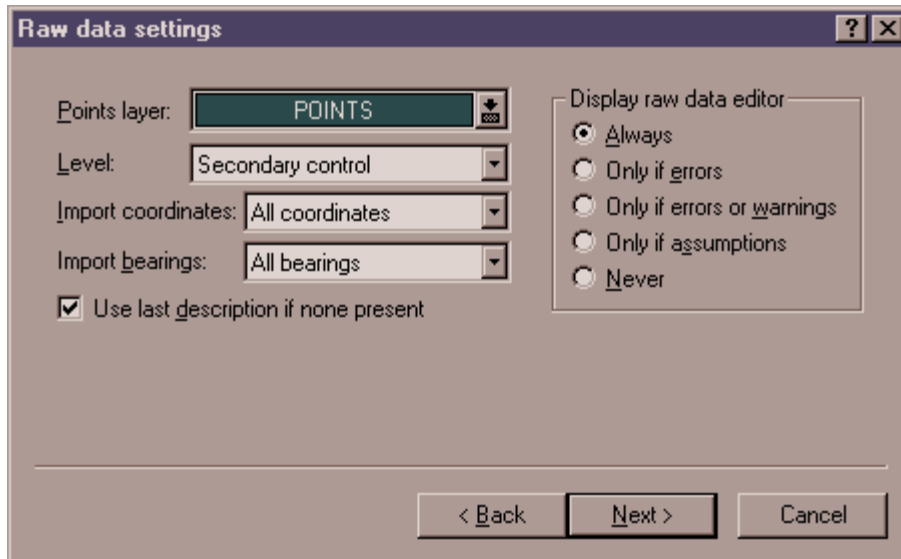"Raw data settings" dialog box will appear (Fig. 2A-10).

Fig. 2A-10

Use this screen to designate miscellaneous raw data settings. The settings as shown above should work for almost all Nebraska NRCS surveys. For help on these items, refer to the TERRAMODEL on-line help files.

[Next>]

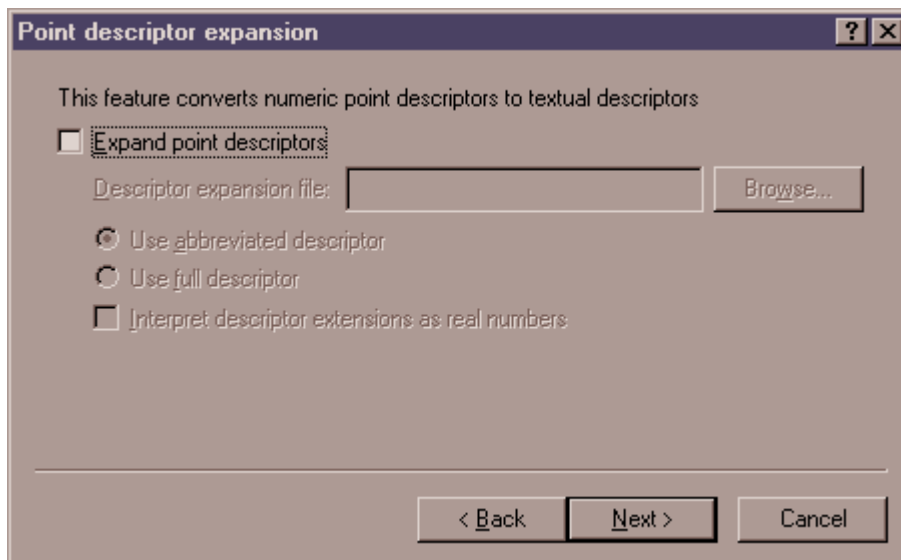"Point descriptor expansion" dialog box will appear (Fig. 2A-11).

Fig. 2A-11

Numeric point descriptors may typically be assigned in the field when using data collectors in order to simplify the data entry process or to accommodate instruments or data collectors that do not employ an alphanumeric keyboard. Use the point descriptor expansion dialog box to convert or expand these numeric descriptors to the desired alphanumeric equivalent, based on the instruction provided within a point descriptor expansion file.

For typical Nebraska NRCS surveys, we will not use numeric point descriptors and will not need to check this box.

[Next>]

"Import summary" dialog box will appear. Scan through the information to ensure the settings you selected in the previous screens is listed properly here.

[Import]

[Finish]

e. Create a report of the survey.

"Raw Data Editor" (RDE) dialog box will appear (Fig. 2A-12).

This editor finds traverses, intersections and resections, computes coordinates, and performs coordinate adjustments for the imported raw data automatically. The raw data editor also includes an interactive data editor that allows you to add new information or modify the current information.

You can access all the RDE functions and option from the RDE Menu bar and the Survey job dropdown list at the top of the RDE dialog box. The RDE File menu allows you to create or delete a survey job of raw data. Each survey job is edited separately although all survey jobs are calculated and adjusted collectively. The RDE Edit menu options allow you to modify the raw data and to create new data. Remember to print and set aside an unedited, raw survey file before making any changes. You may also want to save an unedited TERRAMODEL file to keep as backup in case you need to return to the original survey data. The Tools menu options allow you to set overall project and display parameters and to set assumptions and tolerances for adjustment calculations. The Survey job control, a dropdown list, allows you to select a specific job of a survey project to display in the display pane.

To use the RDE it will take some trials and errors because it is very powerful. Don't be afraid to experiment with this option, just save your unedited TERRAMODEL file when you get to this option, you can always recall it and start over.

*NOTE***:** A common change to be made to the RDE is an elevation adjustment. To adjust the elevation, insert a change in rod height (which may have been missed during the survey).

Place your cursor in the data where you need to add the new TARGET line.

> [Edit] – [Insert Empty Observation] on the Raw Data Editor (RDE)
>
> Type **TARGET #.##**
>
> **[Enter]** on the keyboard

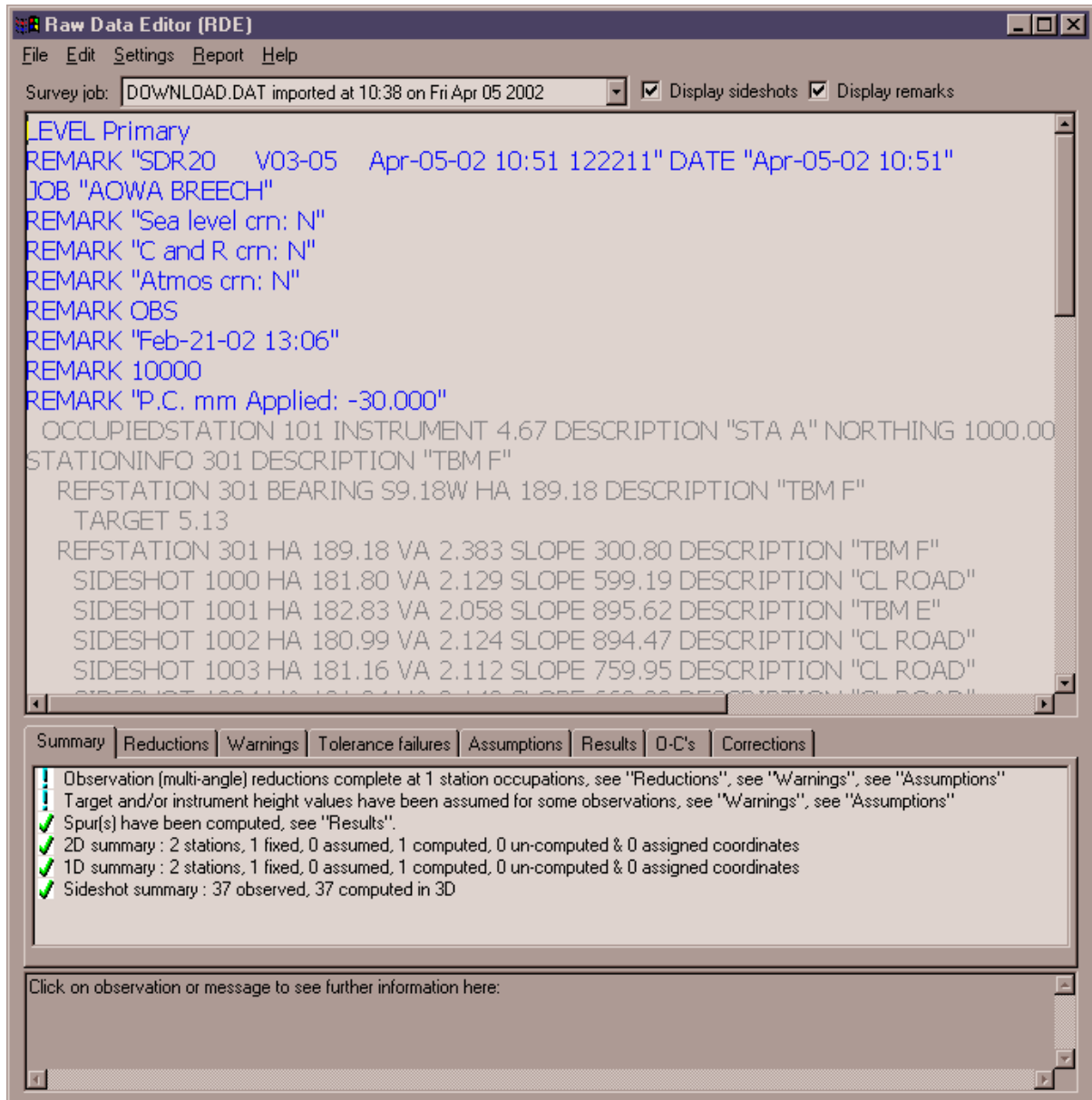These changes will be saved the next time you save your TERRAMODEL file.

Fig. 2A-12

[Settings] – [Editor Settings…]

On the Raw Data Editor Settings file tab, uncheck the box under Point protection, Stop Delete, Stations (Fig. 2A-13). Removing this check will allow you to edit your shots later in TERRAMODEL if you need to.

Also on this tab, uncheck the box for Enable recognition. This will prevent duplicate point error messages if you have taken a shot in the same location twice, such as to close on a benchmark.
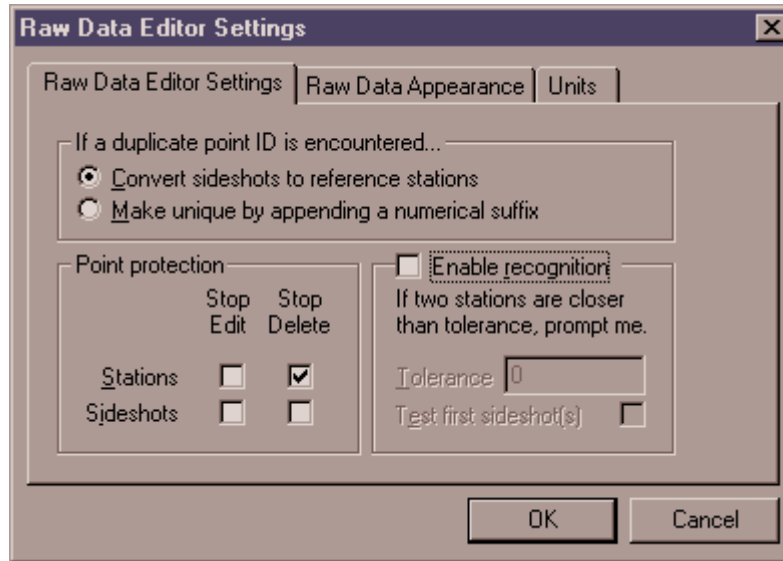
[OK]

Fig. 2A-13

[Settings] – [Computation Settings…]

Choose the General Settings file tab (Fig 2A-15).

Under Computation procedure, Adjustment method:, click on the down arrow and choose **No Adjust**. The other choices will take any error you had in your survey and distribute it among the points so that the data on your TERRAMODEL screen will no longer match what you collected with the data collector.

Under Assumptions, make sure the Easting and Northing reads **1000**. If 1000 is not already in the boxes, change the values to 1000.

Choose the General Tolerances file tab.

Under Target heights, Maximum height (Fig. 2A-14), you may need to increase the value to reflect your tallest rod height. It is recommended to set the height a tenth or two above your tallest rod height to make sure TERRAMODEL will calculate the elevation for all shots.
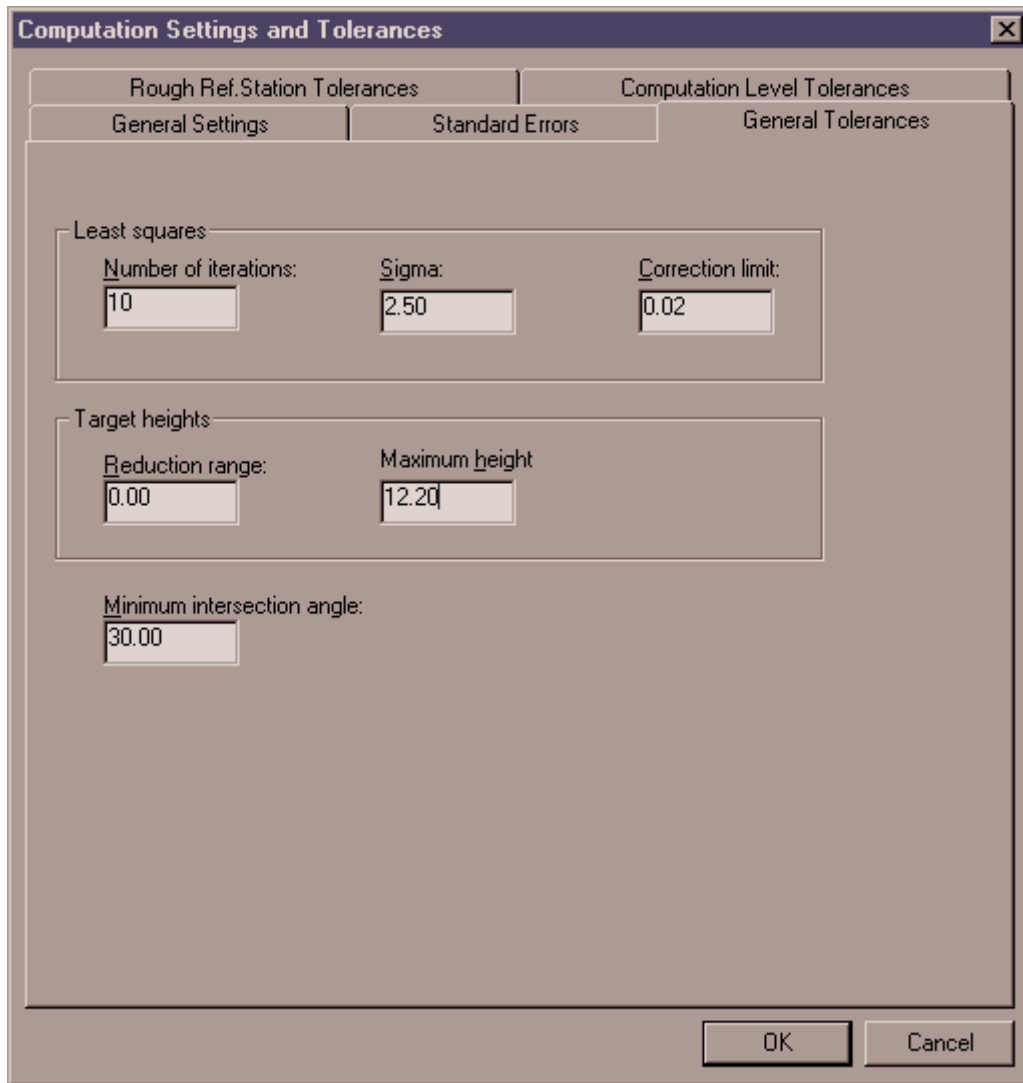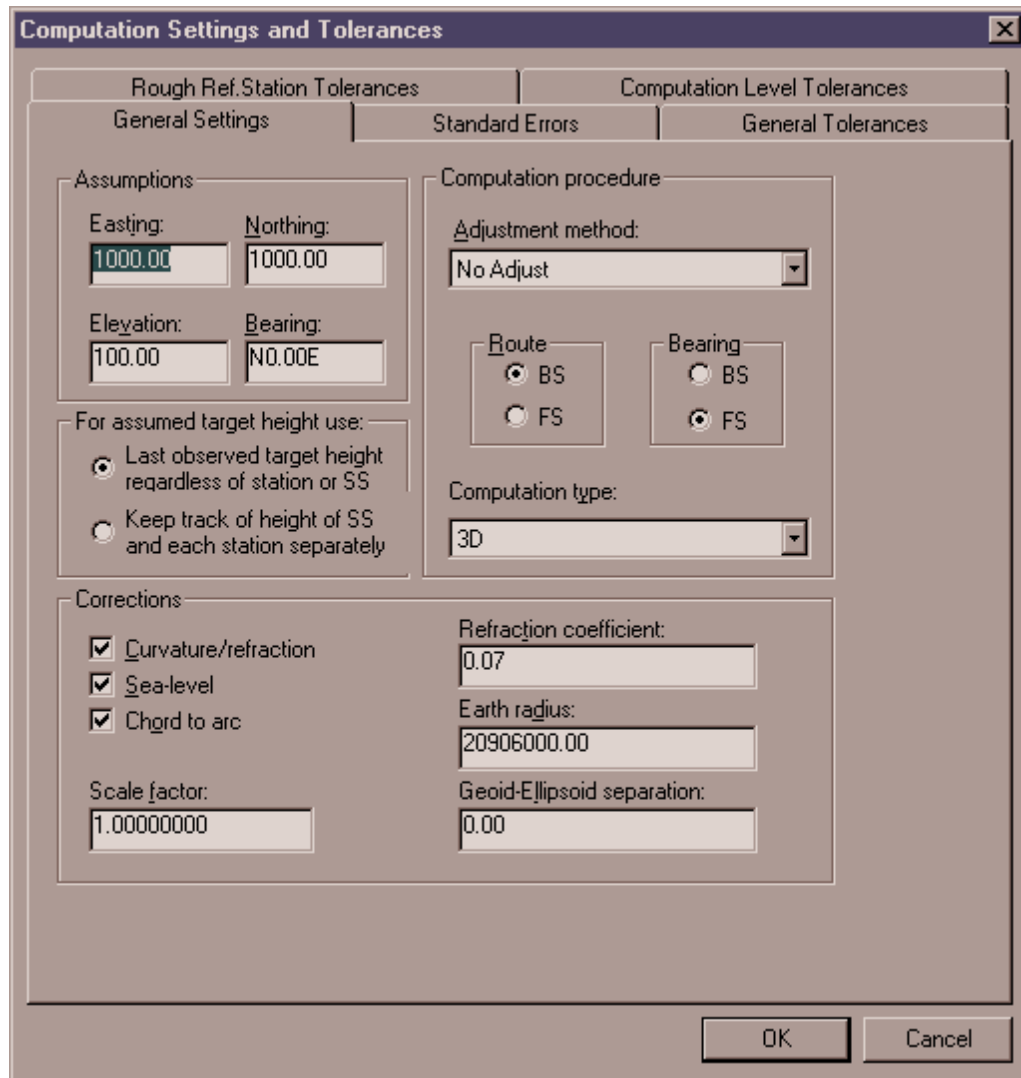
Fig. 2A-14

[OK]

Fig. 2A-15

f. Print a hard copy of the report for the producer file.

You now need to print out the OBS data report to keep for the producer file.

In order to get the data to print out legibly, we need to change the appearance of the data.

[Settings] – [Editor Settings…]

Under the Raw Data Appearance tab, choose Proportional as the Font style.

[OK]

[Report] – [Report…]

The Raw data report is the report that needs to be printed and kept with the producer file.
The Computed coordinates report gives the Northing, Easting, and Elevation of each shot

and may be a good tool to use to begin the project.

Check Raw data, Computed coordinates, and any other reports you wish to see, check "Print each report on separate page" (Fig. 2A-16) and **[OK].**

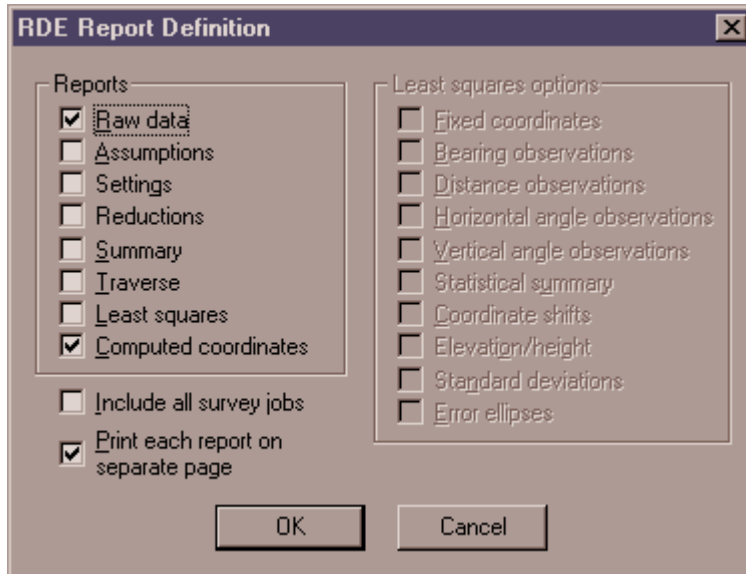

Fig. 2A-16

The reports will be shown in the Document – P3Pad. At this time you can save or print the reports, just like any other TERRAMODEL report.

Warning: The file should be saved on a floppy disk as a permanent record. **Do not electronically edit this file in any way**. Points that are incorrect will be dealt with at a later time. If the file will later be edited and saved with the original file, the original file should be renamed *filename*.raw to avoid problems with identical file names.

Along with saving the file electronically, print the report with the unedited data and place it in the producer file.

[File] – [Print…], **[OK]** to print the report

[File] – [Close] on the Document-P3Pad

[File] – [Exit] on the Raw Data Editor (RDE)

Your points will now be displayed in the Plan View.

You will notice some new lines and shapes drawn between and around the new points. These objects are on layers named RDE_***. You can easily remove these objects by turning the visibility of these layers off.

You can get back into the Raw Data Editor at any time while working in a project:

[Edit] – [Raw Data Editor]

g. Export/Import points from the new file to an existing file.

You do not need to go through this step if you have just downloaded an original survey or if you were successful adding additional survey points to an existing survey file. If you have encountered errors while trying to add additional survey to an existing file, follow the instructions listed below and please contact the author of this note.

First we will export the points from the new TERRAMODEL file into an ASCII file.

[File] – Export/Upload – [ASCII Points]

NOTE: If ASCII points is not an option for export/upload, it can be added under Export script manager. (This process is explained at the beginning of this note.) Also, if you more or less dialog boxes show on the screen than what are shown in this note, the settings can be changed under script manager.

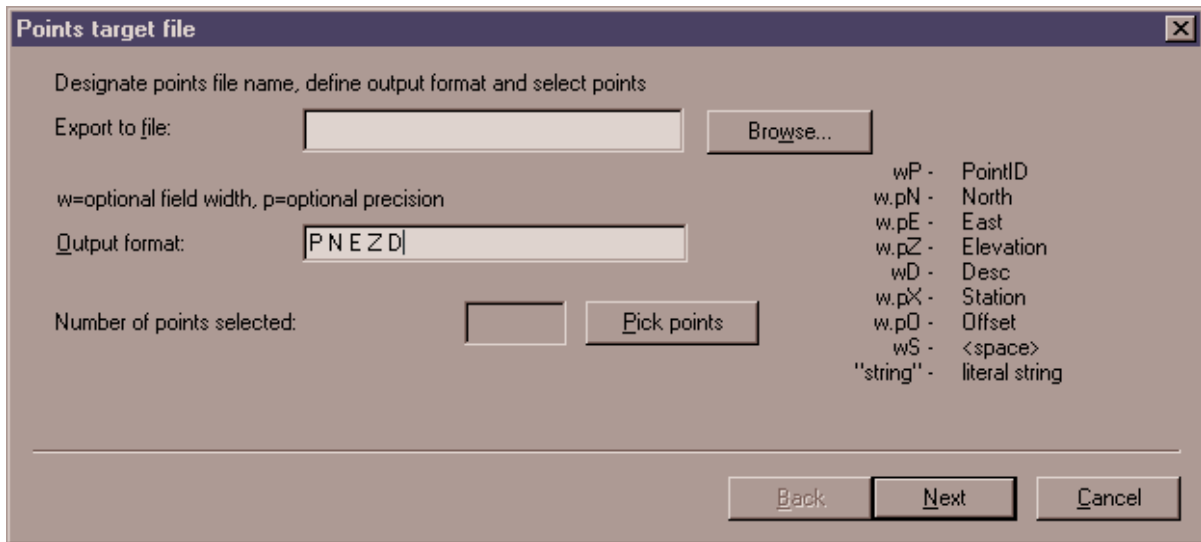"Points target file" dialog box will appear (Fig. 2A-17).

Fig. 2A-17

Export to file: Type in the file path or **[Browse]** to select the *.pts file destination.

Output format: **P N E Z D**

Pick points: **[ ]** Select Points (suggestion to right click and choose by layer)

      [OK]

[Next]
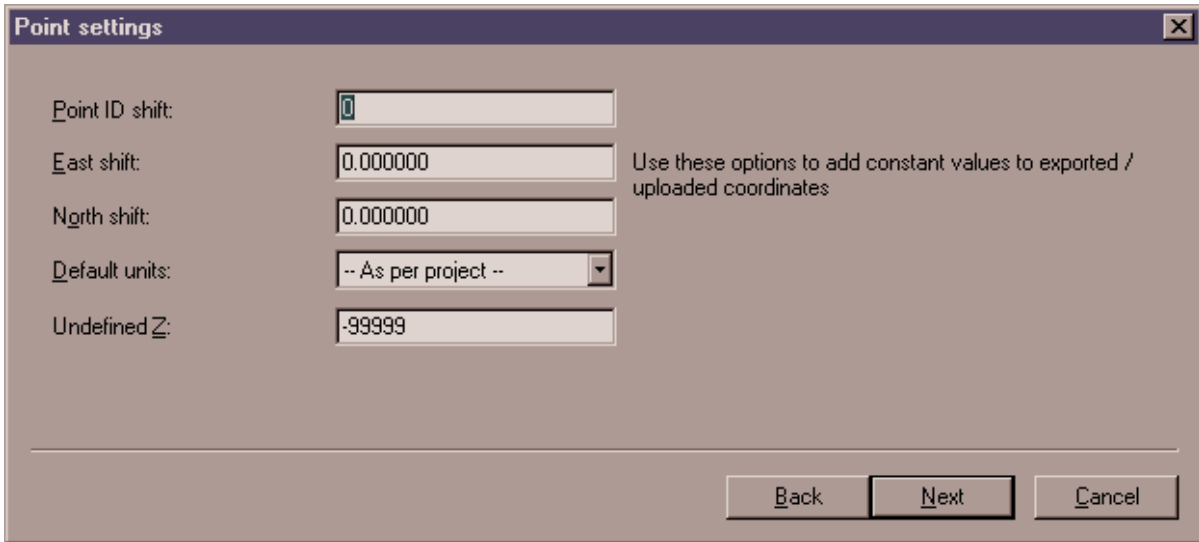
"Point settings" dialog box will appear (Fig 2A-18).

Fig. 2A-18

You should not need to make any changes to these defaults unless the new survey does not align properly with the original survey.

[Next]

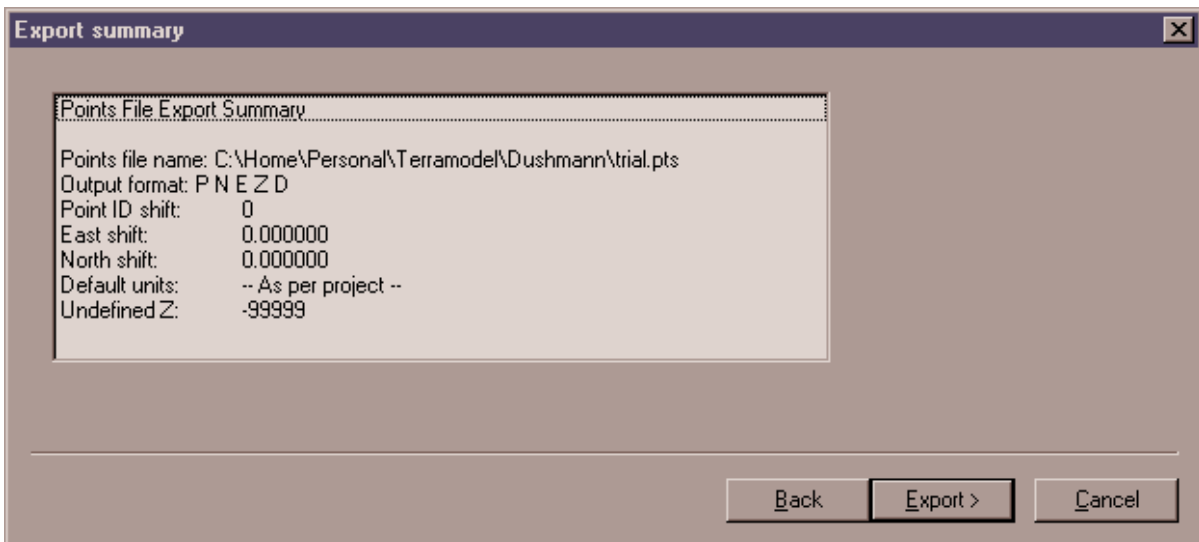"Export summary" dialog box will appear (Fig. 2A-19).

Fig. 2A-19

[Export]

[Finish]

If you have not saved the TERRAMODEL.pro file, you should do so now.

[File] – [Save project]

Then open the file with the original survey you wish to add this new survey to.

[File] – [Open…]

Then begin the Import script.

[File] – Download/Import – [ASCII points]

"Points source file" dialog box will appear (Fig. 2A-20).

Points source file

Identify points file(s) and data format template file

File(s): | | Browse…

Template: C:\Program Files\Trimble\Shared\Formats\Generic P | Browse…

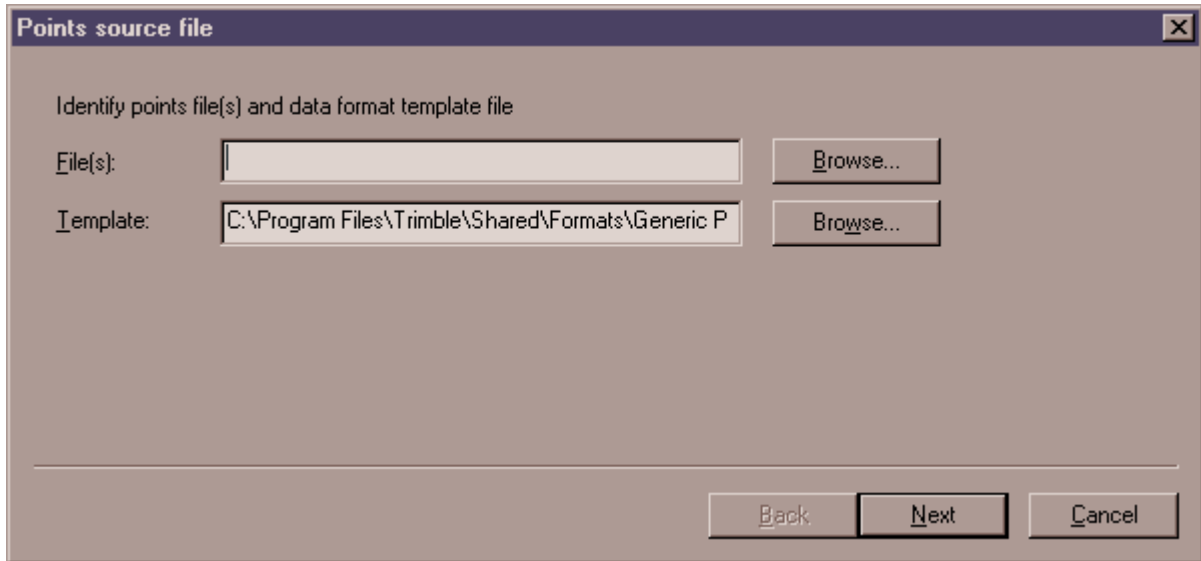Back   Next   Cancel

Fig. 2A-20

File(s): Type in the *.pts file path or **[Browse]** to select the file destination.

Template: Generic Points.lgr (default) is okay.

[Next]

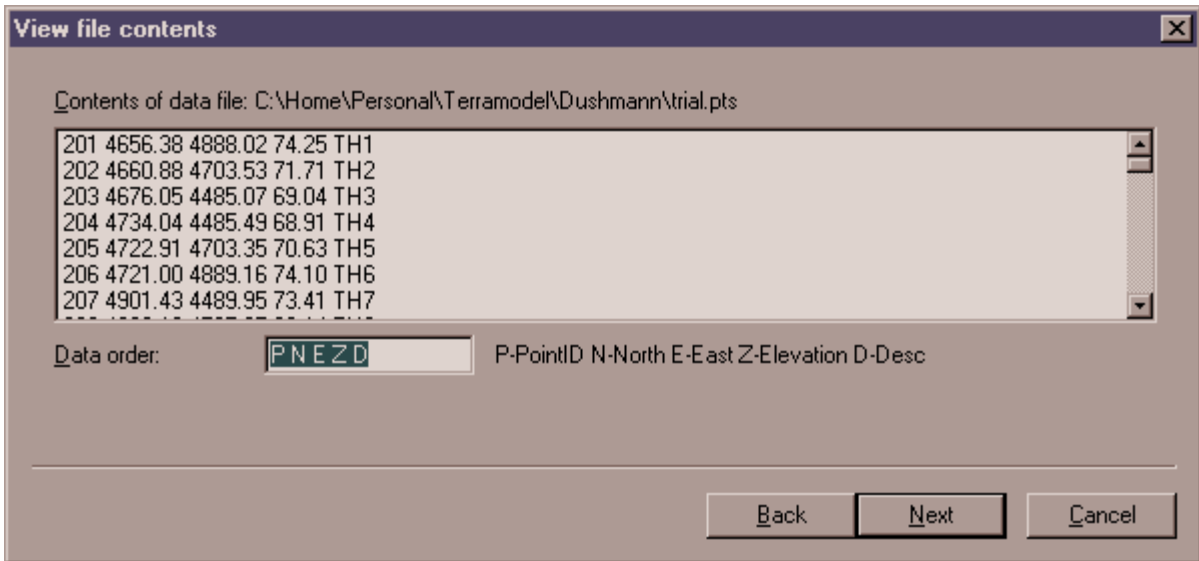"View file contents" dialog box will appear (Fig. 2A-21).

View file contents

Contents of data file: C:\Home\Personal\Terramodel\Dushmann\trial.pts

```
201 4656.38 4888.02 74.25 TH1
202 4660.88 4703.53 71.71 TH2
203 4676.05 4485.07 69.04 TH3
204 4734.04 4485.49 68.91 TH4
205 4722.91 4703.35 70.63 TH5
206 4721.00 4889.16 74.10 TH6
207 4901.43 4489.95 73.41 TH7
```

Data order: **PNEZD**   P-PointID N-North E-East Z-Elevation D-Desc

[Back] [Next] [Cancel]

Fig. 2A-21

Data order: **P N E Z D**

[Next]

"Point settings" dialog box will appear (Fig. 2A-22)

Point settings

Point layer: **POINTS**   Starting point ID: 1

Undefined Z: -99999   Point ID shift: 0

☐ Use last description if none present

Duplicate point ID's
- ⦿ Renumber
- ○ Make unique
- ○ Overwrite
- ○ Discard

Clip to boundary: 0   [Pick boundary]
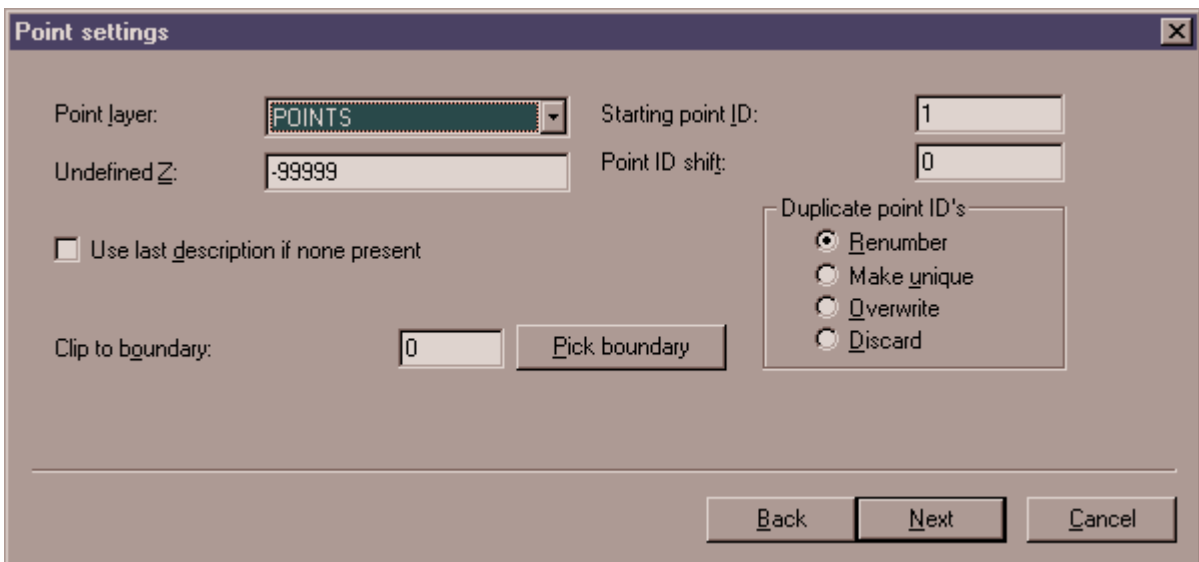
[Back] [Next] [Cancel]

Fig. 2A-22

Make changes as needed for your particular file to this dialog box.

[Next]
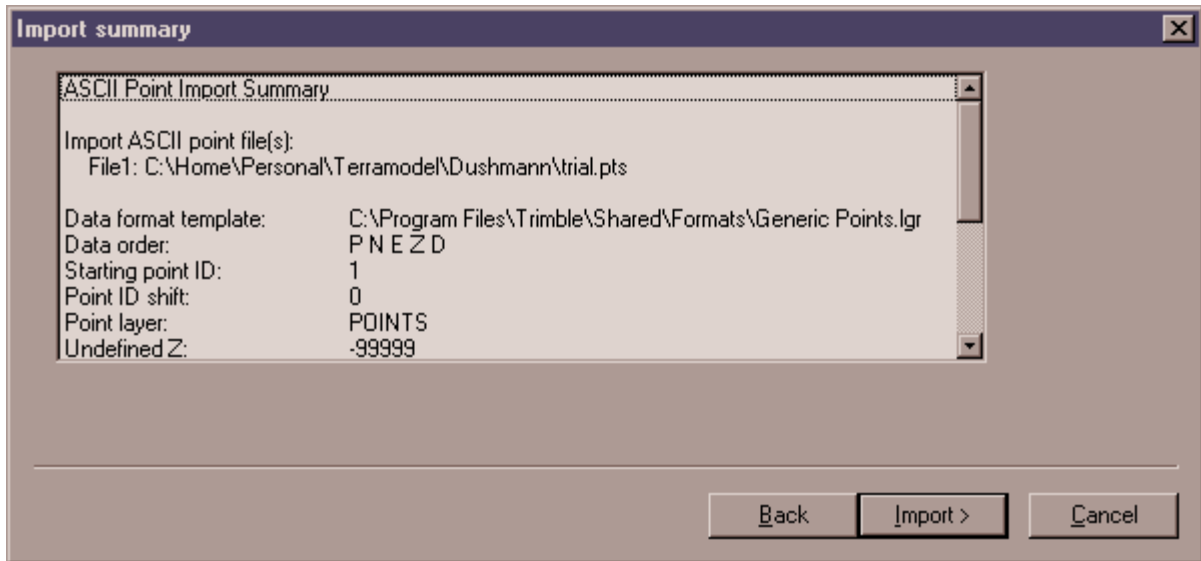
"Import summary" dialog box will appear (Fig. 2A-23).

Fig. 2A-23

If everything looks acceptable on the summary, **[Import]**. Else **[Back]** and change inputs in the previous dialog boxes.

[Finish]

Your new points should appear in the drawing with the original points.

If you would like a listing of your new point numbers,

> [Reports] – [List]
>
> **[Points]**
>
> Select points: **[ ]** (suggestion to right click and choose by layer or point number)
>
> **[Options]** Choose which information you would like displayed for the points
>
> **[OK]**
>
> **[List]**

The points will be displayed in a report format that can be saved, printed, etc.

> [File] – [Close] when you are finished with the Document-P3Pad.