

***Introduction to DU***

**Notes**

**Introduction** DU (DigiPro Utilities) provides a number of specialized utilities that can help you manage your project databases. With DU, you can:

- Import data from files using G-Tilt, PCSLIN, Geokon, IDAGraph, and Campbell formats, as well as several popular spreadsheet formats.
- Enter data manually.
- Validate and edit data.
- Enter data for settlement corrections.
- Process spiral data sets.

**Special Considerations for Users of DMM or Digi2**

Slope Indicator has added a field called “stickup” to the project database (this field is discussed under “Y-offset” in Chapter 4). In DigiPro, the stickup adjustment is temporary and the same value is applied to every data set.

Some users have requested that a permanent stickup value be stored with each data set so that stickup value can be specific to each data set. When DU loads a data set created by DMM prior to August 11, 1993 or by Digi2 prior to September, 1993, DU asks if it should add the new stickup field to the database.

If the field is added, the database will no longer be compatible with your version of the DMM or Digi2 program. Slope Indicator will provide a free upgrade of either program on request.

Until you have the upgraded program, we recommend that you answer “no.” DU can read your database in any case.

## What is a Project Database?

### Project Database

DigiPro uses project databases created by Slope Indicator's Digi2 software, DataMate Manager (DMM) software, or DigiPro Utilities (DU) software.

A project database holds:

- Sensor records
- Installation records
- Data sets for each installation

We recommend that you create a new database for each project.

### DigiPro Database Files

The files listed below are the files that can be associated with a DigiPro project database. A given database will not necessarily use all of these file types. Some files types will only exist when certain options are being used.

<PROJECT NAME>.HDR  
 <PROJECT NAME>.NHD  
 <PROJECT NAME>.DBF  
 <PROJECT NAME>.RH  
 <PROJECT NAME>.NRH  
 <PROJECT NAME>.DAT  
 <PROJECT NAME>.NDA  
 <PROJECT NAME>.SNS  
 <PROJECT NAME>.NSN  
 <PROJECT NAME>.ZON  
 <PROJECT NAME>.NZO  
 <PROJECT NAME>.GSA  
 <PROJECT NAME>.MAN  
 <PROJECT NAME>.NMA

When copying a database, the easiest method is to use the DOS copy command for the project name with a wildcard for extensions (example: COPY <PROJECT NAME>\*).

Index files are automatically created when they are missing. These files can be erased to save space when archiving old databases. They can also be omitted when copying a database.

### Sensor Records

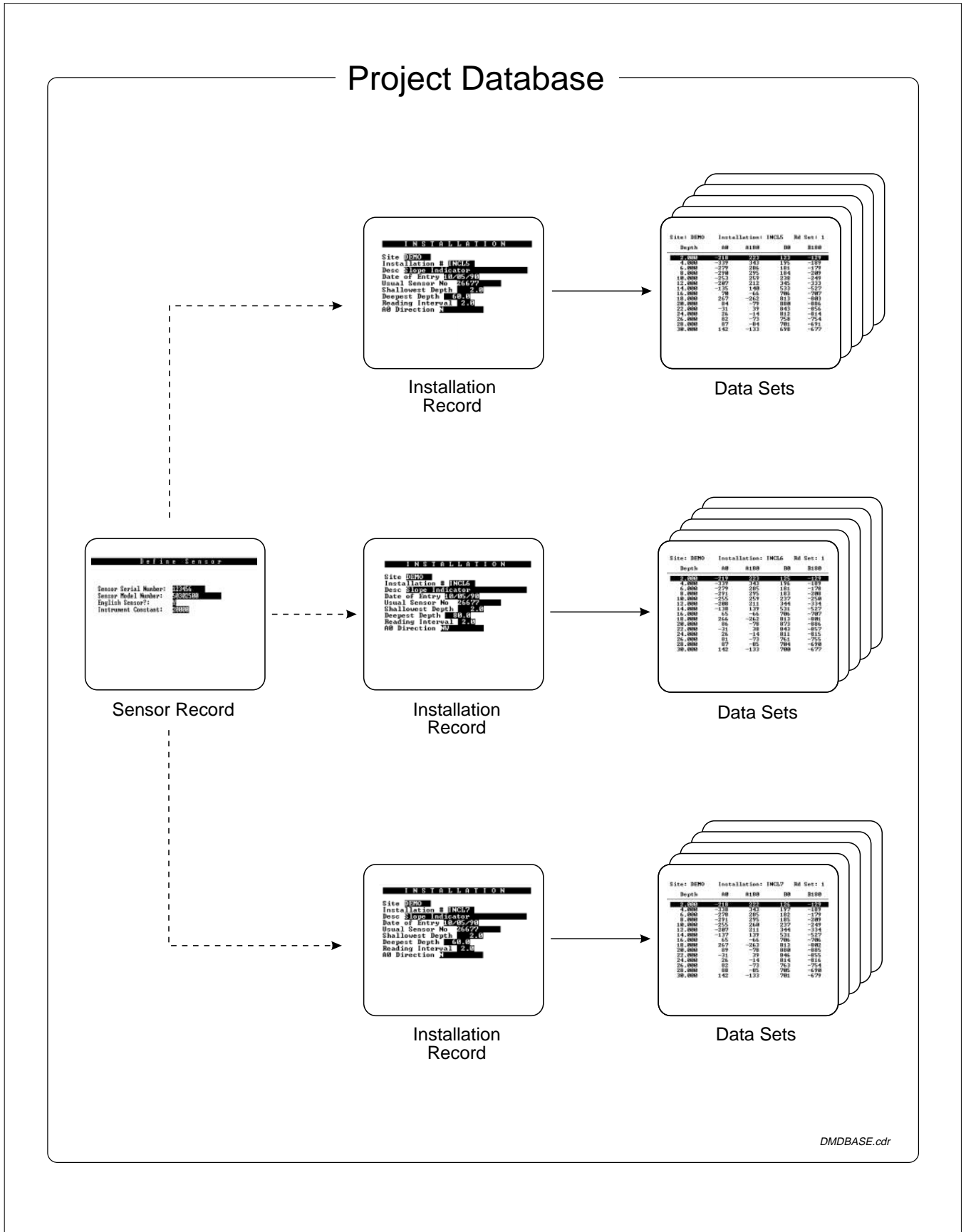
A sensor record is required for each inclinometer probe that you have. The record contains information such as sensor serial number, model number, English or metric version, and other information.

### Installation Records

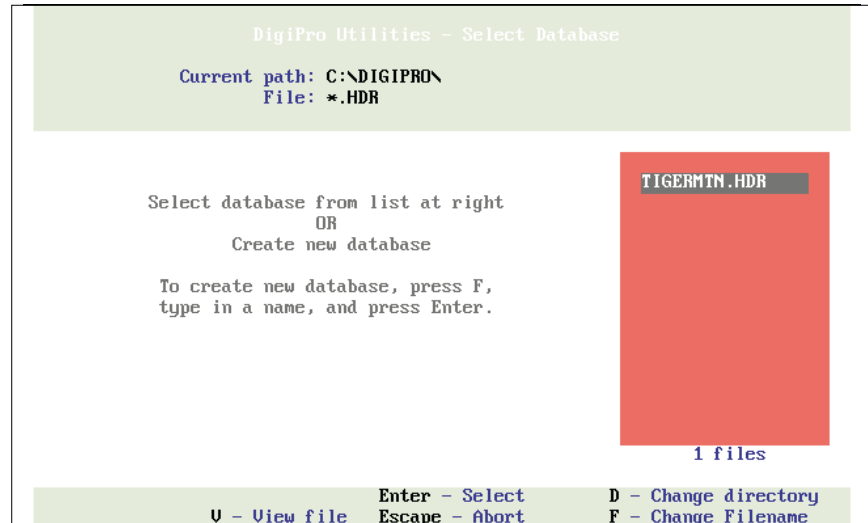
An installation record is required for each inclinometer installation. Each record contains an identifier and information such as depth, reading interval, and orientation.

### Data Sets

A data set record for each survey. Each record contains the time and date of the survey, the operator's initials, and the inclinometer readings.



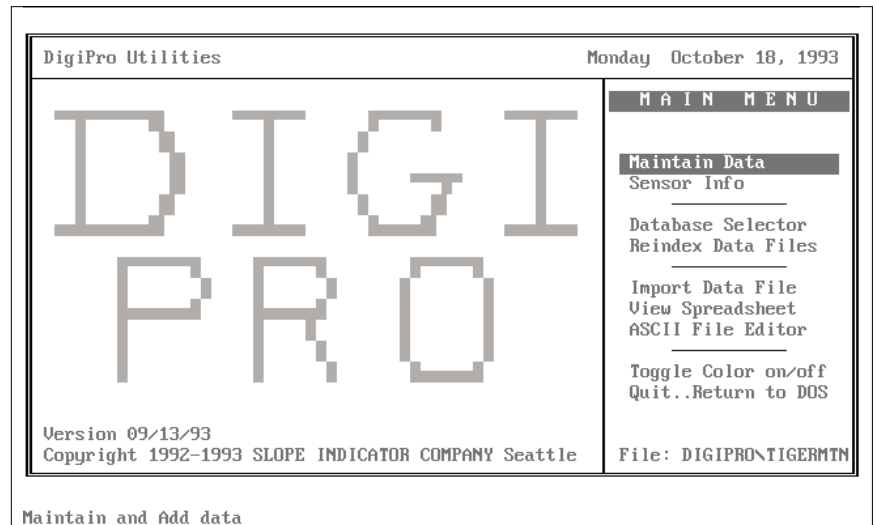
- Starting DU**
- 1** During installation, DU was placed in `c:\digipro`. Change to that directory: type `cd c:\digipro` and press Enter.
  - 2** Type `du` and press Enter.
  - 3** DU displays the database selection screen shown below. You can select an existing database or you can create a new one. See Chapter 2 for details about creating a new database.



The window on the right lists any project databases that are found in the DigiPro directory. If you don't have any other project databases yet, press Enter to select the sample database, **TIGERMTN**.

If you use DMM or Digi2, your project databases are in a different directory. Type **D** for **change Directory**. Enter the drive, path, and directory name, then press Enter. DU now displays the databases that it finds in that directory. Move the highlight bar to the one you want and press Enter.

- 4** DU displays its Main Menu.



## Main Menu

To select a command, press the highlighted key (typically the first letter of the command). You can also move the highlight bar to the command and press Enter.

**Maintain Data:** This command provides access to most of DU's database management functions. Use it to create or rename installations, renumber data sets, edit and validate data, and to enter data for settlement and spiral corrections.

**Sensor Inf:** This command provides access to information about the inclinometer probe. Use it to add or modify a sensor record.

**Database Selector:** Use this command to select a different project database.

**Reindex Data File:** DU uses index files to speed access to data. It's a good idea to run this command from time to time to keep index files compact. If you ever have trouble accessing your data or some records seem to have disappeared, try re-indexing. It will probably solve the problem.

**View Spreadsheet:** Use this command to view spreadsheet data prior to importing it. See Chapter 2 for details.

**ASCII File Editor:** This is a simple ASCII file editor. See Chapter 12 for details.

**Toggle Color on/off:** Use this command to switch between DU's color and monochrome mode. DigiPro will save the "state" of the toggle if you exit the program (at the end of your session) by typing **Q** for quit rather than by pressing Enter.

**Quit...Return to DOS:** Use this command to exit DU.

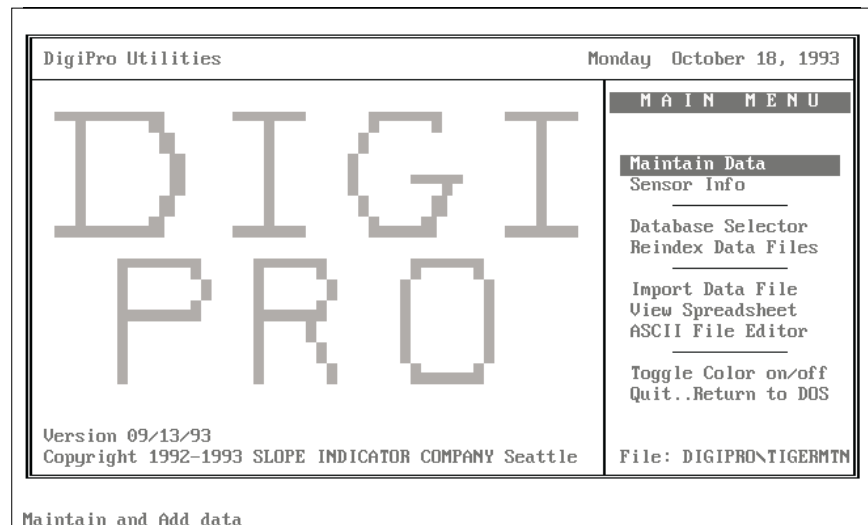
**Maintain Data** From the Main menu, type **M** for **Maintain Data**. This command provides a “window” onto the database. Actually, it provides three windows that correspond to the hierarchy of the database:

- The “Installation” window displays all the information related to each inclinometer installation. This window is active by default.
- The “Data Set” window displays information about the survey.
- The “Data” window displays the readings for the data set.

When a window is active, its title is highlighted. Commands listed in the box on the right side apply only to the active window.

To activate the next window (move down the hierarchy), type **O** for **Open Next**. To activate the previous window (move up the hierarchy), type **Q** for **Quit** or press **E**.

Main menu



## Installation Window

- Selecting an Installation
- 1** The first installation in the database is displayed. This is DU's equivalent of "selected." You must select an installation before you can view the data sets that are associated with it.
  - 2** To select a different installation, type **N** for **Next**. If there are many installations, you may prefer to type **L** for **List**, move the highlight bar to the installation you want, and press Enter.

### Installation Commands

**Add, Modify Copy, and Delete:** These commands let you make changes to the selected installation.

**Rename Site:** This command makes lets you change the identifiers for the installation. This is discussed in Chapter 3.

**Field Notes:** This command lets you keep a log for each installation. These notes cannot be printed.

*Installation window*

I N S T A L L A T I O N	Data Set	C O M M A N D S
Site SR18 Installation # TM2 Desc Slide at Tiger Mountain Date of Entry 03/08/93 Usual Sensor No 1 Shallowest Depth 2.0 Deepest Depth 70.0 Reading Interval 2.0 A0 Direction Orientation 0.000 Offset/Stickup 0.00		Open Next Quit/Return ----- Beginning End Next Previous List ----- Add Modify Copy Delete ----- Field Notes Rename Site
Data		
Make next window active		

## Data Set Window

- Activating the Window** To activate the data set window, type **O** for **Open Next**. Notice that the title “Data Set” is highlighted. The list of commands at right now applies to data sets.
- Selecting a Data Set**
- 1** DU will display only the data sets for the installation that is currently selected. The first data set is displayed (selected).
  - 2** To select another data set, type **N** for **Next**. If there are many data sets, you may prefer to type **L** for **List**, move the highlight bar to the data set you want, and press Enter. You can also type **J** for **Jump To**; type the number of the data set you want, and press Enter.
- Data Set Commands**
- Write ASCII:**Exports the data set as an ASCII file.
- Compare:** Displays deviations and displacements. Limited to two data sets. Discussed in Chapter 4.
- Renumber Data Set:**Allows you to change the existing order of data sets, eliminate gaps in numbering, etc. See Chapter 3.
- Transfer Data Set:**Allows you to store the data set under a different installation. You might use this if you accidentally imported data under the wrong installation. See Chapter 3.
- Settlement:**Allows you to enter settlement data and apply settlement corrections. See Chapter 5.
- Xpand Spiral:**This command appears when a spiral data set is selected. See Chapter 5 for details.

Data Set window

Installation	DATA SET	COMMANDS
Site SR18	Data Set # 1	Open Next
Installation # TM2	Reading Date 04/29/93	Quit/Return
Desc Slide at Tiger Mountain	Reading Time 09:38	-----
Date of Entry 03/08/93	Operator	Beginning
Usual Sensor No 1	Spiral Set? N	End
Shallowest Depth 2.0	Act1 Sensor # 1	Next
Deepest Depth 70.0	Act1 Cnst 20000	Previous
Reading Interval 2.0	Rot Corr A 0.0000	Jump To
A0 Direction	Rot Corr B 0.0000	List
Orientation 0.000	Zero Shift/Offset A 0	-----
Offset/Stickup 0.00	Zero Shift/Offset B 0	Add
	Full Set(Y/N) Y	Modify
	Number of Depths 35	Delete
		-----
		Write ASCII
		Compare
		Renumber Set
		Transfer Set
		Settlement
Data		

Make next window active

## Data Window

- Viewing Data
- 1 Type **O** for **Open Next** to open the Data window at the bottom of the screen. A single line of data appears.
  - 2 To see a list of readings, type **L** for **List**. Then use the PgUp and PgDn keys to view different depths.

### Data Window Commands

**Add, Modify and Delete:** These commands let you edit the data at the displayed depth.

**Validate Data:** Runs DU's validation routines (checksum statistics and zero-shift analysis).

Data window

<b>Installation</b> Site SR18 Installation # TM2 Desc Slide at Tiger Mountain Date of Entry 03/08/93 Usual Sensor No 1 Shallowest Depth 2.0 Deepest Depth 70.0 Reading Interval 2.0 A0 Direction Orientation 0.000 Offset/Stickup 0.00	<b>Data Set</b> Data Set # 1 Reading Date 04/29/93 Reading Time 09:38 Operator Spiral Set? N Act1 Sensor # 1 Act1 Cnst 20000 Rot Corr A 0.0000 Rot Corr B 0.0000 Zero Shift/Offset A 0 Zero Shift/Offset B 0 Full Set(Y/N) Y Number of Depths 35	<b>COMMANDS</b> Quit/Return Beginning End Next Previous Jump To Skip List Add Modify Delete Validate Data		
D A T A				
Depth 2.000	A0 -472	A180 479	B0 239	B180 -282

Leave current screen>Returns to Previous Screen

Data window showing list of readings

<b>Installation</b> Site SR18 Installation # TM2 Desc Slide at Tiger Date of Entry 03/08/93 Usual Sensor No 1 Shallowest Depth Deepest Depth 70.0 Reading Interval 2.0 A0 Direction Orientation 0.000 Offset/Stickup 0.0	<b>Data Set</b> Site: SR18 Installation: TM2 Rd Set: 1 <table border="1"> <thead> <tr> <th>Depth</th> <th>A0</th> <th>A180</th> <th>B0</th> <th>B180</th> </tr> </thead> <tbody> <tr><td>2.000</td><td>-472</td><td>479</td><td>239</td><td>-282</td></tr> <tr><td>4.000</td><td>-265</td><td>273</td><td>-17</td><td>-13</td></tr> <tr><td>6.000</td><td>330</td><td>-330</td><td>-202</td><td>162</td></tr> <tr><td>8.000</td><td>390</td><td>-383</td><td>-127</td><td>87</td></tr> <tr><td>10.000</td><td>294</td><td>-289</td><td>-212</td><td>163</td></tr> <tr><td>12.000</td><td>241</td><td>-231</td><td>-254</td><td>213</td></tr> <tr><td>14.000</td><td>166</td><td>-162</td><td>-297</td><td>265</td></tr> <tr><td>16.000</td><td>118</td><td>-111</td><td>-366</td><td>326</td></tr> <tr><td>18.000</td><td>54</td><td>-51</td><td>-433</td><td>385</td></tr> <tr><td>20.000</td><td>-7</td><td>12</td><td>-420</td><td>380</td></tr> <tr><td>22.000</td><td>73</td><td>-70</td><td>-499</td><td>451</td></tr> <tr><td>24.000</td><td>175</td><td>-165</td><td>-411</td><td>377</td></tr> <tr><td>26.000</td><td>242</td><td>-236</td><td>-433</td><td>384</td></tr> <tr><td>28.000</td><td>172</td><td>-164</td><td>-405</td><td>355</td></tr> <tr><td>30.000</td><td>91</td><td>-85</td><td>-418</td><td>399</td></tr> </tbody> </table>	Depth	A0	A180	B0	B180	2.000	-472	479	239	-282	4.000	-265	273	-17	-13	6.000	330	-330	-202	162	8.000	390	-383	-127	87	10.000	294	-289	-212	163	12.000	241	-231	-254	213	14.000	166	-162	-297	265	16.000	118	-111	-366	326	18.000	54	-51	-433	385	20.000	-7	12	-420	380	22.000	73	-70	-499	451	24.000	175	-165	-411	377	26.000	242	-236	-433	384	28.000	172	-164	-405	355	30.000	91	-85	-418	399	<b>Commands</b> return ing us o te Data 2
Depth	A0	A180	B0	B180																																																																														
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28.000	172	-164	-405	355																																																																														
30.000	91	-85	-418	399																																																																														

Display all records beginning with this record

**Notes**

***Importing Data***

**Notes**

**Data Formats** DU can import data from many different formats, including several spreadsheets, RPP, G-Tilt, PC-SLIN, Geokon, IDAGraph, and Campbell. DU also supports manual data entry.

**Importing Data from a Spreadsheet** DU can import data from spreadsheet files created by Lotus 1-2-3, Microsoft Excel, Borland Quattro Pro, and Lotus Symphony. DU uses the same database format as the DataMate Manager program and the Digi2 program.

**Task 1: Create a Project Database** Before you can import data, you must create a project database. If you want to import data to an existing database, select that database and skip to Task 3.

- 1** Start DU. If DU is already started, return to the Main Menu. Then press **D** (Database Selector).
- 2** When the Database Selection screen is displayed, type **F** to create a new database. DU activates the file field at the top of the screen.
- 3** Enter a name for the database (up to eight characters long) and press Enter. DU then creates the database in the DigiPro directory.

If you want to create the database in a different directory, type in a path along with the name. Include the .HDR extension with the name.

For example, to create a database called “mudmtn” in a directory called “data,” type **c:\data\mudmtn.hdr** and press Enter.

- 4** DU asks if you want to create the file. Type **Y**.
- 5** Go to Task 2.

**Task 2: Create a Sensor Record** A sensor record is required for each inclinometer probe or spiral sensor that you use. The procedure for setting up In-Place Inclinometer sensor records is slightly different from that for inclinometer probes. You will not create a sensor record for each sensor. One sensor record will be used for all the sensors in a string. Instead of entering a sensor serial number, enter a name (such as “INPLACE”) to identify the record. Enter this name as “Usual Sensor No” in the installation record.

- 1** At the Main Menu, type **S** (Sensor Info).
- 2** DU displays fields that define the sensor (probe). At the bottom of the screen, DU asks if you want to add records. Type **Y** or press Enter.
- 3** Enter the sensor serial number and press Enter.
- 4** Enter the sensor model number. This is for reference only and is not used in computations. The English probe is model number 50302500; the metric probe is 50302510. The English horizontal probe is 50302900, and the metric horizontal probe is 50302910.
- 5** DU asks if the probe is English. Type **Y** if you have an English probe. Type **N** if you have a metric probe.
- 6** Enter an instrument constant. This is used to calculate deviation. The constant for English probes is 20000. To accept this constant, just press Enter. If you have a metric probe, enter 25000 and press Enter.
- 7** Use the default values for rotation, zero-shift, and sensitivity. See Chapter 8 for a brief discussion of these fields.
- 8** When you are finished, press PgDn. At the bottom of the display, DU asks if you want to save the information. Type **Y**.
- 9** To return to the Main Menu, type **Q** or press Esc. To enter information for another sensor, type **A** (Add), then repeat steps 3 through 7.

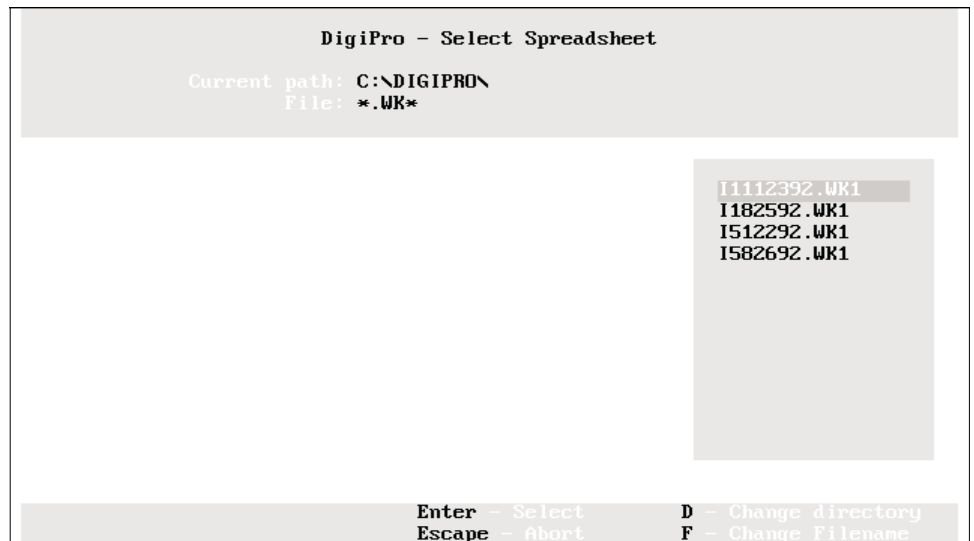
**Task 3: Create an Installation Record**

This task assumes that you want to create a new installation record. If you want to import data for an existing installation, go to Task 4.

- 1** At the Main Menu, type **M** (Maintain Data).
- 2** At the bottom of the screen, DU asks if you want to add records. Type **Y** or press Enter. DU then activates the installation window and places the cursor in the “Site” field.
- 3** Every installation record has two identifiers, “Site” and “Installation.” Enter up to six alphanumeric characters for each field. Suppose the site is named “MUDMTN.” You could use this name for all of the inclinometers installations at that site. Each installation could then be given a unique identifier, such as INCL1, INCL2, INCL3, etc. Normally, the date and year should not be used as identifiers, since data sets are time and date-stamped elsewhere.
- 4** For “Desc” enter a description up to 50 characters long.
- 5** Enter the date. This date indicates only when the installation record was entered into DU; it is not the date of the data set.
- 6** Enter the serial number of your probe and press Enter. If you can’t remember it, type **?** and press Enter.  
At the bottom of the display, DU prompts:  
**Sensor# not found in table: pick (Y/N).**  
Type **Y**. DU displays a list of sensors. Move the highlight bar to the probe you want and press Enter. DU copies the serial number to the installation record.
- 7** Enter the shallowest and deepest depths for the installation. (The shallowest depth is generally 2 feet or 0.5 meters.)  
Enter the reading interval, then press Enter. The standard interval is 2 feet for English systems and 0.5 meters for metric systems. Check your spread sheet if in doubt.
- 8** Enter the A0 Direction. This should be a compass heading or other identifier (up to three characters) for the A0 casing groove.
- 9** When you are finished, press PgDn. DU asks if you want to save the information. Type **Y**.

**Task 4: View the Spreadsheet** For this task, you can use either DU's spreadsheet viewer or your spreadsheet program. The purpose is to note the location of the data in the spreadsheet. DU needs this information in Task 5.

- 1** Return to the Main menu, then type **V** (View Spreadsheet).
- 2** DU displays a selection screen and shows the ".WK1" files that are in the DigiPro directory. Move the highlight bar to the file you want to view and press Enter.  
If your data is in another directory, type **C** (Change Directory).  
If you are using another program, type **F** (Change File), then type in a different file specification, such as **\*.WKS**.



	A	B	C	D	E	F
1	Project:	Miles	Road	Slope	Stability	Ins
2						
3		DEPTH (ft)	A0	A180	DIFF	B0
4		2.00	368.00	-388.00	-20.00	468.00
5		4.00	320.00	-336.00	-16.00	447.00
6		6.00	110.00	-127.00	-17.00	420.00
7		8.00	61.00	-77.00	-16.00	379.00
8		10.00	59.00	-79.00	-20.00	395.00
9		12.00	81.00	-100.00	-19.00	329.00
10		14.00	27.00	-47.00	-20.00	238.00
11		16.00	7.00	-26.00	-19.00	176.00
12		18.00	-9.00	-9.00	-18.00	120.00
13		20.00	26.00	-45.00	-19.00	113.00
14		22.00	87.00	-105.00	-18.00	110.00
15		24.00	92.00	-111.00	-19.00	24.00
16		26.00	127.00	-147.00	-20.00	-87.00
17		28.00	167.00	-184.00	-17.00	-209.00
18		30.00	202.00	-222.00	-20.00	-421.00

Viewing Lotus 2.x Spreadsheet: C:\DIGIPRO\11112392.WK1

**3** DU displays the spreadsheet that you selected. Use the arrow keys to move to different parts of the file. Press Home to go to the top of the spreadsheet and End to go to the bottom of the spreadsheet.

**4** Locate the data set that you want to import. Make a note of the columns for depths, A0 readings, A180 readings, B0 readings, and B180 readings and the beginning row and ending row for readings. If you were using the spreadsheet shown here, your notes might look like this:

Depths Column: B  
 A0 Column: C  
 A180 Column: D  
 B0 Column: F  
 B180 Column: G  
 Beginning Row: 4  
 End Row: 40

**5** Press Esc to close the viewer.

Task 5: Import the Spreadsheet Data

- 1** Return to the Main Menu, then type **M** (Maintain Data).
- 2** Select an installation: Type **N** (Next) until the installation is displayed. If there are many installations, use the List or Jump-To command.
- 3** Activate the Data Set Window: Type **O** (Open Next).
- 4** DigiPro automatically displays data set #1 for new installations. If the installation already has some data sets, type **A** (add) to display the next available data set. In either case, press Enter.
- 5** Enter the date of the survey. Enter the time if it is available. The default answers for the other fields are usually satisfactory. Press PgDn to accept your entries.
- 6** DU asks if you want to save the record. Type **Y**.  
DU asks if you want to import the data from a spreadsheet. Type **Y**. A selection screen appears. This is the same screen that you used with the spreadsheet viewer. Change directories or file mask, if necessary. Then move the highlight bar to the file you want and prese Enter.
- 7** At the bottom of the screen, DU prompts for the location of the data. Type in the locations that you noted earlier. Press Enter after each entry.
- 8** Press PgDn or Enter to start the import. As DU imports the data, it marks each column as “Done.”

Depths Column	<b>B</b>	B0 Column	<b>F</b>	Beginning Row	<b>4</b>
A0 Column	<b>C</b>	B180 Column	<b>G</b>	Ending Row	<b>40</b>
A180 Column	<b>D</b>				

When the import is finished, DU generates checksum statistics. If you want to view the statistics, continue with Task 6. If you want to quit, press Esc.

- Task 6: Validate the Data
- 1** At the start of the validation process, DU displays statistics for the entire survey. To quit now, press Esc.
  - 2** At the bottom of the screen, the program prompts for the number of readings per group. “10 readings” is already entered. Press Enter to see statistics for groups of readings.
  - 3** DU displays statistics for each group. If you want to quit, press Esc now.
  - 4** At the bottom of the screen, DU prompts for a group number. Enter the number of the group you want to inspect and press Enter. DU will display readings and checksums for the depths in that group.
  - 5** When you are finished, press Esc to return to the Data Window.

"Performance Test for Entire Data Set" screen

PERFORMANCE TEST FOR ENTIRE DATASET				
+--- A Checksum ---+		+--- B Checksum ---+		
MEAN	STD.DEV.	MEAN	STD.DEV.	
-18.9	2.2	-3.9	3.7	93

Date of Entry 06/02/93	Operator
Usual Sensor No 1	Spiral Set?
Shallowest Depth 2.0	Act1 Sensor # 1
Deepest Depth 68.0	Act1 Cnst 20000
Reading Interval 2.0	Rot Corr A 0.0000
A0 Direction	Rot Corr B 0.0000
Orientation 0.000	Zero Shift/Offset A 0
Offset/Stickup 0.00	Zero Shift/Offset B 0
	Full Set(Y/N) Y
	Number of Depths 36

D A T A				
Depth	A0	A180	B0	B180

Enter # of readings/group or ESC to quit 10  
Perform Breakdown Analysis

Group statistics

PERFORMANCE TEST FOR ENTIRE DATASET						
+--- A Checksum ---+		+--- B Checksum ---+				
MEAN	STD.DEV.	MEAN	STD.DEV.			
-18.9	2.2	-3.9	3.7			93

PERFORMANCE TEST BY GROUP						
Grp #	Depth Range	+--- A Checksum ---+		+--- B Checksum ---+		
		Mean	Std.Dev	Mean	Std.Dev	
1	4.0 to 22.0	-18.2	1.4	-4.7	4.5	
2	24.0 to 42.0	-18.5	2.4	-4.4	2.7	
3	44.0 to 62.0	-19.6	2.4	-2.3	1.5	
4	64.0 to 72.0	-18.8	2.0	-2.5	1.0	

Enter the group number to examine or Esc to Quit 1

Readings

PERFORMANCE TEST FOR ENTIRE DATASET								
+--- A Checksum ---+			+--- B Checksum ---+					
MEAN	STD.DEV.		MEAN	STD.DEV.				
-18.9	2.2		-3.9	3.7		93		

Depth	A0	A180	Sum	CS Dev	B0	B180	Sum	CS Dev
4.0	320	-336	-16	2.2	447	-463	-16	-11.3
6.0	110	-127	-17	1.2	420	-422	-2	2.7
8.0	61	-77	-16	2.2	379	-386	-7	-2.3
10.0	59	-79	-20	-1.8	395	-397	-2	2.7
12.0	81	-100	-19	-0.8	329	-335	-6	-1.3
14.0	27	-47	-20	-1.8	238	-238	0	4.7
16.0	7	-26	-19	-0.8	176	-177	-1	3.7
18.0	-9	-9	-18	0.2	120	-127	-7	-2.3
20.0	26	-45	-19	-0.8	113	-114	-1	3.7
22.0	87	-105	-18	0.2	110	-115	-5	-0.3

GROUP 1 VALUES Mean A=-18.2 B=-4.7 Std Dev A=1.4 B=4.5

## Importing Data from RPP Files

The RPP generates one file per data set. Each file has a “header” that contains information about the installation and the data set. When DU imports a file, it uses this information to create a sensor record, an installation record, and a data set record.

### RPP Header Information

#### Installation Records

<i>This RPP field:</i>	<i>becomes this DigiPro field:</i>	<i>Comments</i>
Project	Site	Uses first 6 characters
Hole #	Installation	Uses first 6 characters
Job Desc	Desc	
Dir Code	A0 Direction	

### Task 1: Create a Project Database

Before you can import data, you must create a project database. If you want to import data to an existing database, select that database and skip to Task 2.

- 1** Start DU. If DU is already started, return to the Main Menu. Then press **D** (Database Selector).
- 2** When the Database Selection screen is displayed, type **F** to create a new database. DU activates the file field at the top of the screen.
- 3** Enter a name for the database (up to eight characters long) and press Enter. DU then creates the database in the DigiPro directory.  
 If you want to create the database in a different directory, type in a path along with the name. Include the .HDR extension with the name.  
 For example, to create a database called “mudmtn” in a directory called “data,” type **c:\data\mudmtn.hdr** and press Enter.
- 4** DU asks if you want to create the file. Type **Y**.
- 5** Go to Task 2.

- Task 2: Importing the Data
- 1** At the Main Menu, type **I** (Import Data File).
  - 2** DU prompts for the type of file to import. Type **R** to select RPP files.
  - 3** DU prompts for a file. Enter the path and the file name and press Enter. If you prefer, type in a path and a “wildcard” specification such as \*.\*. DU displays a list of files. Move the highlight bar to the one you want and press Enter.
  - 4** DU displays the RPP file header and asks you to confirm that the file is the correct data set. Press Enter to confirm or **N** to start over.
  - 5** DU checks for duplicate installation IDs and data set numbers, reads the file into the project database, displays a message indicating the file was loaded, and then returns to the Main Menu.
- Import Error
- 1** If DU detects a duplicate installation and data set in the database, it asks if you want to change the data set number and continue. Type **N** to start over or **Y** to continue.
  - 2** If you type **Y**, DU asks if you want to display existing data set headers. Type **N** to continue or **Y** to view existing data set numbers.
  - 3** Press Esc when you are finished viewing the headers.
  - 4** DU prompts you to enter a new data set number. When you enter a new number and press Enter, DU reads in the file.

## Importing Data from G-Tilt Files

G-Tilt combines a “header” with multiple data sets in a single file. DU uses this information to generate an installation record, a sensor record, and multiple data set records.

If the files were “tagged” in G-Tilt, DU preserves the tag in the project database. When you create a graph with DigiPro, just click on “Recall” to load the same data sets that you were using with G-Tilt.

The first data set in a G-Tilt file is a “dummy” set. After you import the data, delete this data set. You can then use DU’s “Renumber Set” command to restore the data set numbers as they were in G-Tilt.

### G-Tilt Header Information

#### Installation Records

<i>This G-Tilt field:</i>	<i>becomes this DigiPro field:</i>	<i>Comments</i>
Project	Site	Uses first 6 characters
Installation No.	Installation	Uses first 6 characters
Location	Desc	
Shallowest depth	Shallowest depth	
English/Metric sensor		DigiPro converts G-Tilt sensor data and output data to appropriate instrument constant and reading interval
English/Metric output units		
Stickup		
Elevation		DigiPro does not use these G-Tilt fields
Skew angle		
Finish time		

#### Data Sets

(order of data sets in file)	Data Set #	
Date	Date	Converted to MM/DD/YY
Start Time	Reading Time	

### Task 1: Create a Project Database

Before you can import data, you must create a project database. If you want to import data to an existing database, select that database and skip to Task 2.

- 1** Start DU. If DU is already started, return to the Main Menu. Then press **D** (Database Selector).
- 2** When the Database Selection screen is displayed, type **F** to create a new database. DU activates the file field at the top of the screen.

- 3** Enter a name for the database (up to eight characters long) and press Enter. DU then creates the database in the DigiPro directory.

If you want to create the database in a different directory, type in a path along with the name. Include the .HDR extension with the name.

For example, to create a database called “mudmtn” in a directory called “data,” type **c:\data\mudmtn.hdr** and press Enter.

- 4** DU asks if you want to create the file. Type **Y**.

- 5** Go to Task 2.

#### Task 2: Import the G-Tilt Data

- 1** At the Main Menu, Type **I** (Import Data File).

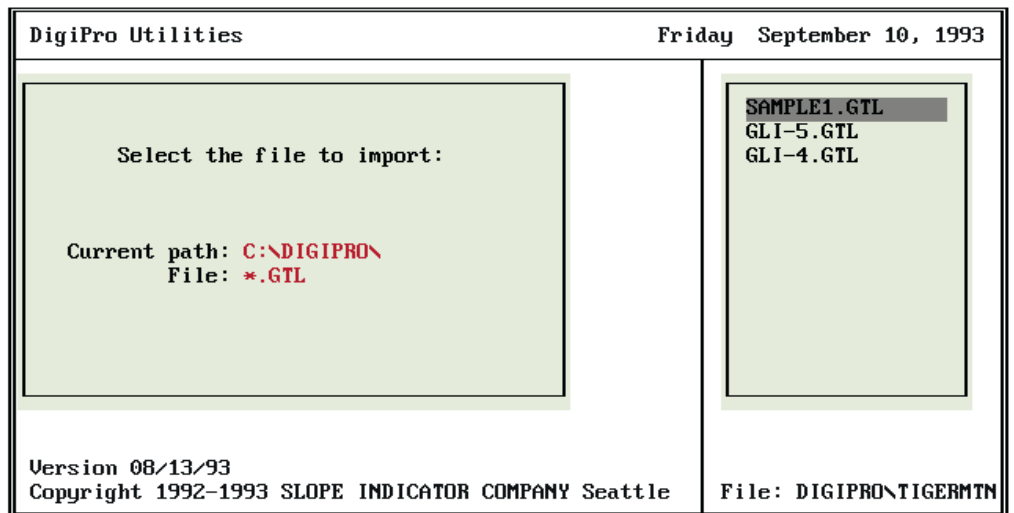
- 2** DU prompts for the type of file to import. Type **G**. A selection screen appears, listing all files in the DigiPro directory that have a “.GTL” extension. Move the highlight bar to the file you want and press Enter.

If your G-tilt files are in a different directory, type **D** to activate the Current Path field. Enter the path to your files and press Enter.

- 3** DU displays the file header and asks you to confirm that the file is the correct one. Press **Y** to confirm.

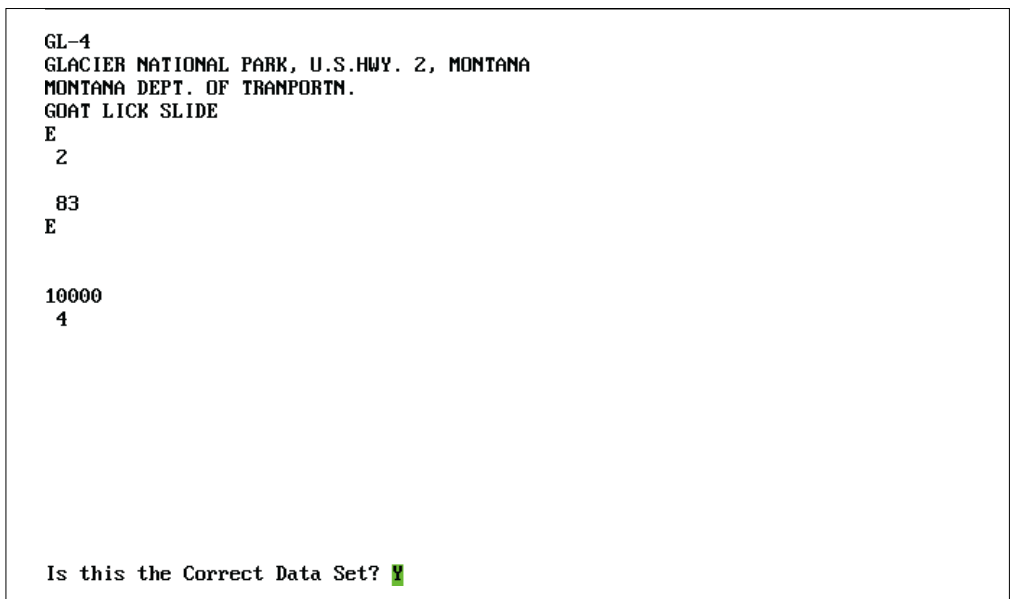
- 4** DU reads the file into the project database and displays a message indicating the file was loaded. Press any key to return to the Main Menu.

- 5** (Optional) Renumber the data sets. See Chapter 3.



D - Change drive/path      Enter - Continue  
 F - Change file            Escape - Abort

G-Tilt file-selection screen



G-Tilt file header

## Importing Data from PC-SLIN Files

PC-SLIN files are generated by PC-SLIN and Slope Indicator's DigiPC and DigiPsion programs. Each PC-SLIN file contains a header and one data set. With this information, DU creates a sensor record, an installation record, and a data set record.

### PC-SLIN Header Information

#### Installation Records

<i>This PCSLIN field:</i>	<i>becomes this DigiPro field:</i>	<i>Comments</i>
Project No	Site	Uses first 6 characters
Hole No	Installation	Uses first 6 characters
Text below "project no"	Desc	
A+CompassDirection	A0 Direction	

#### Data Sets

Reading Set No	Data Set #	
Date	Date	Converted to MM/DD/YY

### Task 1: Create a Project Database

Before you can import data, you must create a project database. If you want to import data to an existing database, select that database and skip to Task 2.

- 1** Start DU. If DU is already started, return to the Main Menu. Then press **D** (Database Selector).
- 2** When the Database Selection screen is displayed, type **F** to create a new database. DU activates the file field at the top of the screen.
- 3** Enter a name for the database (up to eight characters long) and press Enter. DU then creates the database in the DigiPro directory.  
If you want to create the database in a different directory, type in a path along with the name. Include the .HDR extension with the name.  
For example, to create a database called "mudmtn" in a directory called "data," type **c:\data\mudmtn.hdr** and press Enter.
- 4** DU asks if you want to create the file. Type **Y**.
- 5** Go to Task 2.

- Task 2: Import the Data
- 1** At the Main Menu, type I (Import Data).
  - 2** DU prompts for the type of data to import. Type **P**.
  - 3** DU prompts for a file name. Type in the path and file name and press Enter. If you prefer, type in a path and a “wildcard” specification such as \*.\*. DU displays a list of files. Move the highlight bar to the one you want and press Enter.
  - 4** DU displays the file header and asks you to confirm that the file is the correct data set. Press Enter to confirm.
  - 5** DU reads the file into the project database, displays a message indicating the file was loaded, and then returns to the Main Menu.

- Import Error
- 1** If DU detects a duplicate installation and data set in the database, it asks if you want to change the data set number and continue. Type **N** to start over or **Y** to continue.
  - 2** If you type **Y**, DU asks if you want to display existing data set headers. Type **N** to continue or **Y** to view existing data set numbers.
  - 3** Press Esc when you are finished viewing the headers.
  - 4** DU prompts you to enter a new data set number. When you enter a new number and press Enter, DU reads in the file.

## Importing Data from Geokon Files

Each Geokon file contains a header and a data set. When DU imports a file, it uses the information in the header to create a sensor record, an installation record, and a data set record.

### Task 1: Create a Project Database

Before you can import data, you must create a project database. If you want to import data to an existing database, select that database and skip to Task 2.

- 1** Start DU. If DU is already started, return to the Main Menu. Then press **D** (Database Selector).
- 2** When the Database Selection screen is displayed, type **F** to create a new database. DU activates the file field at the top of the screen.
- 3** Enter a name for the database (up to eight characters long) and press Enter. DU then creates the database in the DigiPro directory.  
If you want to create the database in a different directory, type in a path along with the name. Include the .HDR extension with the name.  
For example, to create a database called “mudmtn” in a directory called “data,” type **c:\data\mudmtn.hdr** and press Enter.
- 4** DU asks if you want to create the file. Type **Y**.
- 5** Go to Task 2.

- Task 2: Importing the Data
- 1** At the Main Menu, type **I** (Import Data File).
  - 2** DU prompts for the type of file to import. Select Geokon File Import.
  - 3** DU prompts for a file. Enter the path and the file name and press Enter. If you prefer, type in a path and a “wildcard” specification such as \*.\*. DU displays a list of files. Move the highlight bar to the one you want and press Enter.
  - 4** DU displays the file header and asks you to confirm that the file is the correct data set. Press Enter to confirm or **N** to start over.
  - 5** DU checks for duplicate installation IDs and data set numbers, reads the file into the project database, and displays a message indicating the file was loaded. Press any key to return to the Main Menu.

## Importing Data from IDAGraph Format

IDAGraph format is used by the IDA DataMate and the VS DataMate, as well as the IDAGraph program. The following steps describe how to import IDAGraph data into a DigiPro database.

- Overview
- 1** Create a new database or use an existing one.
  - 2** Create a sensor record or use an existing one.
  - 3** Create an installation record or use an existing one.
  - 4** Set import parameters and import data.

### Task 1: Create a Project Database

Before you can import data, you must create a project database. If you want to import data into an existing database, select that database and skip to Task 2.

- 1** Start DU. If DU is already started, return to the Main Menu. Then press **D** (Database Selector).
- 2** When the Database Selection screen is displayed, type **F** to create a new database. DU activates the file field at the top of the screen.
- 3** Enter a name for the database (up to eight characters long) and press Enter. DU then creates the database in the DigiPro directory.  
If you want to create the database in a different directory, type in a path along with the name. Include the .HDR extension with the name.  
For example, to create a database called “mudmtn” in a directory called “data,” type **c:\data\mudmtn.hdr** and press Enter.
- 4** DU asks if you want to create the file. Type **Y**.
- 5** Go to Task 2.

**Task 2: Create a Sensor Record** A sensor record is required for each inclinometer probe or spiral sensor that you use. The procedure for setting up In-Place Inclinometer sensor records is slightly different from that for inclinometer probes. You will not create a sensor record for each individual sensor. One sensor record will be used for all the sensors in a string. Instead of entering a sensor serial number, enter a name (such as "INPLACE") to identify the record. Enter this name as "Usual Sensor No" in the installation record.

- 1** At the Main Menu, type **S** (Sensor Info).
- 2** DU displays fields that define the sensor (probe). At the bottom of the screen, DU asks if you want to add records. Type **Y** or press Enter.
- 3** Enter the sensor serial number and press Enter.
- 4** Enter the sensor model number. This is for reference only and is not used in computations.
- 5** DU asks if the probe is English. Type **Y** if you have an English probe. Type **N** if you have a metric probe.
- 6** Enter an instrument constant. This is used to calculate deviation. The constant for English probes is 20000. To accept this constant, just press Enter. If you have a metric probe, enter 25000 and press Enter.
- 7** Use the default values for rotation, zero-shift, and sensitivity. See Chapter 8 for a brief discussion of these fields.
- 8** When you are finished, press PgDn. At the bottom of the display, DU asks if you want to save the information. Type **Y**.
- 9** To return to the Main Menu, type **Q** or press Esc. To enter information for another sensor, type **A** (add), then repeat steps 3 through 7.

Task 3: Create an Installation Record

- 1** At the Main Menu, type **M** (Maintain Data).
- 2** At the bottom of the screen, DU asks if you want to add records. Type **Y** or press Enter. DU then activates the installation window and places the cursor in the “Site” field.
- 3** Every installation record has two identifiers, “Site” and “Installation.” Enter up to six alphanumeric characters for each field. Suppose the site is named “MUDMTN.” You could use this name for all of the inclinometers installations at that site. Each installation could then be given a unique identifier, such as INCL1, INCL2, INCL3, etc. Normally, the date and year should not be used as identifiers, since data sets are time and date-stamped elsewhere.
- 4** For “Desc” enter a description up to 50 characters long. Enter the date. This date indicates only when the installation record was entered into DU; it is not the date of the data set.
- 5** Enter the serial number of your probe and press Enter. If you can’t remember it, type **?** and press Enter.  
At the bottom of the display, DU prompts:  
**Sensor# not found in table: pick (Y/N).**  
Type **Y** for a list of sensors, then move the highlight bar to the probe you want and press Enter. DU copies the serial number to the installation record.
- 6** Enter the shallowest depth for the installation. Then press Enter. (The shallowest depth is generally 2 feet or 0.5 meters.)
- 7** Enter the deepest depth for the installation, then press Enter. Enter the reading interval, then press Enter. The standard interval is 2 feet for English systems and 0.5 meters for metric systems.
- 8** Enter A0 Direction. This should be a compass heading or other identifier (up to three characters) for the A0 casing groove.
- 9** When you are finished, press PgDn. DU asks if you want to save the information. Type **Y**.  
To enter another installation record, type **A** (Add) and repeat the process. When you are finished, type **Q** (quit) to return to the Main Menu.

**Task 4: Set Import Parameters**

- 1** When you are done with the Installation screen, select “Open Next” to open the Data Set screen.
- 2** If the installation is new, DU will automatically add the first data set. If there are other data sets in the installation, type **A** to Add a new data set.
- 3** Press PgDn and **Y** to save the data set. Select “Open Next.” The “Select Data Source” window pops up. Select “IDAGraph Import.”
- 4** Select the .CHL file for your installation. This file contains a list of sensors.
- 5** DU displays the list of sensors. Press **M** to Modify the list. Each sensor that will be imported is marked with a diamond. Press the space bar to mark or unmark the highlighted sensor. Press Enter when the sensors are marked appropriately. Press **T** to toggle the axis of the highlighted sensor between A and B, or Enter to change its depth. Press Esc to continue when all settings are correct.
- 6** Select a beginning and end date and time. If you have imported data from this file before, DU will automatically set the beginning date and time to the previous end date and time. If this is the first data set imported, DU will use the first date and time in the file. DU will use the last date and time in the file for the end date and time. Reset these values as needed.
- 7** Select an import method. DU can average all the readings for each sensor within the time period, select the first reading in the time period, or select the last reading in the time period.
- 8** Leave the conversion factor at 1.0. It is used only if the data logger is converting data to engineering units.

- Import Data
- 1** Press PgDn or Return. DU completes the import and automatically fills in the Date, Time, Operator, Full Set, and Number of Depths fields for the data set. “Date” and “Time” are set to the end date and time specified during the import process. “Operator” is “IDAIMPORTX” where X is a one-letter code indicating the import method: **A**verage, **F**irst, or **L**ast. “Full Set” is automatically set to “N,” indicating that there are no 180 $\supset$  readings in the data set.
  - 2** Press **L** to List the data or select “Quit/Return” to return to the Data Set window. From the Data Set window, press **A** if you wish to Add a new data set.
  - 3** Repeat this procedure for each data set that you wish to import.

## Importing Campbell Data

- Overview
- 1** Create a new database or use an existing one.
  - 2** Create a sensor record or use an existing one.
  - 3** Create an installation record or use an existing one.
  - 4** Set import parameters and import data.

### Task 1: Create a Project Database

Before you can enter data, you must create a project database. If you want to enter data in an existing database, select that database and skip to Task 2.

- 1** Start DU. If DU is already started, return to the Main Menu. Then press **D** (Database Selector).
- 2** When the Database Selection screen is displayed, type **F** to create a new database. DU activates the file field at the top of the screen.
- 3** Enter a name for the database (up to eight characters long) and press Enter. DU then creates the database in the DigiPro directory.  
If you want to create the database in a different directory, type in a path along with the name. Include the .HDR extension with the name.
- 4** DU asks if you want to create the file. Type **Y**.
- 5** Go to Task 2.

**Task 2: Create a Sensor Record** A sensor record is required for each inclinometer probe or spiral sensor that you use. The procedure for setting up In-Place Inclinometer sensor records is slightly different from that for inclinometer probes. You will not create a sensor record for each individual sensor. One sensor record will be used for all the sensors in a string. Instead of entering a sensor serial number, enter a name (such as "INPLACE") to identify the record. Enter this name as "Usual Sensor No" in the installation record.

- 1** At the Main Menu, type **S** (Sensor Info).
- 2** DU displays fields that define the sensor (probe). At the bottom of the screen, DU asks if you want to add records. Type **Y** or press Enter.
- 3** Enter the sensor serial number and press Enter.
- 4** Enter the sensor model number. This is for reference only and is not used in computations.
- 5** DU asks if the probe is English. Type **Y** if you have an English probe. Type **N** if you have a metric probe.
- 6** Enter an instrument constant. This is used to calculate deviation. The constant for English probes is 20000. To accept this constant, just press Enter. If you have a metric probe, enter 25000 and press Enter.
- 7** Use the default values for rotation, zero-shift, and sensitivity. See Chapter 8 for a brief discussion of these fields.
- 8** When you are finished, press PgDn. At the bottom of the display, DU asks if you want to save the information. Type **Y**.
- 9** To return to the Main Menu, type **Q** or press Esc. To enter information for another sensor, type **A** (add), then repeat steps 3 through 7.

- Task 3: Create an Installation Record
- 1** At the Main Menu, type **M** (Maintain Data).
  - 2** At the bottom of the screen, DU asks if you want to add records. Type **Y** or press Enter. DU then activates the installation window and places the cursor in the “Site” field.
  - 3** Every installation record has two identifiers, “Site” and “Installation.” Enter up to six alphanumeric characters for each field. Suppose the site is named “MUDMTN.” You could use this name for all of the inclinometers installations at that site. Each installation could then be given a unique identifier, such as INCL1, INCL2, INCL3, etc. Normally, the date and year should not be used as identifiers, since data sets are time and date-stamped elsewhere.
  - 4** For “Desc” enter a description up to 50 characters long. Enter the date. This date indicates only when the installation record was entered into DU; it is not the date of the data set.
  - 5** Enter the serial number of your probe and press Enter. If you can’t remember it, type **?** and press Enter.  
At the bottom of the display, DU prompts:  
**Sensor# not found in table: pick (Y/N).**  
Type **Y** for a list of sensors, then move the highlight bar to the probe you want and press Enter. DU copies the serial number to the installation record.
  - 6** Enter the shallowest depth for the installation. Then press Enter. (The shallowest depth is generally 2 feet or 0.5 meters.)
  - 7** Enter the deepest depth for the installation, then press Enter. Enter the reading interval, then press Enter. The standard interval is 2 feet for English systems and 0.5 meters for metric systems.
  - 8** Enter A0 Direction. This should be a compass heading or other identifier (up to three characters) for the A0 casing groove.
  - 9** When you are finished, press PgDn. DU asks if you want to save the information. Type **Y**.  
To enter another installation record, type **A** (Add) and repeat the process. When you are finished, type **Q** (quit) to return to the Main Menu.

Task 4: Format Campbell Data

- 1** When you are done with the Installation screen, select “Open Next” to open the Data Set screen.
- 2** If the installation is new, DU will automatically add the first data set. If there are other data sets in the installation, type **A** to Add a new data set.
- 3** Press PgDn and **Y** to save the data set. Select “Open Next.” The “Select Data Source” window pops up. Select “Campbell Import.”
- 4** Select the .DAT file for your installation. This file contains the Campbell data. Do not select a DigiPro .DAT file.
- 5** DU asks for an Identifier. Enter the Output Array ID.  
DU displays the first three lines of data for that Array ID. It automatically labels the first four fields as ID, Year, Julian, and Time. The rest of the fields are set to “OFF”.
- 6** Move the highlight bar to each field that you wish to import and press Enter to edit the label.
- 7** Enter a unique name for each sensor. Relabel the first four fields if necessary.
- 8** Press Esc to continue. Enter another Array ID if you wish to import more data from the same file.

- Set Import Parameters
- 1** DU displays the list of sensors. Press **M** to Modify the list. Each sensor that will be imported is marked with a diamond. Press the space bar to mark or unmark the highlighted sensor. Press Enter when the sensors are marked appropriately.
  - 2** Press **T** to toggle the axis of the highlighted sensor between A and B, or Enter to change its depth. Press Esc to continue when all settings are correct.
  - 3** Select a beginning and end date and time. If you have imported data from this file before, DU will automatically set the beginning date and time to the previous end date and time. If this is the first data set imported, DU will use the first date and time in the file. DU will use the last date and time in the file for the end date and time. Reset these values as needed.
  - 4** Select an import method. DU can average all the readings for each sensor within the time period, select the first reading in the time period, or select the last reading in the time period.
  - 5** DigiPro works only in whole numbers, with no decimals. The conversion factor is used to multiply original data. Enter a conversion factor that is appropriate for the scale of your data.
- Import Data
- 1** Press PgDn or Enter. DU completes the import and automatically fills in the Date, Time, Operator, Full Set, and Number of Depths fields for the data set. “Date” and “Time” are set to the end date and time specified during the import process.
  - 2** Press **L** to List the data or select “Quit/Return” to return to the Data Set window. From the Data Set window, press **A** if you wish to Add a new data set.
  - 3** Repeat this procedure for each data set that you wish to import.

## Manual Data Entry

- Overview
- 1** Create a new database or use an existing one.
  - 2** Create a sensor record or use an existing one.
  - 3** Create an installation record or use an existing one.
  - 4** Enter data sets and data for each installation.

### Task 1: Create a Project Database

Before you can enter data, you must create a project database. If you want to enter data in an existing database, select that database and skip to Task 2.

- 1** Start DU. If DU is already started, return to the Main Menu. Then press **D** (Database Selector).
- 2** When the Database Selection screen is displayed, type **F** to create a new database. DU activates the file field at the top of the screen.
- 3** Enter a name for the database (up to eight characters long) and press Enter. DU then creates the database in the DigiPro directory.  
If you want to create the database in a different directory, type in a path along with the name. Include the .HDR extension with the name.  
For example, to create a database called “mudmtn” in a directory called “data,” type **c:\data\mudmtn.hdr** and press Enter.
- 4** DU asks if you want to create the file. Type **Y**.
- 5** Go to Task 2.

**Task 2: Create a Sensor Record** A sensor record is required for each inclinometer probe or spiral sensor that you use.

- 1** At the Main Menu, type **S** (Sensor Info).
- 2** DU displays fields that define the sensor (probe). At the bottom of the screen, DU asks if you want to add records. Type **Y** or press Enter.
- 3** Enter the sensor serial number and press Enter.
- 4** Enter the sensor model number. This is for reference only and is not used in computations. The English probe is model number 50302500; the metric probe is 50302510. The English horizontal probe is 50302900, and the metric horizontal probe is 50302910.
- 5** DU asks if the probe is English. Type **Y** if you have an English probe. Type **N** if you have a metric probe.
- 6** Enter an instrument constant. This is used to calculate deviation. The constant for English probes is 20000. To accept this constant, just press Enter. If you have a metric probe, enter 25000 and press Enter.
- 7** Use the default values for rotation, zero-shift, and sensitivity. See Chapter 8 for a brief discussion of these fields.
- 8** When you are finished, press PgDn. At the bottom of the display, DU asks if you want to save the information. Type **Y**.
- 9** To return to the Main Menu, type **Q** or press Esc. To enter information for another sensor, type **A** (add), then repeat steps 3 through 7.

- Task 3: Create an Installation Record
- 1** At the Main Menu, type **M** (Maintain Data).
  - 2** At the bottom of the screen, DU asks if you want to add records. Type **Y** or press Enter. DU then activates the installation window and places the cursor in the “Site” field.
  - 3** Every installation record has two identifiers, “Site” and “Installation.” Enter up to six alphanumeric characters for each field. Suppose the site is named “MUDMTN.” You could use this name for all of the inclinometers installations at that site. Each installation could then be given a unique identifier, such as INCL1, INCL2, INCL3, etc. Normally, the date and year should not be used as identifiers, since data sets are time and date-stamped elsewhere.
  - 4** For “Desc” enter a description up to 50 characters long.
  - 5** Enter the date. This date indicates only when the installation record was entered into DU; it is not the date of the data set.
  - 6** Enter the serial number of your probe and press Enter. If you can’t remember it, type **?** and press Enter.  
At the bottom of the display, DU prompts:  
**Sensor# not found in table: pick (Y/N).**  
Type **Y** for a list of sensors, then move the highlight bar to the probe you want and press Enter. DU copies the serial number to the installation record.
  - 7** Enter the shallowest depth for the installation. Then press Enter. (The shallowest depth is generally 2 feet or 0.5 meters.)  
Enter the deepest depth for the installation, then press Enter.  
Enter the reading interval, then press Enter. The standard interval is 2 feet for English systems and 0.5 meters for metric systems. Check your spread sheet if in doubt.
  - 8** Enter A0 Direction. This should be a compass heading or other identifier (up to three characters) for the A0 casing groove.
  - 9** When you are finished, press PgDn. DU asks if you want to save the information. Type **Y**.  
To enter another installation record, type **A** (Add) and repeat the process. When you are finished, type **Q** (quit) to return to the Main Menu.

- Task 4: Enter a Data Set Record
- 1** Activate the Data Set Window: Type **O** (Open Next).
  - 2** DigiPro automatically displays data set #1 for new installations. If the installation already has some data sets, type **A** (add) to display the next available data set. In either case, press Enter.
  - 3** Enter appropriate values for the following fields. Press Enter after each entry.
    - Reading Date: Enter the date of the survey.
    - Reading Time: Enter this, if available.
    - Operator: Enter operator's initials, if available.
    - Spiral Set: The default value is "N." Enter **Y** if you are entering a spiral set.
    - Actl Sensor: The default is taken from the installation record. Change this only if you are using a different probe.
    - Actl Cnst: Enter 25000 for metric or 20000 for English probe.
    - Rotation & Zero-Shift: The default values for these (zero) is usually satisfactory. See Chapter 8 for a brief discussion.
    - Full Set (Y/N): The default is "Y." If only half of the set is available (e.g. A180 and B180 data are missing), enter **N**.
    - Number of Depths: DU will fill this field later.
  - 4** Press PgDn to accept your entries. DU asks if you want to save the record. Type **Y**.
  - 5** DU asks if you want to import the data from a spreadsheet. Type **N**.
  - 6** DU asks if you want to start your entries from the bottom of the data set. If you type **Y**, DU displays the deepest depth. If you type **N**, DU displays the shallowest depth.
  - 7** Go to Task 5.

**Task 5: Enter the Data** **1** DU displays a depth (either the deepest or the shallowest depth, depending on your answer in the step above). Enter the A0, A180, B0, and B180 readings for that depth. Press Enter after each entry.

When you reach the end of a line, DU displays the next depth. Continue entering depths. When the last value has been entered, DU calculates and displays checksum statistics.

**2** Press Esc to return to the Data window, or go to task 6.

*Data window*

<p>Installation</p> <p>Site DEMO</p> <p>Installation # INCL1</p> <p>Desc SW corner</p> <p>Date of Entry 10/27/93</p> <p>Usual Sensor No 3</p> <p>Shallowest Depth 2.0</p> <p>Deepest Depth 72.0</p> <p>Reading Interval 2.0</p> <p>A0 Direction NNW</p> <p>Orientat on 0.000</p> <p>Offset/Stickup 0.00</p>	<p>Data Set</p> <p>Data Set # 1</p> <p>Reading Date 10/27/93</p> <p>Reading Time 14:01</p> <p>Operator</p> <p>Spiral Set? Y</p> <p>Act1 Sensor # 3</p> <p>Act1 Cnst 20000</p> <p>Rot Corr A 0.0000</p> <p>Rot Corr B 0.0000</p> <p>Zero Shift/Offset A 0</p> <p>Zero Shift/Offset B 0</p> <p>Full Set(Y/N) Y</p> <p>Number of Depths 36</p>	<p>Commands</p> <p>Open Next</p> <p>Quit/Return</p> <hr/> <p>Beginning</p> <p>End</p> <p>Next</p> <p>Previous</p> <p>Jump To</p> <p>List</p> <hr/> <p>Add</p> <p>Modify</p> <p>Delete</p> <hr/> <p>Write ASCII</p>
<p>D A T A</p>		
<p>Depth 72.000 A0 0 A180 0 B0 0 B180 0</p>		

Press Esc to Exit

- Task 6: Validate the Data
- 1** At the start of the validation process, DU displays statistics for the entire survey. To quit now, press Esc.
  - 2** At the bottom of the screen, the program prompts for the number of readings per group. “10 readings” is already entered. Press Enter to see statistics for groups of readings.
  - 3** DU displays statistics for each group. If you want to quit, press Esc now.
  - 4** At the bottom of the screen, DU prompts for a group number. Enter the number of the group you want to inspect and press Enter. DU will display readings and checksums for the depths in that group.
  - 5** When you are finished, press Esc to return to the Data Window.

"Performance Test for Entire Data Set" screen

PERFORMANCE TEST FOR ENTIRE DATASET				
+--- A Checksum ---+		+--- B Checksum ---+		
MEAN	STD.DEV.	MEAN	STD.DEV.	
-18.9	2.2	-3.9	3.7	93

Date of Entry	06/02/93	Operator	
Usual Sensor No	1	Spiral Set?	N
Shallowest Depth	2.0	Act1 Sensor #	1
Deepest Depth	68.0	Act1 Cnst	20000
Reading Interval	2.0	Rot Corr A	0.0000
A0 Direction		Rot Corr B	0.0000
Orientation	0.000	Zero Shift/Offset A	0
Offset/Stickup	0.00	Zero Shift/Offset B	0
		Full Set(Y/N)	Y
		Number of Depths	36

D A T A				
Depth	A0	A180	B0	B180

Enter # of readings/group or ESC to quit **10**  
Perform Breakdown Analysis

Group statistics

PERFORMANCE TEST FOR ENTIRE DATASET						
+--- A Checksum ---+			+--- B Checksum ---+			
MEAN	STD.DEV.	MEAN	STD.DEV.			
-18.9	2.2	-3.9	3.7			93

PERFORMANCE TEST BY GROUP						
Grp #	Depth Range	Mean	Std.Dev	Mean	Std.Dev	
1	4.0 to 22.0	-18.2	1.4	-4.7	4.5	
2	24.0 to 42.0	-18.5	2.4	-4.4	2.7	
3	44.0 to 62.0	-19.6	2.4	-2.3	1.5	
4	64.0 to 72.0	-18.8	2.0	-2.5	1.0	

Enter the group number to examine or Esc to Quit **1**

Readings

PERFORMANCE TEST FOR ENTIRE DATASET								
+--- A Checksum ---+				+--- B Checksum ---+				
MEAN	STD.DEV.	MEAN	STD.DEV.					
-18.9	2.2	-3.9	3.7					93

Depth	A0	A180	Sum	CS Dev	B0	B180	Sum	CS Dev
4.0	320	-336	-16	2.2	447	-463	-16	-11.3
6.0	110	-127	-17	1.2	420	-422	-2	2.7
8.0	61	-77	-16	2.2	379	-386	-7	-2.3
10.0	59	-79	-20	-1.8	395	-397	-2	2.7
12.0	81	-100	-19	-0.8	329	-335	-6	-1.3
14.0	27	-47	-20	-1.8	238	-238	0	4.7
16.0	7	-26	-19	-0.8	176	-177	-1	3.7
18.0	-9	-9	-18	0.2	120	-127	-7	-2.3
20.0	26	-45	-19	-0.8	113	-114	-1	3.7
22.0	87	-105	-18	0.2	110	-115	-5	-0.3

GROUP 1 VALUES    Mean    A=-18.2    B=-4.7    Std Dev    A=1.4    B=4.5

***Managing the Database***

**Notes**

## Managing Installations

### Renaming an Installation

You may want to rename an installation, particularly if DU generated an installation name from a file header.

- 1** Select the database containing the installation to be renamed. If the database you want to work with is not the current database, use the **Database Selector** command to select the database.
- 2** At the Main menu, type **M** (Maintain Data). This activates the Installation window.
- 3** Select the installation that you want to rename: Type **N** (Next) until the installation is displayed. If there are many installations, you may prefer to type **L** for **List**, move the highlight bar to the installation you want, and press Enter.
- 4** With the installation displayed, type **R** (Rename Site).
- 5** DU activates the “Site” field. Enter a new name, then press Enter.
- 6** DU activates the “Installation #” field. Enter a new number, then press Enter.
- 7** At the bottom of the screen, DU asks if you want to save the changes. Type **Y**.

Modifying an Installation Record    To modify fields other than “site” and “installation,” use the “Modify” command.

- 1** Select the database containing the installation to be modified. If the database you want to work with is not the current database, use the **Database Selector** command.
- 2** At the Main menu, type **M** (Maintain Data). This activates the Installation window.
- 3** Select the installation that you want to modify: Type **N** (Next) until the installation is displayed. If there are many installations, you may prefer to type **L** for **List**, move the highlight bar to the installation you want, and press Enter.
- 4** With the installation displayed, type **M** (Modify). DU activates the “Desc” field. To move to a different field press Tab.
- 5** To accept your changes, press PgDn. At the bottom of the screen, DU asks if you want to save the record. Type **Y**.

## Managing Data Sets

Renumbering a Data Set      You may want to renumber data sets, particularly after importing data. DU lets you renumber data sets one by one.

- 1** Select the appropriate project database. Use the **Database Selector** command, if necessary.
- 2** At the Main menu, type **M** (Maintain Data). This activates the Installation window.
- 3** Select the installation: Type **N** (Next) until the installation is displayed. If there are many installations, you may prefer to type **L** for **List**, move the highlight bar to the installation you want, and press Enter.
- 4** With the installation displayed, type **O** (Open Next). DU activates the Data Set window.  
Select the data set to renumber: Type **N** (Next) until it is displayed.
- 5** Type **R** (Renumber Set). DU activates the “Data Set #” field.
- 6** Enter a new (unique) data set number and press Enter.
- 7** DU asks if you want to save the data set. Type **Y**. DU then stores the renumbered set.

Moving a Data Set    If a data set is stored under the wrong installation, you can move it to the appropriate installation with the “Transfer Set” command.

- 1** Select the appropriate project database. Use the **Database Selector** command, if necessary.
- 2** At the Main Menu, type **M** (Maintain Data). This activates the Installation window.
- 3** Select the installation: Type **N** (Next) until the installation is displayed. If there are many installations, you may prefer to type **L** for **List**, move the highlight bar to the installation you want, and press Enter.
- 4** With the installation displayed, type **O** (Open Next). DU activates the Data Set window.  
Select the data set you want to transfer: Type **N** (Next) until it is displayed.
- 5** Type **T** (Transfer Set). DU lists the installations in the project database. Move the highlight bar to the target installation and press Enter.  
If the target installation already contains a data set with the same number, DU prompts you to select a different installation. If you want to transfer the data set anyway, you can assign it a different number with the “Renumber Set” command.

**Using the Editor** This simple editor allows you to edit ASCII files. The file editor is also useful for creating DOS batch files.

- 1** From the Main menu, type **A** for **ASCII File Editor**.
- 2** DU prompts for the file to be edited. If you know the file name, enter it now.  
To see a list of files, press Enter. To select a file, use the arrow keys, then pres Enter.
- 3** DU displays editor defaults and a list of editing commands.  
Pres Enter to accept tab spacing. Press Enter again to permit updating. If you type **N**, you can view the file, but you cannot save changes to it.
- 4** DU displays the file for editing.
- 5** After editing, press Ctrl **W** to save the file (hold down the Ctrl key and type **W**). DU saves the file (quickly) and prompts for the next file to load. If there are no other files to edit, press Esc to exit the editor.

**Note** To abandon your edits, press Esc instead of Ctrl **W**.

**Notes**

***Examining Data***

**Notes**

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## Examining Data

### Selecting a Data Set for the Report

- 1** Run DigiPro Utilities. If the database you want to work with is not the current database, use the **Database Selector** command to select the database.
- 2** From the Main menu, type **M** for **Maintain Data**. Type **N** for “Next” to select the installation record you want. Then press Enter. To see a list of all sites and installations, press **L** for “List,” then use the up and down keys to select the installation.
- 3** Press **O** for “Open Next.” DU opens the Data Set window and automatically selects data set #1. To select a different data set, use the “Next” command. To see a list of all data sets for this installation, press **L** for “List,” then move the highlight bar to the data set you want and press Enter.
- 4** Go to instructions for displacement or deviation reports.

### Report of Cumulative Displacement

- 1** Select the current data set.
- 2** Type **C** for “Compare Data.”
- 3** DU asks if you want to compare the data with an initial data set. Press **Y**.
- 4** DU asks if you want to sum from the bottom. Press **Y** if the bottom of the installation is fixed and can be used as reference. Type **N** to use the top of the casing as reference.
- 5** DU asks for the initial data set number. Press Enter to accept data set #1 or enter a different data set number and press Enter.
- 6** DU asks for a conversion factor and the units. The default units (1000 for metric and 12 for English) produce displacements in millimeters or inches.
- 7** DU asks if you want to display incremental deviations (rather than changes in reading units). Type **Y** or **N**.

- 8** DU asks if you want to include checksum statistics. Type **Y** to include statistics or **N** to exclude statistics.
- 9** DU prompts for the destination of the report. You can “print” the report to the screen, to a printer, or to a file. Press **P**, **S**, or **F**. These are explained later in the chapter.

## Report of Cumulative Deviation

- 1** Select the current data set.
- 2** Type **C** for “Compare Data.”  
DU asks if you want to compare the data with a previous data set. Type **N**.
- 3** DU asks if you want to sum from the bottom. Press **Y** if the bottom of the installation is fixed and can be used as reference. Type **N** to use the top of the casing as reference.
- 4** DU asks for the initial data set number. Press Enter to accept data set #1 or enter another data set number and press Enter.
- 5** DU asks for a conversion factor and the units. A value of 1 will produce deviation in meters or feet.
- 6** DU asks if you want to display incremental deviations (rather than differences in reading units). Type **Y** or **N**.
- 7** DU asks if you want to include checksum statistics. Type **Y** to include statistics or **N** to exclude statistics.
- 8** DU prompts for the destination of the report. You can “print” the report to the screen, to a printer, or to a file. Press **P**, **S**, or **F**.

## Viewing Data on Screen

- 1** Run a report of displacement or deviation as explained on preceding pages.
- 2** When DU prompts for the destination of the report (Printer, Screen, or File), press **S** for screen. DU immediately displays tabular data. You can scroll through data with the up and down keys.
- 3** Press End to view B-axis data. Once you press the End key, you cannot return to A-axis data.
- 4** Press Esc when done.

## Printing Data on a Printer

- 1** Run a report of displacement or deviation as explained on preceding pages.
- 2** When DU prompts for the destination of the report (Printer, Screen, or File), press **P** for printer.
- 3** DU asks if you want to print A-axis data. Type **Y** to print or **N** to suppress.
- 4** DU asks if you want to print B-axis data. Type **Y** to print or **N** to suppress.
- 5** DU asks if your printer supports the IBM character set. If your printer supports the IBM character set, type **Y**. Otherwise, type **N**.

The IBM character set includes characters for drawing lines and boxes. If you tell DU that your printer does not support the IBM character set, DU will use dashes and asterisks that are supported by all printers.

- Examples of printed reports are presented at the end of this chapter.

## Printing Data to a File

- 1** Run a report of displacement or deviation as explained on preceding pages.
- 2** When DU prompts for the destination of the report (Printer, Screen, or File), press **F** for File.
- 3** DU prompts for a filename. Enter a file name and press Enter.
- 4** DU asks if you want to print A-axis data. Type Y to print or N to suppress.
- 5** DU asks if you want to print B-axis data. Type Y to print or N to suppress.
- 6** DU asks if your printer supports the IBM character set. If your printer supports the IBM character set, type **Y**. Otherwise, type **N**.

The IBM character set includes characters for drawing lines and boxes. If you tell DU that your printer does not support the IBM character set, DU will use dashes and asterisks that are supported by all printers.

## Incremental Deviations vs. Differences

When you generate a report, DU asks whether to display “Incremental Deviations and Displacements” or “Differences and Changes.” These terms are explained below:

### Incremental Deviations & Displacements

When you select “incremental deviations,” DU displays 0- and 180-readings, and then converts the “average” of these readings to lateral deviation. Lateral deviation at one depth is called “incremental deviation.” In the report, the column heading for incremental deviation is “INCR DEV.”

Displacement is the change in deviation between the current data set and the initial data set (current - initial). Displacement at one depth is called “incremental displacement.” In the report, the column heading for incremental displacement is “INCR DISP.”

Incremental displacements are accumulated from the bottom (or top) to provide a value for cumulative displacement at each depth. In the report, the column heading is “CUM DISP.”

### Example

Look at the 58 foot depth in the sample report. The incremental deviation for the initial (“previous”) set is -0.0504. How did DU arrive at this value?

Find the “average” of 0- and 180-readings:

$$\begin{aligned} \text{Averaged Reading} &= \frac{\text{Reading}_0 - \text{Reading}_{180}}{2} \\ &= \frac{-39 - 45}{2} \\ &= -42 \end{aligned}$$

Convert averaged reading to lateral deviation. This is an English system, so the instrument constant is 20,000. For a result in inches, we multiply by 24.

$$\begin{aligned} \text{Lateral Deviation} &= L \times \frac{\text{Reading Unit}}{20,000} \\ &= 24 \text{ inch} \times \frac{-42}{20,000} \\ &= -0.0504 \text{ inch} \end{aligned}$$

```

SLOPE INDICATOR DATA REDUCTION ----- PAGE 1
Printed by DigiPro on June 7,1993
SITE: DEMO
HOLE NUMBER 45
site description 3.34 test installation
      +- PREVIOUS +-      +- CURRENT +-
DATA SET #          1          5
SENSOR #           26677       26677
DATE              10/05/93 13:44 10/11/93 11:22
READINGS PER DIRECTION 30      30
SENSORS:          26677       26677
=====
      +- PREVIOUS DATA --+      +- CURRENT DATA --+      INCR DISP      CUM.DISP.
DEPTH  A0  A180  INCR.DEV      A0  A180  INCR.DEV      IN.          IN.
2.000  -218  223  -0.2646      -227  206  -0.2598      0.0048      0.2268
4.000  -339  343  -0.4092      -347  329  -0.4056      0.0036      0.2220
6.000  -279  286  -0.3390      -289  271  -0.3360      0.0030      0.2184
8.000  -290  295  -0.3510      -299  283  -0.3492      0.0018      0.2154
10.000 -253  259  -0.3072      -264  246  -0.3060      0.0012      0.2136
12.000 -207  212  -0.2514      -216  195  -0.2466      0.0048      0.2124
14.000 -135  140  -0.1650      -139  125  -0.1584      0.0066      0.2076
16.000  70   -66  0.0816          59  -81  0.0840      0.0024      0.2010
18.000  267 -262  0.3174          269 -279  0.3288      0.0114      0.1986
20.000  84  -79  0.0978          90 -106  0.1176      0.0198      0.1872
22.000 -31  39  -0.0420         -34  24  -0.0348      0.0072      0.1674
24.000  26  -14  0.0240          25  -37  0.0372      0.0132      0.1602
26.000  82  -73  0.0930          76  -90  0.0996      0.0066      0.1470
28.000  87  -84  0.1026          87 -106  0.1158      0.0132      0.1404
30.000  142 -133  0.1650          137 -153  0.1740      0.0090      0.1272
32.000  235 -226  0.2766          230 -243  0.2838      0.0072      0.1182
34.000  217 -210  0.2562          214 -233  0.2682      0.0120      0.1110
36.000  74  -65  0.0834          73  -86  0.0954      0.0120      0.0990
38.000  117 -103  0.1320          99 -111  0.1260     -0.0060      0.0870
40.000  297 -291  0.3528          286 -303  0.3534      0.0006      0.0930
42.000  324 -319  0.3858          323 -339  0.3972      0.0114      0.0924
44.000  174 -169  0.2058          178 -189  0.2202      0.0144      0.0810
46.000 -10  13  -0.0138           -8  -8  0.0000      0.0138      0.0666
48.000  -6  14  -0.0120          -15  -1  -0.0084      0.0036      0.0528
50.000  34  -26  0.0360           30 -42  0.0432      0.0072      0.0492
52.000 -69  78  -0.0882          -76  62  -0.0828      0.0054      0.0420
54.000 -54  53  -0.0642          -52  33  -0.0510      0.0132      0.0366
56.000 -67  75  -0.0852          -72  58  -0.0780      0.0072      0.0234
58.000 -39  45  -0.0504          -32  27  -0.0354      0.0150      0.0162
60.000  29  -19  0.0288           30 -20  0.0300      0.0012      0.0012
=====
END OF RECORDS

```

*Deviations and Displacements*

Example continued    The incremental displacement at 58 feet is 0.0150 inches. How did DU arrive at this value?

$$\text{Incremental Displacement} = \text{Deviation}_{\text{current}} - \text{Deviation}_{\text{initial}}$$

$$= -0.0354 \text{ inch} - (-0.0504 \text{ inch})$$

$$= 0.015 \text{ inch}$$

Cumulative displacement at 58 feet is 0.0162 inch. How did DU arrive at this value?

$$\text{Cumulative Displacement at Depth } n = D_1 + D_2 + \dots + D_n$$

$$= 0.0012 + 0.0150 \text{ inch}$$

$$= 0.0162 \text{ inch}$$

**Differences and Changes** When you select “Differences and Changes,” DU displays 0- and 180-readings, and then calculates a “difference” value. This way of presenting data originated in pre-computer days: Most of the steps in data reduction are carried out in “reading units” which typically involve fewer digits. It is provided as an option for those who are used to looking at “differences and changes.”

The difference value is the algebraic difference of the 0- and 180-reading. In the report, the column heading for difference values is “DIFF.”

The column heading “CHANGE” lists the change between the current difference value and the initial difference value at each depth (current - initial). This is similar to incremental displacement, but is in reading units rather than units of length.

Values under the column heading “CUM DISP” are cumulative displacements.

**Example** Look at the 58 foot depth in the sample report. The difference value for the “previous” set is listed as -84. How did DU arrive at this value?

$$\begin{aligned} \text{Difference Value} &= \text{Reading}_0 - \text{Reading}_{180} \\ &= -39 - 45 \\ &= -84 \text{ reading units} \end{aligned}$$

Change at the 58 foot depth is 25 reading units. How did DU arrive at this value?

$$\begin{aligned} \text{Change} &= \text{Difference}_{\text{current}} - \text{Difference}_{\text{initial}} \\ &= -59 - (-84) \text{ reading units} \\ &= 25 \text{ reading units} \end{aligned}$$

```

SLOPE INDICATOR DATA REDUCTION ----- PAGE 1
Printed by DigiPro on June 7,1993
SITE: DEMO
HOLE NUMBER 45
site description 3.34 test installation
      +- PREVIOUS +-      +- CURRENT +-
DATA SET #          1          5
SENSOR #           26677       26677
DATE              10/05/93 13:44 10/11/93 11:22
READINGS PER DIRECTION 30          30
SENSORS:          26677       26677
=====
      +- PREVIOUS DATA --+      +- CURRENT DATA --+      CHANGE      CUM.DISP.
DEPTH  A0  A180  DIFF      A0  A180  DIFF      IN.
2.000  -218  223  -441      -227  206  -433      8  0.2268
4.000  -339  343  -682      -347  329  -676      6  0.2220
6.000  -279  286  -565      -289  271  -560      5  0.2184
8.000  -290  295  -585      -299  283  -582      3  0.2154
10.000 -253  259  -512      -264  246  -510      2  0.2136
12.000 -207  212  -419      -216  195  -411      8  0.2124
14.000 -135  140  -275      -139  125  -264      11 0.2076
16.000  70  -66  136       59  -81  140      4  0.2010
18.000  267 -262  529      269 -279  548      19 0.1986
20.000  84  -79  163       90 -106  196      33 0.1872
22.000 -31  39  -70       -34  24  -58      12 0.1674
24.000  26  -14  40        25  -37  62      22 0.1602
26.000  82  -73  155       76  -90  166      11 0.1470
28.000  87  -84  171       87 -106  193      22 0.1404
30.000 142 -133  275      137 -153  290      15 0.1272
32.000 235 -226  461      230 -243  473      12 0.1182
34.000 217 -210  427      214 -233  447      20 0.1110
36.000  74  -65  139       73  -86  159      20 0.0990
38.000 117 -103  220       99 -111  210      -10 0.0870
40.000 297 -291  588      286 -303  589      1 0.0930
42.000 324 -319  643      323 -339  662      19 0.0924
44.000 174 -169  343      178 -189  367      24 0.0810
46.000 -10  13  -23       -8  -8  0      23 0.0666
48.000  -6  14  -20      -15  -1  -14      6 0.0528
50.000  34  -26  60       30  -42  72      12 0.0492
52.000 -69  78  -147      -76  62  -138      9 0.0420
54.000 -54  53  -107      -52  33  -85      22 0.0366
56.000 -67  75  -142      -72  58  -130      12 0.0234
58.000 -39  45  -84      -32  27  -59      25 0.0162
60.000  29 -19  48       30  -20  50      2 0.0012
=====
END OF RECORDS

```

*Differences and Changes*

Example continued The cumulative displacement at 58 feet is 0.0162 inches. How did DU arrive at this value? First, find the cumulative change at each depth (in traditional terminology: the “sum of changes”).

$$\text{Cumulative Change}_n = \text{Change}_1 + \text{Change}_2 + \dots + \text{Change}_n$$

$$= 2 + 25$$

$$= 27 \text{ reading units}$$

Since the 0- and 180-readings have not been “averaged,” we must divide by two:

$$= 13.5 \text{ reading units}$$

Finally, we must convert reading units to inches:

$$\text{Displacement in Inches} = L \times \frac{\text{Reading Units}}{20,000}$$

$$= 24 \text{ inch} \times \frac{13.5}{20,000}$$

$$= 0.0162 \text{ inch}$$

**Validating Data** DU lets you validate data in the active database. Validation displays checksums and standard deviations for the selected data set. In general, validation is best done in the field, since you can retake the data if necessary.

**Note** To learn more about checksums, see Chapter 8.

Use the following procedure to validate data.

- 1** Select the database containing the data set you want to validate. If the database you want to work with is not the current database, use the **Database Selector** command to select the database.
- 2** From the Main menu, type **M** for **Maintain Data**. The data display screen appears, with the first installation in the current database highlighted.
- 3** To select a different installation, type **N** for **Next**. If there are many installations, you may prefer to type **L** for **List**, move the highlight bar to the installation you want, and press Enter.
- 4** Type **O** for **Open Next** to open the Data Set window. The Data Set window contains the first data set in the installation.
- 5** Select the **Open Next** command to open the Data window. The Data window displays the first reading from the current data set.
- 6** Select the **Validate Data** command. DU displays the mean and standard deviation for the A and B direction checksums for the entire data set. At the bottom of the screen, DU asks for the number of readings you want included in each group.
- 7** Enter the number of readings you want included in each group and press Enter. DU displays the mean and standard deviation for the checksums for each group. The depths included in each group are also shown. If there are more groups than will fit on the screen, you can press any key to display the additional groups.
- 8** After displaying statistics on all groups, DU prompts you to enter a group number. Enter a group number or press PgDn to exit.

DU will display readings and statistics on each depth in the group. At the bottom of the screen, DU displays statistics for all depths in that group.

After viewing information about the group, press Enter to return to the display of all groups. You can then select another group to examine. Press PgDn to exit the **Validate Data** function.

**Notes**

***Entering Settlement and Spiral  
Data***

**Notes**

## Entering Settlement Data

**Overview** Chapter 8 offers a brief discussion of the effects of settlement and casing spiral on inclinometer data. This chapter deals with the mechanics of entering and applying corrections for settlement and spiral.

DU's "Settlement" command lets you enter settlement data from Magnetic Extensometers or Sondex Systems. Afterwards it corrects depths and readings in a selected data set.

The data that you enter must be the depth-to-magnet or depth-to-ring measurements that are noted on a field data sheet. DU cannot operate on "reduced" settlement data that has been compared with a datum magnet or ring.

Before DU applies settlement corrections, it makes a copy of the original data set and stores it under a negative data set number. For example, if you have selected data set "8" for corrections, DU makes a copy of this data set and preserves it as data set "-8."

If new sections of casing are added to the top of the installation to accommodate settlement, the earliest reading for each new section is automatically used as its initial reading. No manual correction is necessary.

## Entering Settlement and Spiral Data

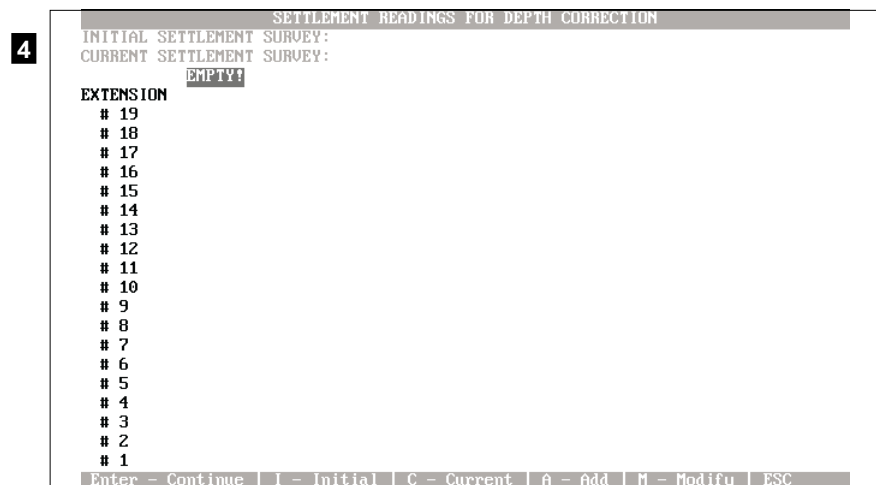
---

Step 1: This task assumes that the project database already contains the  
Select Data Set to Correct data set that you want to correct. You must have two settlement surveys ready to enter: the initial survey and the current survey.

- 1** Start DU. Select the appropriate project database.
- 2** At the Main Menu, type **M** for **Maintain Data** to activate the Installation window.
- 3** Select the installation: Type **N** for **Next** until DU displays the appropriate site and installation. If there are many installations, you may prefer to type **L** for **List**, highlight the installation with the arrow keys, and press Enter.
- 4** Select the current data set: Type **O** for **Open Next** to activate the Data Set window. Then type **N** for **Next** until DU displays the current data set. If there are many data sets, you may prefer to type **L** for **List**. You can also type **J** for **Jump To**, enter the number of the current data set, and press Enter

Step 2:  
Entering Initial Settlement Data

- 1** Now, with the “current” data set selected, type **S** for **Settlement**.
- 2** DU prompts for the initial data set. Enter the number of the initial (inclinometer) data set and press Enter.
- 3** DU displays an entry screen. The first time you see this screen, the word “Empty!” appears. Later, the screen will show columns of settlement data that you have entered.



- 5**
- 6** Type **A** to **Add** settlement data. DU replaces the “Empty” field with today’s date. A column of zeroes also appears. Ignore the “Initial” and “Current” commands at the bottom of the screen. They are not used for data entry.
- 7** Type in the date of *initial* settlement survey (overwrite today’s date) and press Enter. Note that the date must be entered as month, day, and year.
- 8** The cursor moves to the “extension” field. Press Enter to skip this field. It is explained later.
- 9** Now the cursor jumps to #1 at the bottom of the screen. #1 represents the datum magnet or datum ring. Using the initial settlement readings, enter the reading for the datum magnet and press Enter. The value that you enter must be depth-to-magnet or depth-to-ring measurement. Do not enter reduced data.
- 10** The cursor moves to #2. Enter the reading for the second magnet or ring and press Enter.
- 11** Continue entering readings for the other magnets or rings. When you enter the last reading, press PgDn to save your entries.

## Entering Settlement and Spiral Data

Step 3: Entering Current Settlement Data  
There may be more settlement readings in the current set than in the initial set. Also, the depth-to-datum may be greater if sections of casing have been added. DU handles such variations automatically.

- 1 Type **A** to start a new column for the current set of settlement readings. Today's date appears at the top of a column of zeros. Again, ignore the "Initial" and "Current" commands at the bottom of the screen. They are not used for data entry.
- 2 Type in the date of *current* settlement survey (overwrite today's date) and press Enter.
- 3 The cursor moves to the "extension" field. Press Enter.
- 4 Now the cursor jumps to #1 at the bottom of the screen. #1 represents the datum magnet or datum ring. Using the current settlement readings, enter the reading for the datum magnet and press Enter. The value that you enter must be depth-to-magnet or depth-to-ring measurement. Do not enter reduced data.
- 5 The cursor moves to #2. Enter the reading for the second magnet or ring and press Enter.
- 6 Continue entering the other readings. When you enter the last reading, press PgDn to save your entries.

SETTLEMENT READINGS FOR DEPTH CORRECTION		
INITIAL SETTLEMENT SURVEY:		
CURRENT SETTLEMENT SURVEY:		
	04/29/93	07/21/93
EXTENSION	0.00	0.00
# 19		
# 18		
# 17		
# 16		
# 15		
# 14		
# 13		
# 12		
# 11		
# 10		
# 9		
# 8		
# 7	10.00	9.90
# 6	20.00	19.80
# 5	30.00	29.70
# 4	40.00	39.60
# 3	50.00	49.50
# 2	60.00	59.40
# 1	70.00	69.30
Enter - Continue   I - Initial   C - Current   A - Add   M - Modify   ESC		

Step 4: Applying Corrections In this step, you must tell DU which settlement set is the “initial” and which is the “current.” Later, DU will remember this and you will simply tell it which set is current.

- 1** Identify the initial settlement set: Move the highlight bar to the date for the initial settlement set. Then press **I** for **Initial**. DU confirms your selection at the top of the screen.
- 2** Identify the current settlement set: Move the highlight bar to the date for the current set. Then press **C** for **Current**. DU confirms your selection at the top of the screen.
- 3** Now press Enter to apply settlement corrections to the current inclinometer data set. DU displays a “Working” message while it interpolates depths and data.
- 4** When the corrections are complete, check the “Operator” field in the data set window. It should say “COR-SETTLE” to mark the set as having been corrected for settlement. If you press **L** for **List**, you will see that the original data has been stored under a “negated” number.

*Corrected data set has new depths and interpolated data*

Installation	Data Set					Commands
Site SR18	Site: SR18	Installation: TM2	Rd Set: 7		return	
Installation # TM2	Depth	A0	A180	B0	B180	ing
Desc Slide at Tiger	1.980	-504	503	190	-233	us
Date of Entry 03/08/	3.960	-293	301	-57	25	o
Usual Sensor No 1	5.940	324	-317	-216	182	—
Shallowest Depth	7.920	415	-411	-141	90	te Data
Deepest Depth 70.0	9.900	341	-338	-212	155	—
Reading Interval 2.	11.880	283	-276	-267	210	—
A0 Direction	13.860	211	-210	-306	261	—
Orientation 0.000	15.840	161	-155	-372	320	—
Offset/Stickup 0.0	17.820	102	-100	-442	387	—
	19.800	29	-26	-414	362	—
	21.780	94	-92	-485	431	—
	23.760	173	-166	-414	370	—
	25.740	245	-240	-423	367	—
	27.720	190	-185	-404	347	—
	29.700	110	-107	-421	387	—
Depth 1.980						—

*Uncorrected data set has original depths*

Installation	Data Set					Commands
Site SR18	Site: SR18	Installation: TM2	Rd Set: -7		return	
Installation # TM2	Depth	A0	A180	B0	B180	ing
Desc Slide at Tiger	2.000	-504	503	190	-233	us
Date of Entry 03/08/	4.000	-289	297	-63	31	o
Usual Sensor No 1	6.000	343	-337	-221	187	—
Shallowest Depth	8.000	418	-415	-138	86	te Data
Deepest Depth 70.0	10.000	338	-334	-216	159	—
Reading Interval 2.	12.000	280	-273	-271	214	—
A0 Direction	14.000	206	-206	-309	265	—
Orientation 0.000	16.000	158	-151	-378	325	—
Offset/Stickup 0.0	18.000	97	-95	-449	394	—
	20.000	22	-19	-411	359	—
	22.000	103	-102	-495	441	—
	24.000	183	-175	-403	361	—
	26.000	255	-250	-427	369	—
	28.000	180	-175	-401	344	—
	30.000	98	-96	-425	395	—
Depth 2.000						—

**Using the Extension Field** Sometimes a short extension is added to the top of the casing to compensate for settlement. The idea is to maintain a constant distance between the top of the casing and the bottom reading-depth / datum. As settlement occurs, the extension is lengthened. You can enter the length of the extension in the extension field.

Note that DU and DigiPro can process data accurately without this value. If you do not use the extension field, make sure that its value is zero.

**Deleting a Mistake** If you correct a data set with the wrong settlement data, you must delete the “corrected” set and replace it with the original, uncorrected set. You can then apply corrections again with the appropriate settlement data.

- 1** Choose the data set to be deleted, then type **D** for **delete**.
- 2** DU prompts: **Delete Complete Data Set (Y/N)**. Type **Y** and press Enter to delete the data set. (To cancel, press PgDn.)
- 3** Now find the data set with the original data, the “negative” counterpart of the corrected set. For example, if you deleted data set “7,” select data set “-7.”
- 4** Press **R** for **Renumber Set**. The cursor moves to the **Data Set #** field. Remove the minus sign. For example, change “-7” to data set “7.” Then press Enter.
- 5** At the bottom of the screen, DU prompts **Save (Y/N)?** Type **Y**. Now the original data is restored under the original data set number.
- 6** You can apply settlement corrections again. If the mistake was in the settlement data that you entered, view the data on the settlement-readings screen. Correct the mistake using the “modify” command.

## Processing a Spiral Data Set

**Introduction** A single spiral set is used to correct all the data sets that belong to the installation. When DigiPro creates a graph, it applies spiral corrections automatically if a spiral set has been selected.

Spiral data must be processed before it can be applied. This one-time processing is necessary because readings from the spiral sensor are taken at different intervals than those of the the inclinometer probe.

DU's "Xpand Spiral" command is used to process the spiral set.

- Preparations**
- 1** Obtain a spiral data set using a spiral sensor. Since casing spiral is not expected to change over time, a single spiral set is used to correct all the data sets that belong to an installation.
  - 2** The spiral sensor is calibrated at the time of the survey and an "Offset" is recorded. You must have that offset value to process the spiral set.
  - 3** The spiral set must be stored in the appropriate project database. If you recorded the spiral survey with the Digitilt DataMate or Digitilt PC, the spiral set is transferred to the PC along with other data sets. If you recorded the spiral set with a Digitilt RPP, you must import the spiral set as you import other RPP data sets. If you recorded the spiral survey on paper, you must enter it manually using the DigiPro Utilities program. See Chapter 2 for instructions on manual entry of data.

- Expanding the Spiral Set
- 1** Start DU. Select the appropriate project database.
  - 2** At the Main Menu, type **M** for **Maintain Data** to activate the Installation window.
  - 3** Select the installation: Type **N** for **Next** until DU displays the appropriate site and installation. If there are many installations, you may prefer to press **L** for **List**, highlight the installation with the arrow keys, and press Enter.
  - 4** Select the spiral set: Type **O** for **Open Next** to activate the Data Set window. Then type **N** for **Next** until DU displays the number of the spiral set. The **Spiral Set?** field should have a value of **Y**.  
If there are many data sets, you may prefer to type **L** for **List**, or **J** for **Jump To**, enter the number of the spiral set, and press Enter.
  - 5** Type **X** for **Xpand Spiral**. This command is displayed at the bottom of the command window.  
If the command does not appear, check that the **Spiral Set?** field for this data set is set to **Y**. If it is not, and you are sure that you have selected the spiral set, type **M** for **Modify**, change the value to **Y**, press PgDn and answer yes to the “Save” prompt.
  - 6** DU prompts for a zero-offset. Enter the offset for this spiral set and press Enter. If a value is already entered (stored in the **Offset A** field), simply press Enter.
  - 7** DU prompts for the data that you want to use. For each axis, enter **Y** or **N**. DU averages the axes that are marked **Y**.
  - 8** DU asks if the sensor is an English sensor. Enter **Y**, or **N** if you are using a metric sensor. DU then expands the spiral set.