

Bowditch Table is a novel introduction for the computation and adjustment of Traverse by Bowditch method. SMS computation is standardized on rigorous 2D/3D Least Squares adjustment programme. Nevertheless, there are occasions when non-rigorous solutions are satisfactory. The facility is available from toolbar, once a job and scheme has been selected, as normal in using SMS.

Stn	Back Bearing Obs Angle Fwd Bearing	Corr.	Red. Bearing	Distance	Prov Eastings. +/- dE Eastings	Prov Northings +/- dN Northings	Stn
	337°17'16"				26.927	2.058	
	108°20'30"				0.001	-0.000	
CG811A	85°37'46"	+00°03"	85°37'49"	27.005	26.928	2.058	PEG1
	265°37'46"				37.484	5.582	
	165°54'35"				0.003	-0.001	
PEG1	71°32'21"	+00°06"	71°32'27"	11.130	37.487	5.581	CG812
	251°32'21"				69.994	9.855	
	190°58'10"				0.004	-0.001	
CG812	82°30'31"	+00°09"	82°30'40"	32.790	69.998	9.854	CG813
	262°30'40"				76.416	-6.691	
	256°16'40"				0.005	-0.001	
CG813	158°47'20"	+00°02"	158°47'22"	17.749	76.421	-6.692	CG814

fig 1

Bowditch Table is a database, reflecting the management concepts of SMS. The interface is a model of typical traverse computation sheet. However, no input actual input or computation is performed in this form. Rather it serves the purpose of visualizing and following the computed results. Input is organised into Fixed Stations, Data, and Azimuths, with strict data validation. During computations, these lists feed into the form to generate the required results.

**Fixed Stations**

This is an input list dialog for storing control points in the database, fig 2. It also provides reference information on fixed stations during computations.

# SMS - BOWDITCH TABLE

Stn	Back Bearing	Corr.	Red. Bearing	Distance	Prov Eastings	Prov Northings	Stn
	Obs Angle				+/- dE	+/- dN	
	Fwd Bearing				Eastings	Northings	
A	228°27'34"			703.280	163877.915	104590.867	P1
	203°41'28"				0.062	0.076	
	72°09'02"	-00'03"	72°08'59"		163877.977	104590.943	
P1	252°09'02"				164264.525	104863.880	
	162°37'21"				0.123	0.152	

Station	S/N	Easting	Northing	Height
A	2	163208.490	104375.290	
AREF	4	163133.640	104308.974	
B	6	165074.490	105227.470	
BREF	8	165259.682	105302.995	

Counter: 6

Buttons: Load, File, Polar, Okay

fig 2

Stn	Back Bearing	Corr.	Red. Bearing	Distance	Prov Eastings	Prov Northings	Stn
	Obs Angle				+/- dE	+/- dN	
	Fwd Bearing				Eastings	Northings	
CG811A	337°17'16"			27.005	26.927	2.058	PEG1
	108°20'30"				0.001	-0.000	
	85°37'46"	+00'03"	85°37'49"		26.928	2.058	
11	265°37'46"				37.484	5.582	
PEG1							CG812
CG812							CG813
CG813							CG814
Fixed Stns							OK

Start of Traverse		End of Traverse	
Ref. Station		Fwd. Station	
B1		B1	
Instr. Station	S/N	Red. Angle	Hz. Distance
CG811A	2	108.2030	27.005
PEG1	4	165.5435	11.130
CG812	6	190.5810	32.790
CG813	8	256.1640	17.749
CG814	10	267.0020	39.440
CG815	12	179.4933	27.965

Counter: 6

Buttons: OK

fig 3

## Data Input

This is a list of reduced observations, angle and distance at each instrument station. It includes list-box of fixed stations to identify the first and last target stations, during the start and close of the traverse, fig 3.

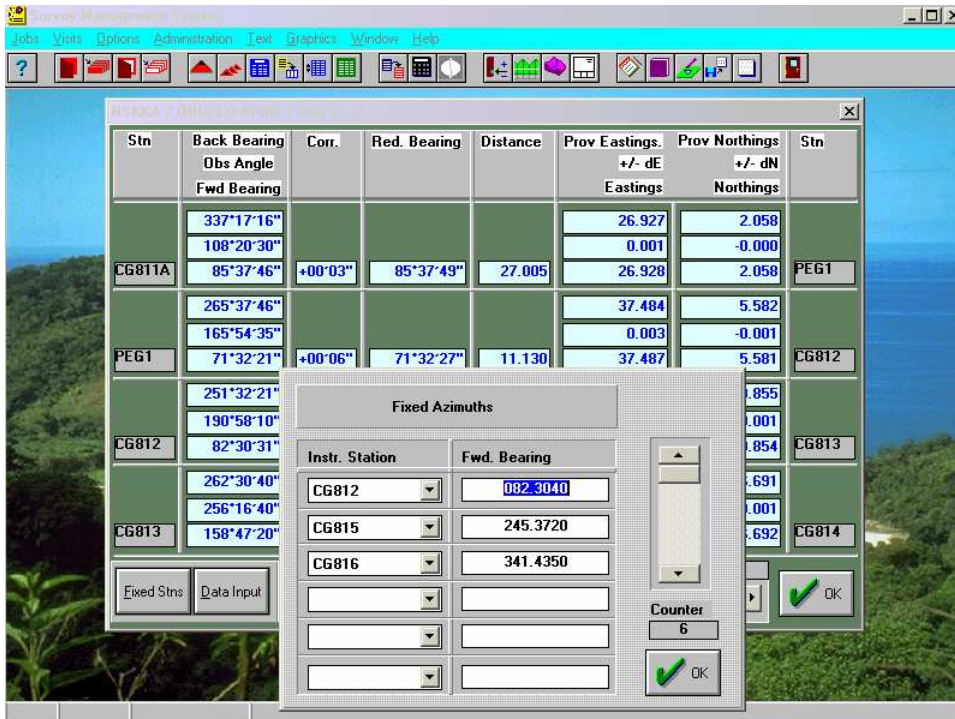


fig 4

## Azimuths

It is common to steer traverse lines to fixed azimuths in long surveys. These azimuths are available from gyro-theodolites and sun observations. The facility here incorporates such observations into computations. All that is required is to select the instrument station and enter the observation, fig 4. There is no limit to the number of azimuth stations, so that errors in long traverse surveys are reduced to a minimum.

## Computation

Computation is ready once the above input lists have been completed. Process button activates the computation, generates a list of results and refreshes the Table sheet. Each computation process involves pre-analysis to determine the type of traverse. It handles closed traverse as well as open traverse, where the last instrument station is unknown. It can also cope with awkward situations to provide users with a versatile and reliable solution.

## **SMS - BOWDITCH TABLE**

There is no limit to the number of stations in the traverse. Nor is the computation limited to a single traverse run. Each run is a page of information within the database. It may be part of the same network or even a different network, that is, under the same job index. Results of previous pages – surveys, are available for reference as starting point in the current traverse.

### **Conclusion**

Bowditch Table is another utility and welcome addition to the options available in survey computations. It is a dynamic and versatile database and useful in reviewing computation sheets of survey records.