TDS Survey Pro CE Version 2.1.8
Setup RTK Base on known NAD83/WGS84 Point: Mapping Plane – Geoid99 Modeling.

Pre-load known NAD83 State Plane Coordinates and appropriate NGS Geoid 99/96 data files into the Ranger using TDS Survey Link or, Microsoft Active Sync V3.1 © software.

Reset Base GPS Receiver: press ⇑ Arrow to "SETTINGS" | press ⇓ arrow for 3 Seconds | RESET Tap ⇓ arrow | Reset Receiver ? | press ⇑ & ⇓ arrow together – receiver displays "Done".

Connect TDS Ranger to Base RTK Receiver – Serial Port A.
Double-Tap on **Survey Pro** icon…

What do you want to Do ?

Open an Existing Job… <tap>, or

[1] Job [C] Open <tap>

Open
Type: Select Job Files (*.job) or, Coordinate Files (*.cr5)
Reston2RTK.cr5 or,
⊗Reston2RTK.job <tap>

[1] Job [A] Settings <tap>

Settings
Receiver Tab:

Brand: **[Ashtech]**
Model: **[Z-Surveyor/Z-Xtreme]**
GPS Mode: **[RTK]**
[Receiver settings…] <tap>

GPS Receiver Settings
Receiver Tab

Brand: **Ashtech**
Model: **Z-Surveyor/Z-Xtreme**

Format for RTK **[DBEN]**
Communications:

Serial Port	(Data Collector):	COM1
Serial Port	(GPS Receiver):	A
Baud Rate	9600	
Parity	None	**[Change…]** <tap>

GPS Receiver Settings
Base Radio Tab

Radio Modem: [Pac Crest]
Serial Port

Baud Rate 9600
Parity None **[Configure Serial]**
Serial B (External Pacific Crest PDL Base Radio – Uses Port B).

Radio Settings

Channel: 0
Sensitivity Low **[Configure Modem]**
[OK] <tap>

Settings
Projection Tab

Projection Types:

Horizontal: **Mapping Plane**

Vertical: **Geoid Model**

Path to Data Files:
\Disk\TDS Geodata **[Browse]**

If the RTK Base Station HAS a known Orthometric elevation – Select ***Geoid Model.***
If the RTK Base DOES NOT have a known Orthometric elevation – Select ***Localization, or Ellipsoidial Height.***

Settings
Post Process

If you desire to collect data for Post Processing during the RTK Survey, i.e. ***"Concurrent RTK"***, Enter an appropriate "Recording Interval". The default Recording Interval: None.

Recording Interval: 10 sec — Browse the list & select the appropriate Recording Interval; ensure the Base & Rovers sample data at the same rate.

Settings
Post Process – Continued

Recording Interval: 10 secs

Survey Pro Threshold Management:

[ ] Use Threshold Manager

Satellite Threshold: [5]

HDOP Threshold: [12]

Memory Threshold: [0] KB

Settings
Units Tab

Units for Distance: **Meters**
Units for Angles: **Degrees**
Display Directions as: **Azimuth**
Azimuth Type: **North Azimuth**
[OK] <tap>

Select appropriate "Units for Distance" to match stored coordinates in .cr5, or .job file.

Settings
Files Tab

Control File:
[ ]

[Browse]

Description File:
[Codes.txt]
[Browse]

If you have a pre-defined Data Collection Code list, or Data Dictionary, copy this file into the Ranger's \Disk\TDS Jobs directory. This file can then be associated to any project. During data collection, a pop-up menu with these description files will be made available to the user to choose from.

[2] Survey [F] Projection <Tap>

Projection
Horizontal Tab

Mapping Plane: Unsolved

[Mapping Plane Setup…] <Tap>

Mapping Plane Setup

Region: **U.S.A. (NGS)**
Coordinate System: **State Plane 1983**
Horizontal datum: **NAD 1983**
Zone: **Virginia North**

[Finish] <tap>

Projection
Vertical Tab

Geoid Modeling: **Geoid Model selected**

Model: **NGS Geoid 99/96**

Base Station needs to be set for geoid model use.
Elevations will be calculated relative to the base station.

[Geoid Model Setup…] <tap>

Geoid Model Setup
Geoid Model: **[NGS Geoid 99/96]**

[Accept] <tap>

Projection - **[Close]** <tap>

To take advantage of Survey Pro's Geoid Modeling capability, you need to copy the appropriate NGS Geoid99/96 data file into the Ranger before adjourning outside for RTK surveying. TDS Survey Link can be used to create a NGS Geoid99 Sub-grid file.

*OFFICE PC w/**TDS Survey Link | Geodetic | Create Sub-grid file…***

[2] Survey [B] Base Setup <Tap>

Current GPS Base Station

[Setup…] <Tap>

+ Base Point: [ ] ∇ <Tap> on down arrow, select from the following:

"Choose from List…" or **"Choose from map…".**

In this example, select: **"Choose from list…"**

Select Point

Browse the Point List, select the appropriate point for the RTK Base station – **"105", "MAX1",** then <Tap> on **OK.**

Last Antenna for this receiver:
Antenna: Geodetic IV –GP: (P/N 701975-01)
Measured To: Bottom of Mount

Measured: 2.000 [Setup HR] <tap>

Base Receiver Antenna

Antenna Type: [Geodetic IV –GP: (P/N 701975-01] ***(Browse list available)***

Measure To: [Bottom of Mount] ***(Other Choice = Slant Measure Mark)***

Measured: [2.000]

Offset: [0.059]

Set < tap >

Enter the HI of the RTK Base stations GPS Antenna & select the appropriate Ashtech GPS Antenna by it's description / Ashtech Part Number. (-GP = no Ground Plane Used; +GP = Ground Plane used.)

<Tap> "**Next"**

Base Setup

Base Point: **105**

Latitude: **38° 56' 59.85970" N**
Longitude: **77° 21' 43.12276" W**
Ellipsoid: **123.112 m**

<Tap> "**SET"**

Tech Tip:

*If you selected the proper **"Units for Distance"** in the Settings/Unit Tab and the proper coordinate system in the "**Mapping Plane Setup",** the RTK Base point position will be displayed in WGS84 Latitude, Longitude & Ellipsoid height.*

*If you have a print out of the Project's Northing & Easting coordinates and Latitude & Longitude's – visually inspect the Base's position displayed in Latitude, Longitude and height. The Lat/Long should exactly match,**This your "In the Field" double check everything is set up correctly.***

Ensure the Pacific Crest PDL Base Radio is turned on, the "TX" light should be blinking every other second, indicating the radio is broadcasting data.

Disconnect the TDS Ranger from the Base RTK receiver and connect it to the RTK Rover receiver.

[2] Survey [C] Rover Setup <Tap>

Reset Rover GPS Receiver: ⇑ Arrow to "SETTINGS" | ⇓ arrow for 3 Seconds | RESET Tap ⇓ arrow | Reset Receiver ? | ↵ <enter> "Done".

Rover Setup

<Tap> Settings…

Brand: **Ashtech**
Model: **Z-Surveyor/Z-Xtreme**
GPS Mode: **RTK**

<Tap> **Receiver settings…**

GPS Receiver Settings

Brand: **Ashtech**
Model: **Z-Surveyor / Z-Xtreme**

Format for RTK: [DBEN]

Communications:

Serial Port (Data Collector):		COM1
Serial Port (GPS Receiver):		A
Baud Rate	9600	
Parity	None	**[Change…]** <tap>

GPS Receiver Settings
Rover Radio Tab…

Ensure RTK Rover Radio settings are properly set:

Radio Modem: [Pac Crest]
Serial Port

Baud Rate	9600	
Parity	None	**[Configure Serial]**
Serial	D	(internal Pacific Crest PDL-RXO Base Radio – Use Port D).

Serial Port
Baud rate: **9600**
Parity: **None** [Configure Serial]
Serial: **D**

Radio Settings
Channel: **0**
Sensitivity **High** [Configure Modem]

<Tap> **OK**
<Tap> **OK**

Notes: If the Z-Surveyor/Z-Xtreme is configured with an Internal radio, select **Serial Port D** in the **Rover Radio** tab. If the RTK Rover uses an external radio, select Serial Port B.

Ensure the proper Rover Radio Channel is being used, it must match the Radio channel selected on the Base radio.

Rover Status: **Rover is not Set**

Base Point is located at **105**
Lat: **38° 56′ 59.85970″ N** Height: **123.112 m**
Long: **77° 21′ 43.12276″ W**

Last Antenna for this receiver:
Antenna: Geodetic IV –GP: (P/N 701975-01)
Measured To: Bottom of Mount

Measured: 2.000 [Setup HR] <tap>

Rover Receiver Antenna

Antenna Type: [Geodetic IV –GP: (P/N 701975-01] ***(Browse list available)***

Measure To: [Bottom of Mount] ***(Other Choice = Slant Measure Mark)***

Measured: [2.000]

Offset: [0.059]

Set < tap >

Enter the HI of the RTK Base stations GPS Antenna & select the appropriate Ashtech GPS Antenna by it's description / Ashtech Part Number. (-GP = no Ground Plane Used; +GP = Ground Plane used.)

<Tap> **Set Rover…**

The RTK Rover should now be computing a Fixed Ambiguity position if the following conditions are met: ***5-6-7 Rule = (Pdop<5 - 6+ SV's - <7Km Distance).***

The RTK Rover is tracking at least five satellites and receiving RTK corrections from the Base RTK system. To confirm, observe the current status on the front panel of the Z-Surveyor/ Z-Xtreme.

Observe the "Receive Radio" status LED – Green LED should be blinking every other second. Observe the SV's tracked status LED – it should blink red, then green for every SV tracked. (8 Green LEDS = 8 SV's tracked).

[2] Survey [A] GPS Status <Tap>…

GPS Status
Receiver Tab

Receiver	Satellites:
Mode: **Rover**	Used: **8**
	Locked: **7**
Memory: **7497 Kb**	
Battery: **98 %**	[Reset Ambiguities]

Position Quality:

Solution:	**Fixed**	
H. Precision:	**0.012 m**	HDOP: **1.20**
V. Precision	**0.014 m**	VDOP: **1.35**
		PDOP: **001**

[2] Survey [A] GPS Status <Tap>…

GPS Status
Data Link Tab

Receiver Mode: **Rover**

Radio Reception:

Signal Latency:	**0.038**
Reception:	**100 %**

Position Quality:

Solution:	**Fixed**	
H. Precision:	**0.012 m**	HDOP: **1.20**
V. Precision	**0.014 m**	VDOP: **1.35**
		PDOP: **001**

[2] Survey [A] GPS Status <Tap>…

GPS Status
Sky View… Observe current SV Sky View…

GPS Status
Sat Info… Observe current SNR Plot / Observe SV List…

GPS Status
Position… Observe current Northing, Easting & elevation…

<Tap> **Close**

Your now ready to perform Data Collection and/or Stakeout….

[2] Survey [E] Data Collection

-or-

[3] Stakeout [A] Stake Points

For additional information, please consult the TDS Survey CE Manuals.

Prepared by Bob LeMoine – Thales Navigation, Last Updated 5-14-01