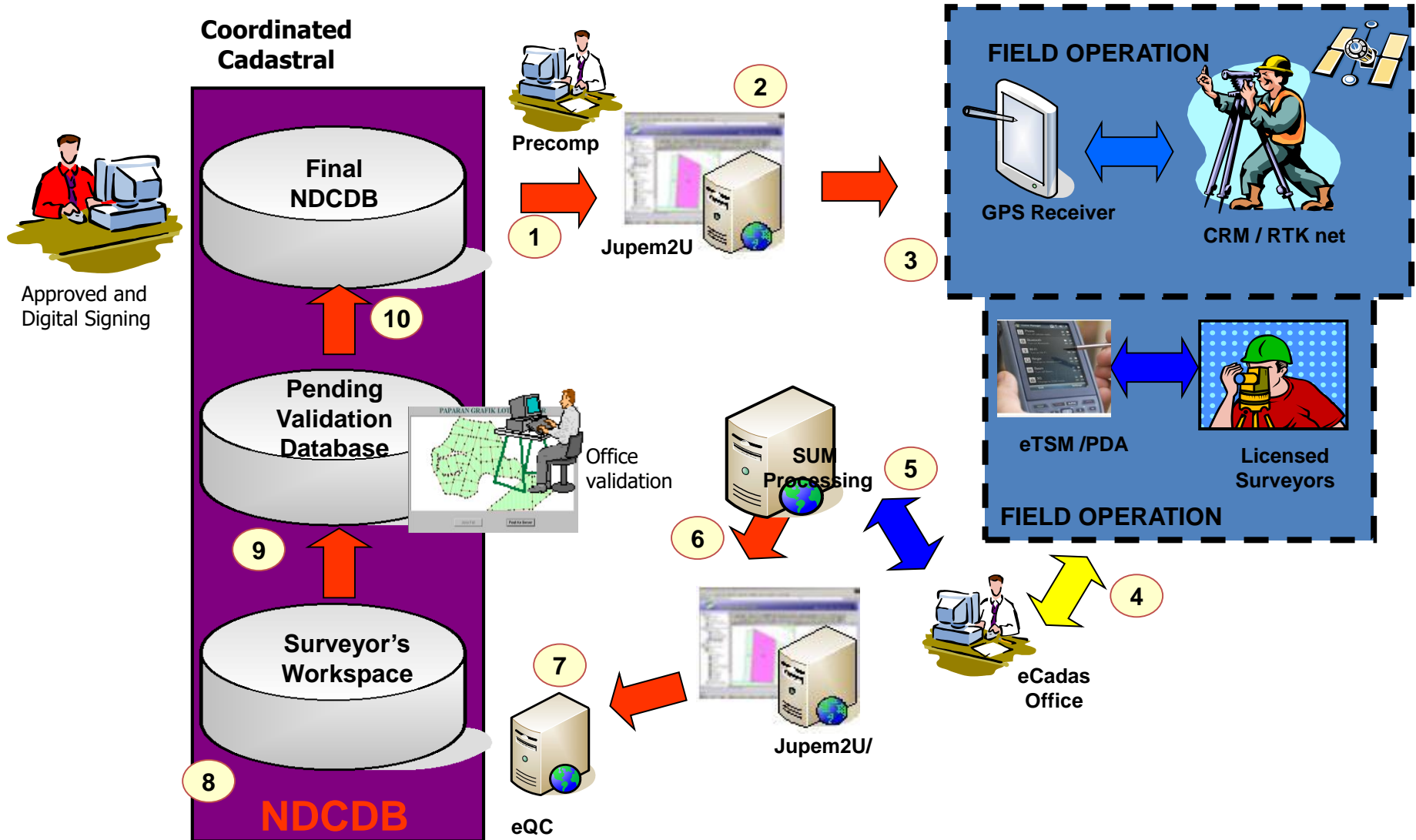# eTSM
Title Survey Module

Landsoft Sdn Bhd

eCadas Workflow
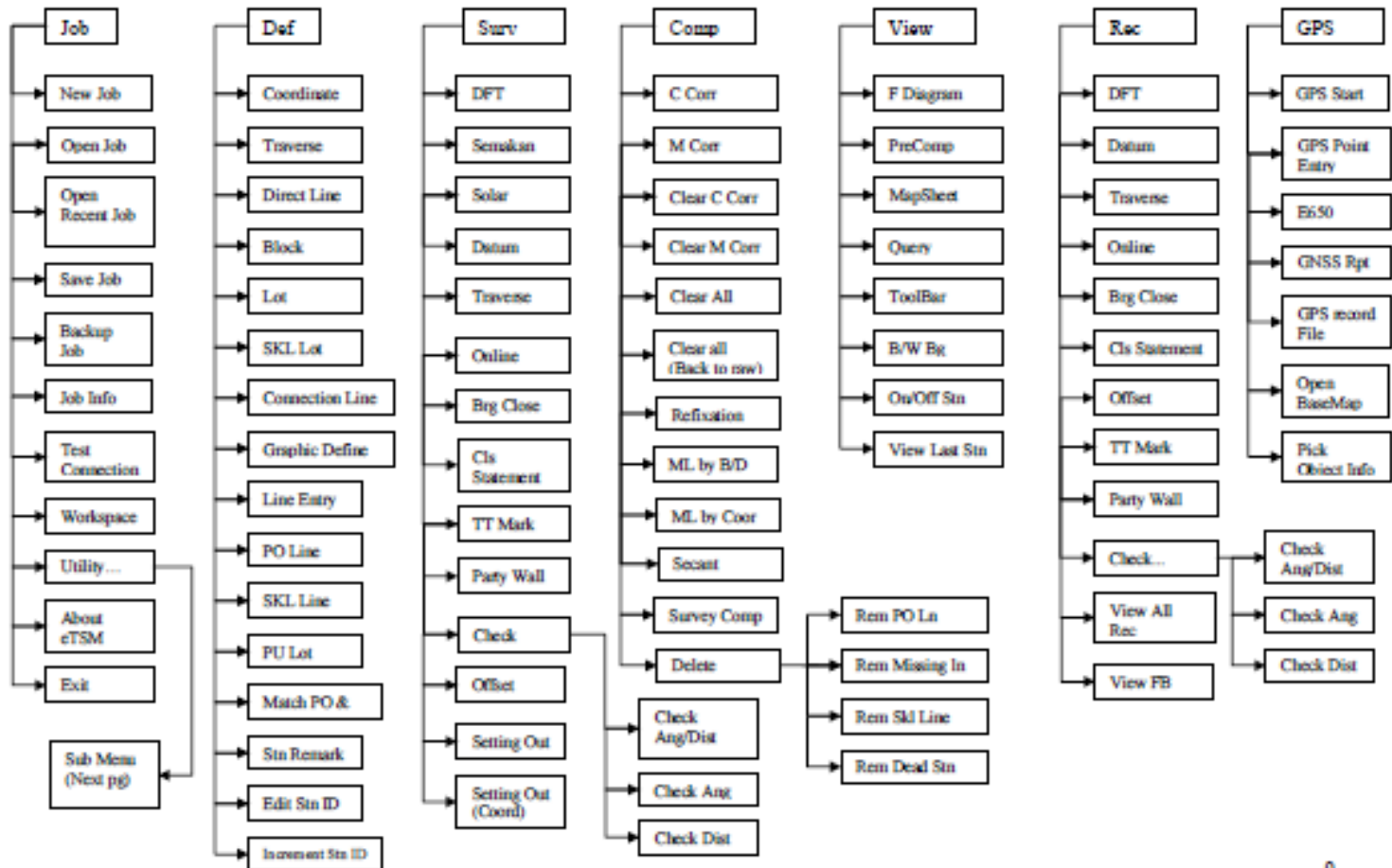
NOMAD DATA CONTROLLER

- Nomad data controller with eTSM (Title survey module) running on the Microsoft Windows Mobile 6 operating systems.

```
                              ┌─────────────┐
                              │  Start Job  │
                              └─────────────┘
                                     │
                                     ▼
                            ┌─────────────────┐
                            │ Job Information │
                            └─────────────────┘
                                     │
                                     ▼
     ┌ ─ ─ ─ ─ ─ ─ ┐        ┌─────────────┐        ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
     │  ┌────────┐ │◄───────│  GPS (CRM)  │◄──────  │  ┌──────────────────┐
        │  RTK   │          └─────────────┘         │  │ Solar Observation│
     │  └────────┘ │              │              │     └──────────────────┘
        ┌────────┐                ▼                 │  ┌──────────────────┐
     │  │ Static │ │        ┌───────────────┐    │     │  Diff. Field Test│
        └────────┘          │ Field Capture │─┐      │  └──────────────────┘
     └ ─ ─ ─ ─ ─ ─ ┘        └───────────────┘ │   │     ┌──────────────────┐
                                  │           │      │  │      Datum       │
                                  │           │   │     └──────────────────┘
                                  ▼           │      │  ┌──────────────────┐
                           ┌──────────────┐   │   │     │     Traverse     │
                           │ Field Sketch │◄──┘      │  └──────────────────┘
                           └──────────────┘      │     ┌──────────────────┐
                                                     │  │      On Line     │
                                                  │     └──────────────────┘
                                                     │  ┌──────────────────┐
                                                  │     │   Bearing Close  │
                                                     │  └──────────────────┘
```

GPS (CRM) options:
- RTK
- Static

Field Capture options:
- Solar Observation
- Diff. Field Test
- Datum
- Traverse
- On Line
- Bearing Close
- Close Statement
- Daily Check
- Check Angle & Dist.
- Offset Details
- Party Wall
- Refixation
- Setting Out

Loop Defination options:
- Fixed Coordinate
- Traverse
- Block / Lot
- Direct Line
- Connection Line

Computation options:
- M & C Correction
- PO & New Comparison
- Traverse Misclosure
- Block / Lot Misclosure
- Direct / Mean / Connection Line
- Coordinate
- Area Comparison

Output options:
- Solar Report
- EDM Test Report
- Digital Field Book
- PO & New Report
- Baseline Report
- 16 JUPEM ASCII
- CRM Files

Process flow: Start Job → Job Information → GPS (CRM) → Field Capture → Field Sketch → Loop Defination → Computation → Output

Main Menu

Job
- New Job
- Open Job
- Open Recent Job
- Save Job
- Backup Job
- Job Info
- Test Connection
- Workspace
- Utility....
- About eTSM
- Exit
- Sub Menu (Next pg)

Def
- Coordinate
- Traverse
- Direct Line
- Block
- Lot
- SKL Lot
- Connection Line
- Graphic Define
- Line Entry
- PO Line
- SKL Line
- PU Lot
- Match PO &
- Stn Remark
- Edit Stn ID
- Increment Stn ID

Surv
- DFT
- Semakan
- Solar
- Datum
- Traverse
- Online
- Brg Close
- Cls Statement
- TT Mark
- Party Wall
- Check
  - Check Ang/Dist
  - Check Ang
  - Check Dist
- Offset
- Setting Out
- Setting Out (Coord)

Comp
- C Corr
- M Corr
- Clear C Corr
- Clear M Corr
- Clear All
- Clear all (Back to raw)
- Refixation
- ML by B/D
- ML by Coor
- Secant
- Survey Comp
- Delete
  - Rem PO Ln
  - Rem Missing In
  - Rem Skl Line
  - Rem Dead Stn

View
- F Diagram
- PreComp
- MapSheet
- Query
- ToolBar
- B/W Bg
- On/Off Stn
- View Last Stn

Rec
- DFT
- Datum
- Traverse
- Online
- Brg Close
- Cls Statement
- Offset
- TT Mark
- Party Wall
- Check...
  - Check Ang/Dist
  - Check Ang
  - Check Dist
- View All Rec
- View FB

GPS
- GPS Start
- GPS Point Entry
- E650
- GNSS Rpt
- GPS record File
- Open BaseMap
- Pick Object Info

Q

Familiar Data Collection form

- Field book look alike form provide familiar working environment for surveyors.

Solar

Traverse

Data collection functions

Diff Field Test	To perform Differential Field Test before starting job.		
Semakan Harian	To perform everyday Check Bearing and Distance before starting job.		
Solar Obs.	To perform SOLAR OBSERVATION measurement.		
Datum	To perform DATUM line measurement.		
Traverse	To perform normal TRAVERSE line measurement.		
Online	To perform ONLINE measurement.		
Bearing Close	To perform BEARING CLOSE measurement.		
Close Statement	To define CLOSE STATEMENT.		
TT Mark	To perform TT MARK measurement.		
Patty Wall	To perform Patty Wall measurement.		
Check…	Check Angle Dist	To perform CHECK ANGLE & DISTANCE measurement together.	
	Check Angle	To perform CHECK ANGLE measurement.	
	Check Distance	To perform CHECK DISTANCE measurement.	
Offset (Details)	To perform OFFSET measurement to pick up details.		
Compile Line	To key in Compile Line for Partly Survey and compile		
Setting Out	Perform SETTING OUT to track and plant new mark.		
Setting Out (Coord)	Perform SETTING OUT to track and plant new mark with Coordinate method.		

DIFFERENTIAL FIELD TEST
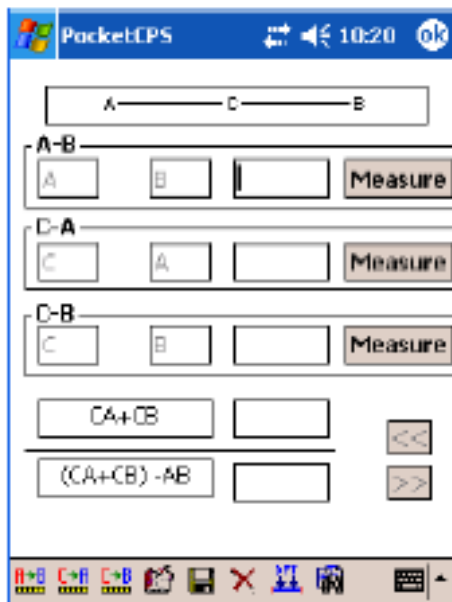
A→B		Measure A-B button. Measures distance from A to B
C→A		Measure C-A button. Measures distance from C to A
C→B		Measure C-B button. Measures distance from C to B
		Reduce button. Reduces the measurement to produce mean, reduction and final value.
		Save button. Set save index to save measurement to database
✕		Delete button. Deletes the record (applicable during view record mode).
		View Field Book button. View the record in field book.
Measure		Measure button. Meausure.

SEMAKAN HARIAN

|	
dist	Measure button. Measures Face Left the first time and Face Right for the second time
	Reduce button. Reduces the measurement to produce mean, reduction and final value. Comparison between computed and true line distances will be shown.
	Save button. Set save index to save measurement to database.
	View Sketch button. View the sketch of measurement.
	Delete button. Deletes the record (applicable during view record mode).
	View Field Book button. View the record in field book.
Last stn	View Last Station button. To check the used last station.

DATUM
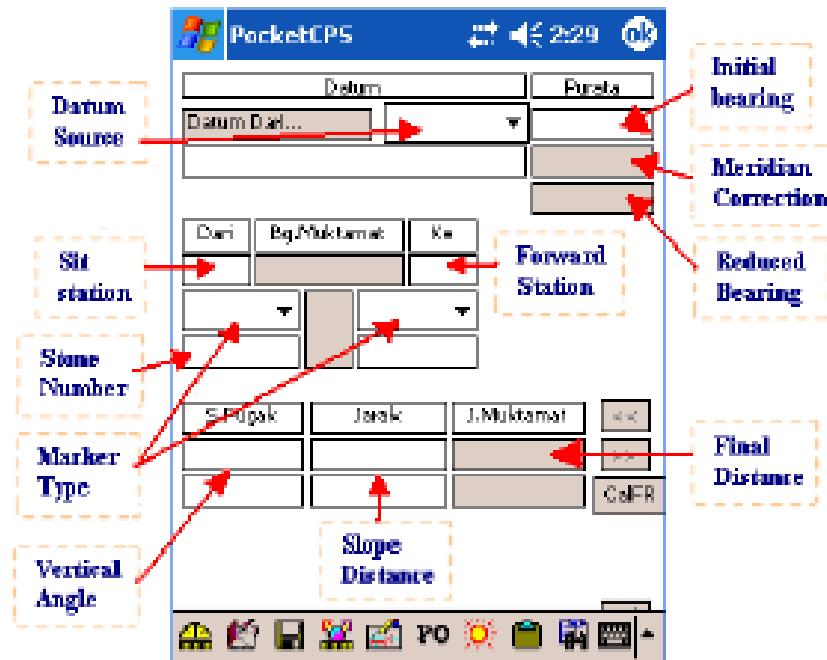
	Measure button. Measures Face Left the first time and Face Right for the second time
	Reduce button. Reduces the measurement to produce mean, reduction and final value.

TRAVERSE

	Measure button. Measures Face Left the first time and Face Right for the second time
	Save button. Set save index to save measurement to database.
	Measure All button. Measures both face left and face right measurements transiting automatically. Applicapable to motorized instruments with auto targeting system only.
	Re-measure Horizontal bearing.
	Re-measure Face Left (Horizontal Bearing, Vertical Angle, Slope Distance)
	Re-measure Face Right (Horizontal Bearing, Vertical Angle, and Slope Distance).
	Re-measure Trav Dist. Re-measure Distance.
	View last use station.
	Switch menu bar
	Enter height button. Enter height details.
	Edit Station ID button. Update/Edit station IDs.
	Sketch button. To view sketch.
	View Field Book button. View the record in field book.
	Distance adjustment. To adjust the horizontal distance
	Station remark. Add remark to a specific station ID (E.g.: TP ke, TLH)
	Remark

ONLINE

dist	Measure Dist only button. Measure distance to online station.
	Reduce button. Reduces the measurement to produce mean, reduction and final value. 'Dpi' will be auto calculated and displayed.
	Save button. Set save index to save measurement to database.
	Sketch button. To view sketch.
	POL Tape button.
	View Field Book button. View the record in field book.
lasT stn	View Last Stn button. Provide a list of 20 mostly used stn ID
Dist adj.	Distance adjustment. To adjust the horizontal distance

BEARING CLOSE
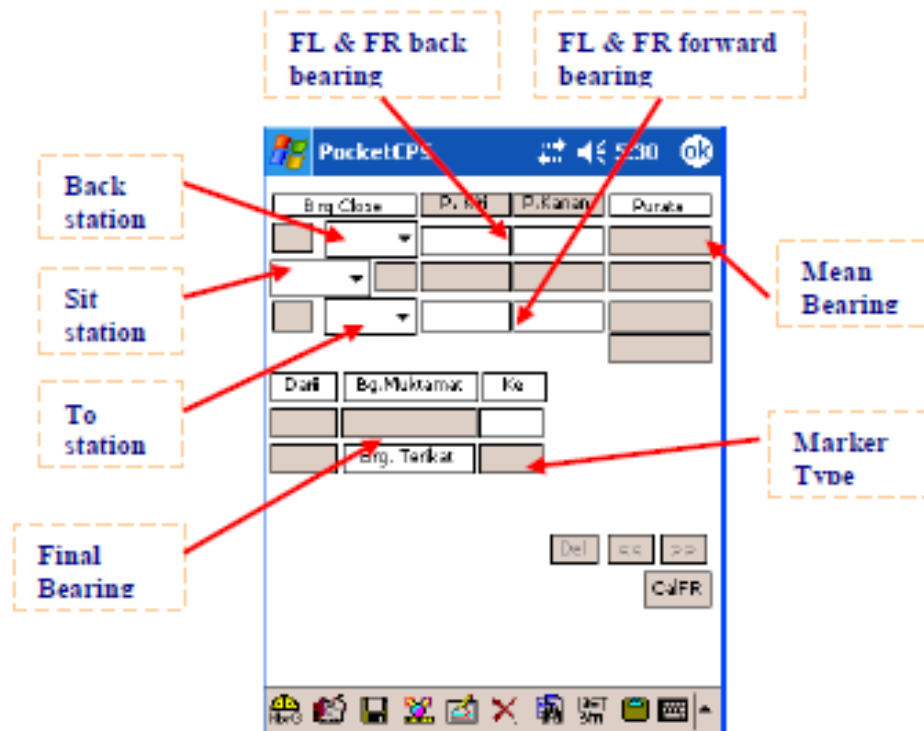
Icon	Description
	Measure horizontal bearing button. Measures Face Left the first time and Face Right for the second time
	Reduce button. Reduces the measurement to produce mean, reduction and final value.
	Save button. Set save index to save measurement to database.
	Measure All button. Measures both face left and face right measurements transiting automatically. Applicapable to motorized instruments with auto targeting system only.
	Sketch button. To view sketch.
	Delete button. Deletes the record (applicable during view record mode).
	View Field Book button. View the record in field book.
	View Last Stn button. Provide a list of 20 mostly used stn ID
	Remark

CLOSE STATEMENT

		Reduce button. Reduces the measurement to produce mean, reduction and final value. Close bearing and should close bearing will be automatically retrieved and displayed with the misclosure and correction per stations calculated. If no station route has been entering, user is provided a list of route to select from.
		Save button. Set save index to save measurement to database.
		Provides a dialog with all available stations to pick and connect as station route.
		Provides a dialog with all available PO line bearings to select as "Should close bearing".
		Provides a dialog with all available Sun mean grid bearings to select as "Should close bearing".
		Info button. Either solar or user. You can put a remark there.

		Delete button. Deletes the record (applicable during view record mode).
		View Field Book button. View the record in field book.
		Switch menu bar
		Sketch button. To view sketch.
		View Last Stn button. Provide a list of 20 mostly used stn ID
		Remark

CHECK ANGLE DIST

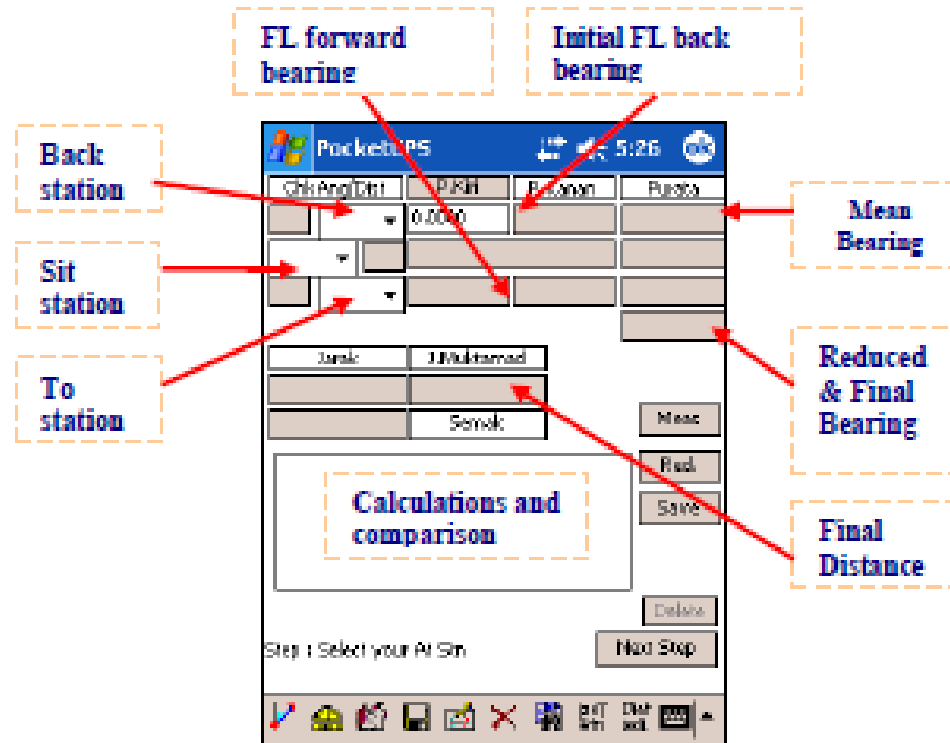|	
	Set bearing button. Sets traverse line reference bearing to the instrument and displayed.
	Measure button. Measures Face Left forward bearing and distance.
	Reduce button. Reduces the measurement to produce mean, reduction and final value.

	Comparison between computed and true line bearing and distance will be shown.
	Save button. Set save index to save measurement to database.
	Sketch button. To view sketch.
	Delete button. Deletes the record (applicable during view record mode).
	View Field Book button. View the record in field book.
	View Last Stn button. Provide a list of 20 mostly used stn ID

CHECK DISTANCE

dist	**Measure Dist only button**. Measure distance to online station.
	Reduce button. Reduces the measurement to produce mean, reduction and final value. Comparism between computed and true line distances will be shown.
	Save button. Set save index to save measurement to database.
	Sketch button. To view sketch.
X	**Delete button**. Deletes the record (applicable during view record mode).
	View Field Book button. View the record in field book.
Lst Stn	**View Last Stn button**. Provide a list of 20 mostly used stn ID

Setting out by coordinate

- Compute Bearing Distance from 2 coordinate
- Import adjusted coordinate from SUM

OFFSET DETAILS
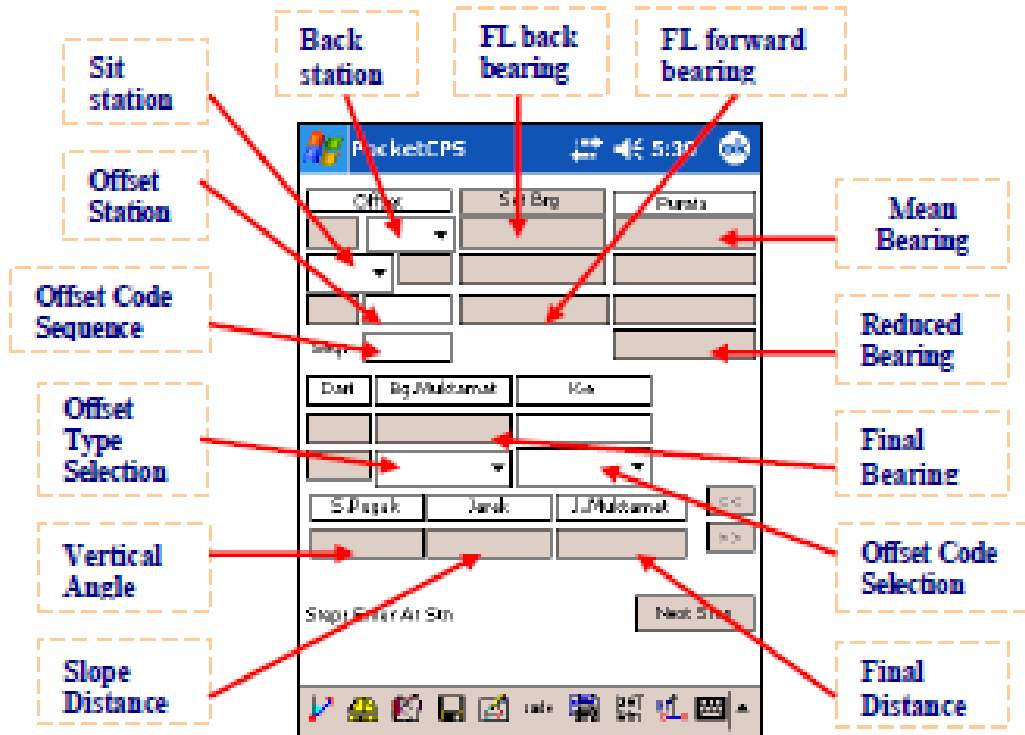
	Set bearing button. Sets back reference line bearing to the instrument and displayed.
	Measure button. Measures Face Left.
	Reduce button. Reduces the measurement to produce mean, reduction and final value
	Save button. Set save index to save measurement to database.
	Sketch button. To view sketch.
code	**Code button**. Code list for details.
	View Field Book button. View the record in field book.
	View Last Stn button. Provide a list of 20 mostly used stn ID

CORRECTION
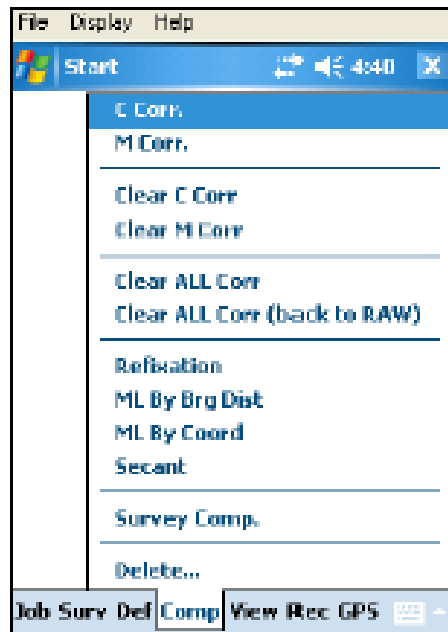
C Corr.	To perform Closure Correction.
M Corr.	To perform Meridian Correction.
Clear C Corr...	To clear Closure corrections accordingly starting from particular record.
Clear M Corr...	To clear Meridian corrections accordingly starting from particular record.
Clear All Corr	To CLEAR all M Corr and C Corr.
Clear All Corr (back to RAW)	To CLEAR all M Corr and C Corr and make the data back to RAW
Refixation	To perform Refixation.
ML by Brg Dist	To compute Missing Line by Bearing and Distance.
ML by Coord	To compute Missing Line by Coordinates.
Secant	To compute bearing and distance of the Secant Line of a road reserve survey.
Survey Comp.	To perform Survey Computation.
Delete... Remove All PO Line Remove All Missing Line Remove SKL Line Remove Dead Stn	Selection of delete functions: • Remove All PO Line • Remove All Missing Line • Remove SKL Line • Remove Dead Stations (unlink stations).

C CORRECTION

At station → At Stn.
To station → To Stn.
Correction station list
Tikaian that to be apply → Tikaian

Close Statement List :
1 -   2 2,3,4,6,1
7 -   3 8,11,12,7

Close Statement List

At Stn. 1   To Stn. 2
Station
2,3,4,6,1
Tikaian: 0.0021   Apply

Close Statement List :
1 -   2 2,3,4,6,1
7 -   3 8,11,12,7
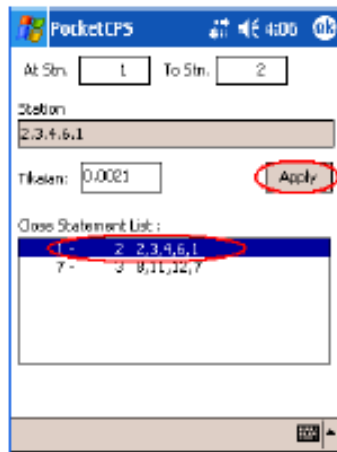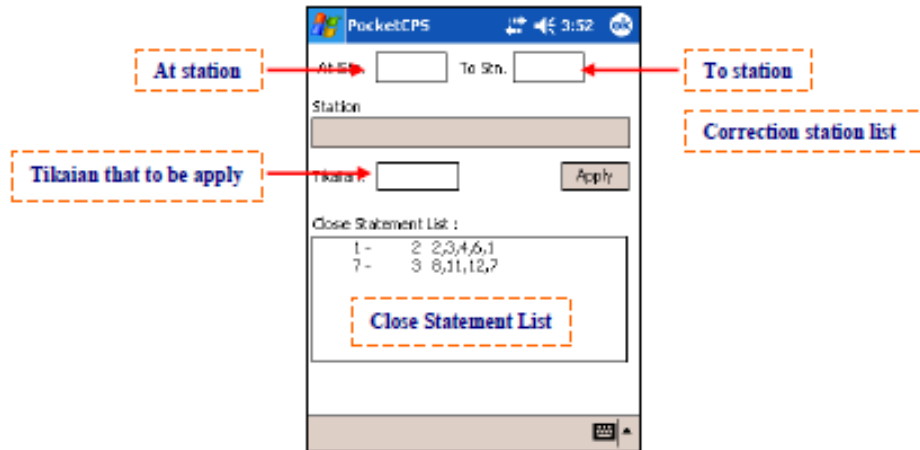
1. Navigate to **Comp** > **C Corr**. A C Corr screen will be displayed.

2. Select the close statement list that you want to apply the C Correction by just double tab the selected close statement. Then tab **Apply** button. So, the C Correction is done.

3. You can view the applied C correction at field book. Please Navigate to **Rec** > **View Field Book**.

M CORRECTION
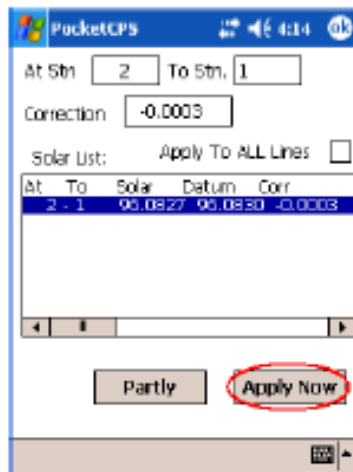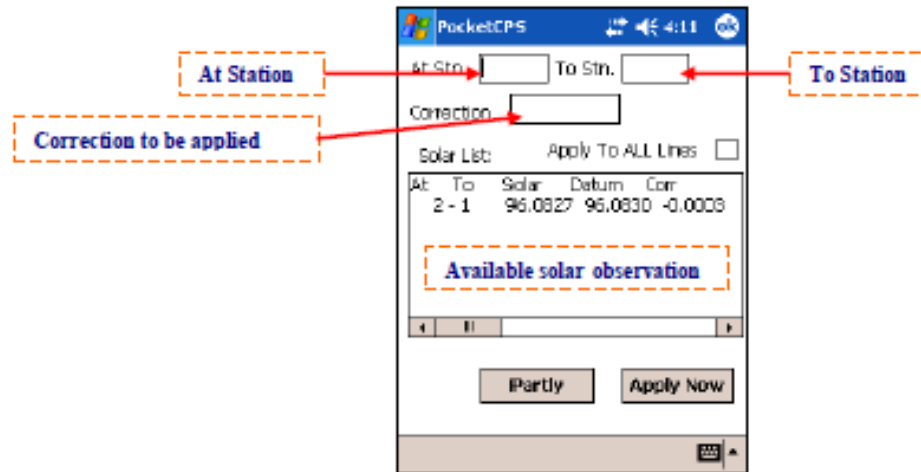
1. Navigate to **Comp > M Corr**. An **M Corr** dialog will be displayed.

2. Select the sun list that you did for Sun Observation. Apply the C Correction by just double the 2-1.

3. Change the **At Stn** and **To Stn** where you want to start apply the M Correction if needed. Then tab **Apply Now** button. So, the M Correction is done.

4. You can view the applied M correction at field book. Please Navigate to Rec > View Field Book.

BASE COMPUTATION & REFIXATION

New	Auto retrieves the *New Station route* according to New AtStn and ToStn input and computes the bearing and distances. Difference between PO and New will be auto compute and displayed respectively.
PO	Auto retrieves the *PO Station route* according to PO AtStn and ToStn input and computes the bearing and distances.
Recompute	To re-computes if users has make changes to its routes.
Search New	Search more function to search more traverse route.
Search PO	Search more function to search more PO route.
LOG	View Logged Base information.
Cal.	View Calculation of the particular baseline.

| Button	Description
New	Auto retrieves the *New Station route* according to New AtStn and ToStn input and computes the bearing and distances. Difference between PO and New will be auto compute and displayed respectively.
PO	Auto retrieves the *PO Station route* according to PO AtStn and ToStn input and computes the bearing and distances.
Recompute	To re-computes if users has make changes to its routes.
Search New	Search more function to search more traverse route.
Search PO	Search more function to search more PO route.
LOG	View Logged Base information.
Cal.	View Calculation of the particular baseline.

Button	Description
Select Route	View the calculation for that new / PO traverse route when more than 1 new traverse route is showed in list.
Clear	Clear all fields.
Log	Log the base before adjusting PO value.
Save	From the log file, choose the best base and save it.
Adjust & Refix	Perform base adjustment when user finds the results are within tolerance. After completing base calculation, do the refixation for the missing mark.

DEFINITION MENU
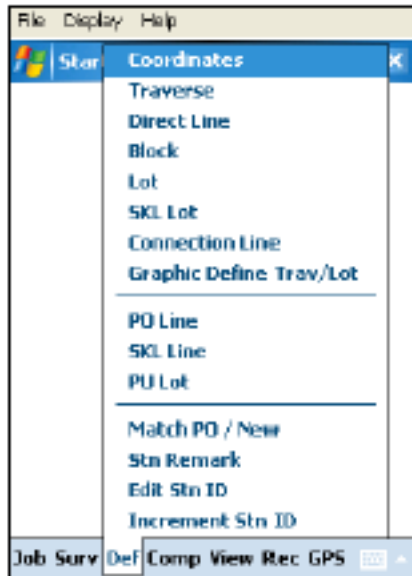
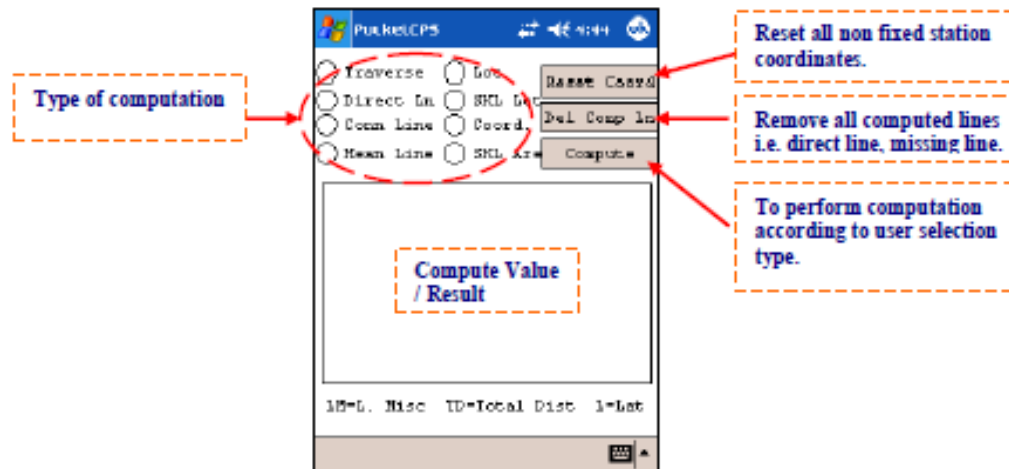|	
Coordinates	To view and define fixed coordinates.
Traverse	To define Traverse.
Direct Line	To define Direct Line.
Block	To define a block of lots
Lot	To define Lot.
SKL Lot	To view defined imported SKL Lot.
Connection Line	To define Connection Line.
Graphic Define Trav/Lot	To graphically define Traverse and Lot by graphic picking.
Line Entry	To enter/create a new line.
PO Line	To enter the PO lines
SKL Line	To enter the SKL Lines
PU Lot	To Check PU ASCII return information
Match PO/New	To match (transpose) and view existing matches between PO and new stations.
Stn Remark	To put station remark.
Edit Stn ID	To edit the station ID
Increment Stn ID	To increase the station id numbering from particular number.

Survey computation

- Survey computation functions to compute traverse misclosures including lot and coordinate calculations.

Type of computation → (radio buttons: Traverse, Direct Ln, Comn Line, Mean Line, Lot, SKL Lt, Coord., SKL Are)

Reset all non fixed station coordinates.

Remove all computed lines i.e. direct line, missing line.

To perform computation according to user selection type.
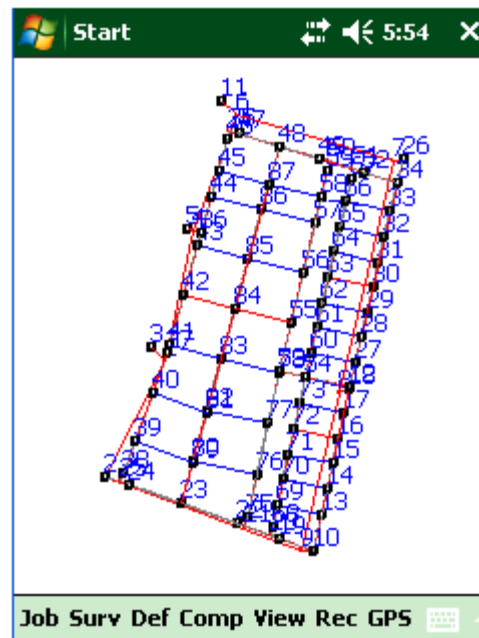
Compute Value / Result

1. Go to **Comp > Survey Comp**. to do all you computation.

2. Select the radio button for the type of survey you want to compute.

3. After select the type of computation, tab the **Compute** button

Field Sketch

- Field sketch or graphic view of survey observation is generated in real time for easy check and verification of survey observations in the field.

Field Book

- Field survey booking is done in real time at the touch of a button and eliminate the need for manual booking and significantly reduced the processing time.