

**Tripod Data Systems, Inc.
Raw Data Record Specification
Survey Pro[™] Version 3.6**

October 2, 2002

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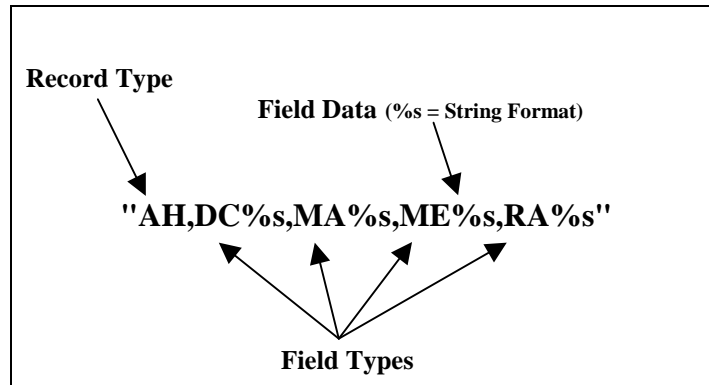
Table of Contents

Records and Fields	1
General Raw Data Records	2
Conventional Raw Data Records	2
GPS Raw Data Records	2
Legacy Raw Data Records.....	3
General Raw Data Record Definitions.....	4
1. -- - Note Record.....	4
2. JB - Job Record	4
3. MO - Mode Setup Record.....	4
Conventional Raw Data Record Definitions.....	5
4. AP - Adjusted point record.....	5
5. AT – Attributes.....	5
6. BK - Backsight Record	5
7. CF - Cut Sheet Record	5
8. DE - Design point / location record	6
9. DL - Define a Location Record.....	6
10. DP - Deleted point record.....	6
11. FC – Feature Code.....	6
12. LS - Line of Sight Record	7
13. MD – Multiple Distance.....	7
14. OC - Occupy Point Record.....	7
15. OE - Offset delta record	7
16. OF - Off Center Shot Record	7
17. RB – Repeat Backsight	8
18. RD – Repeat Directional	8
19. RE - Remote Elevation Record	9
20. RF – Repeat Foresight.....	9
21. RS - Resection Record	9
22. SD - Deltas record.....	9
23. SK - Stake Out Record.....	10
24. SL - Slope Staking Record.....	10
25. SP - Store Point Record.....	10
26. SR - Slope Staking Reference Offset Record.....	11
27. SU - Sun Shot Record	11
28. TR/SS/OB - Traverse / Sideshot / Observation Record	12
GPS Raw Data Record Definitions.....	13
29. AH - GPS Antenna Height.....	13
30. BL - GPS Base Line.....	13
31. BP - Set Base Receiver Position	13
32. CG – COGO Settings record.....	13
33. CS - Coordinate System Identity.....	14
34. CT - Calibration Point.....	14
35. CV - RMS Covariance of GPS Position.....	14
36. DG - Datum Grid Record	14

37.	DT - Datum Record.....	15
38.	EE - GPS Edit Point Record.....	15
39.	EP - Geodetic position.....	15
40.	EQ - Equipment Record.....	16
41.	ES - Ellipsoid Record.....	16
42.	GK - GPS stakeout record.....	16
43.	GO - GPS Offset Shot Record.....	16
44.	GP - GPS Point Record.....	17
45.	GR – GPS adjusted point record.....	17
46.	GS - GPS Store Point.....	17
47.	HA - Horizontal Calibration (Adjust).....	17
48.	PE - Extended Projection Record.....	18
49.	PJ - Projection Record.....	18
50.	RP – Local coordinates of calibration point.....	18
51.	RX - Receiver Setup.....	19
52.	ST - Local site settings.....	19
53.	VA - Vertical Calibration (Adjust).....	19
Legacy Raw Data Record Definitions.....		20
54.	AA – Accumulating Angle-right.....	20
55.	BB - Bench level, backsight.....	20
56.	BG - Base Point Geoid Model Elevation.....	20
57.	BS - Bench level, side shots.....	20
58.	BT - Bench level, traverse.....	21
59.	HC - Horizontal Control Point.....	21
60.	LE - Vertical Ellipsoid Height Setup.....	21
61.	LG - Vertical Geoid Model Setup.....	21
62.	LM - Horizontal Mapping Plane Setup.....	22
63.	LH - Local transforming coefficients for horizontal.....	22
64.	LV - Local transforming coefficients for vertical.....	22
65.	VC - Vertical Control point.....	23
General and Conventional Field List.....		24
GPS Field List.....		26
Legacy Field List.....		31

Records and Fields

General Record Description:



Notes:

- Raw data records are comma delimited and in ASCII text format.
- In the Record Definitions, an (ENUM) after a field name means this field is an enumeration type field (i.e. 0 = blue, 1 = red, etc.). These fields are described in the Field Lists section.
- Field data types are also described in the Field Lists sections.
- Under the Description column in Field Lists, (See MO for units) refers to the actual "3. Mode Setup Record" of the corresponding raw file.

General Raw Data Records

1. -- - Note record
2. JB - Job Record
3. MO - Mode Setup Record

Conventional Raw Data Records

4. AP - Adjusted point record
5. AT - Attributes
6. BK - Backsight Record
7. CF - Cut Sheet Record
8. DE - Design point / location record
9. DL - Define a Location Record
10. DP - Deleted point record
11. FC - Feature Code
12. LS - Line of Sight Record
13. MD - Multiple Distances Record
14. OC - Occupy Point Record
15. OE - Offset delta record
16. OF - Off Center Shot Record
17. RB - Repeat Backsight
18. RD - Repeat Directional
19. RE - Remote Elevation Record
20. RF - Repeat Foresight
21. RS - Resection Record
22. SD - Deltas record
23. SK - Stake Out Record
24. SL - Slope Staking Record
25. SP - Store Point Record
26. SR - Slope Staking Reference Offset Record
27. SU - Sun Shot Record
28. TR/SS/OB - Traverse / Sideshot / Observation Record

GPS Raw Data Records

29. AH - GPS Antenna Height
30. BL - GPS Base Line
31. BP - Set Base Receiver Position
32. CG - COGO settings record
33. CS - Coordinate System Identity
34. CT - Calibration Point
35. CV - RMS Covariance of GPS Base Line
36. DG - Datum Grid Record
37. DT - Datum Record
38. EE - GPS Edit Point Record
39. EP - Geodetic position
40. EQ - Equipment Record
41. ES - Ellipsoid Record

42. GK - GPS stakeout record
43. GO - GPS Offset Shot Record
44. GP - GPS Point Record
45. GR - GPS adjusted point record
46. GS - GPS Store Point
47. HA - Horizontal Calibration (Adjust)
48. PE - Extended Projection Record
49. PJ - Projection Record
50. RP - Local coordinates of calibration point
51. RX - Receiver Setup
52. ST - Local site settings
53. VA - Vertical Calibration (Adjust)

Legacy Raw Data Records

(Not used in Survey Pro 3.5 and beyond)

54. AA - Accumulating Angle-right (not used in SPCE)
55. BB - Bench level, backsight (not used in SPCE)
56. BG - Base Point Geoid Model Elevation (no longer supported in SPCE 3.5, replaced by VA record)
57. BS - Bench level, side shots (not used in SPCE)
58. BT - Bench level, traverse (not used in SPCE)
59. HC - Horizontal Control Point (not supported in SPro 3.5, replaced with CT)
60. LE - Vertical Ellipsoid Height Setup
61. LG - Vertical Geoid Model Setup (no longer supported in SPCE3.5)
62. LM - Horizontal Mapping Plane Setup (no longer supported in SPCE3.5)
63. LH - Local transforming coefficients for horizontal (no longer supported in SPCE3.5 and replaced by Horizontal adjustment record HA)
64. LV - Local transforming coefficients for vertical (no longer supported in SPCE3.5 and replaced by Vertical adjustment record VA)
65. VC - Vertical Control point (not supported in SPro 3.5, replaced with CT)

General Raw Data Record Definitions

1. -- - Note Record

2. JB - Job Record

Record type: JB

Field headers:

NM: Job name

DT: Date

TM: Time

“JB,NM%s,DT%s,TM%s”

3. MO - Mode Setup Record

The mode setup will be recorded at the beginning of the raw data file and whenever it is changed.

Record type: MO

Field headers:

AD: Azimuth direction (ENUM)

UN: Distance unit (ENUM)

SF: Scale factor

EC: Earth curvature (ENUM)

EO: EDM offset (inch) (Default string “0.0”)

AU: Angle unit (ENUM)

“MO,AD%s,UN%s,SF%s,EC%s,EO0.0,AU%s”

Conventional Raw Data Record Definitions

4. AP - Adjusted point record

Record type: AP

Field headers:

PN: Point name

N : Adjusted northing

E : Adjusted easting

EL: Adjusted elevation

--: Description

“AP,PN%s,N %s,E %s,EL%s,--%s”

5. AT – Attributes

Record type: AT

Field headers:

TN: Attribute name

TV: Attribute value in string form

“AT,TN%s,TV%s”

6. BK - Backsight Record

Record type: BK

Field headers:

OP: Occupy point

BP: Back point

BS: Backsight

BC: Back circle

“BK,OP%s,BP%s,BS%s,BC%s”

7. CF - Cut Sheet Record

Record type: CF (cut or fill)

For an offset stakeout cut sheet

ST: Station

OD: Offset direction (ENUM)

OL: Offset length

EL: Elevation

GD: Grade (design)

“CF,ST%s,OD%s,OL%s,EL%s,GD%s”

For a point stakeout cut sheet

PN: Point number

EL: Elevation

GD: Grade

“CF,PN%s,EL%s,GD%s”

Note: From Survey Pro CE 3.5, the PN field and description field are removed from CF record for point stake out.

8. DE - Design point / location record

Record type: DE

Field headers:

PN: Point name (*design point, may be blank*)

N : Northing

E : Easting

EL: Elevation

--: Description (*design point description, may be blank*)

“DE,PN%s,N %s,E %s,EL%s,--%s”

9. DL - Define a Location Record

Record type: DL

Field headers:

PN: Point name (POB)

HD: Relative horizontal distance

VD: Relative vertical distance

AZ: Azimuth

--: Description of the stored point.

“DL,PN%s,HD%s,VD%s,AZ%s,--%s”

10. DP - Deleted point record

Record type: DP

Field headers:

PN: Point name

“DP,PN%s”

11. FC – Feature Code

Record type: FC

Field headers:

PN: Point name

FN: Feature code name (may be blank)

“FC,PN%s,FN%s”

12. LS - Line of Sight Record

Record type: LS

Field headers:

HI: Height of instrument

HR: Height of rod

“LS,HI%s,HR%s”

13. MD – Multiple Distance

Record type: MD

Field headers:

SD: Slope distance

“MD,SD %s:%s”

14. OC - Occupy Point Record

Record type: OC

Field headers:

OP: Point number

N : Northing (the header is N space)

E : Easting (the header is E space)

EL: Elevation

--: Description

“OC,OP%s,N %s,E %s,EL%s,--%s”

15. OE - Offset delta record

Record type: OE

Field headers:

ST: Station

OE: Offset delta (*actual offset – design offset*)

“OE,ST%s,OE%s”

16. OF - Off Center Shot Record

Record type: OF

Field headers:

AR: Angle right

ZE: Zenith

SD: Slope distance

OL: Offset length

HD: Horizontal distance

VD: Vertical distance

LR: Left/Right Offset

“OF,AR%s,ZE%s,SD%s”
“OF,ZE%s,--Vert Angle Offset”
“OF,OL%s,--Right Angle Offset”
“OF,HD%s,--Horizontal Distance Offset”
“OF,LR%s,--Left / Right Offset”
“OF,VD%s,--Elevation Offset”

17. RB – Repeat Backsight

Record type: RB (repeat backsight)

Field headers:

OP: Occupied point
BP: Backsight point
AR: Angle right
ZE: Zenith angle
SD: Slope distance
HR: Height of rod at the backsight
--: Description

“RB,OP%s,BP%s,AR%s,ZE%s,SD%s,HR%s,--%s”

18. RD – Repeat Directional

Record type: RD

Field headers:

BD: Backsight direct
FD: Foresight direct
ZD: Zenith direct
FV: Foresight reverse
ZV: Zenith reverse
BV: Backsight reverse

“RD,FD %s:%s”
“RD,FV %s:%s”
“RD,BD %s:%s”
“RD,BV %s:%s”
“RD,ZD %s:%s”
“RD,ZV %s:%s”

//The data before the colon (:) is the integer set number and the data after the colon is the angle measurement. See MO record for angle units.

19. RE - Remote Elevation Record

Record type: RE
Field headers:
OP: Occupied point
FE: Foresight elevation
ZE: Zenith angle
SD: Slope distance
--: (always "Remote elev")

"RE,OP%s,FE%s,ZE%s,SD%s,--%s"

20. RF – Repeat Foresight

Record type: RF (repeat foresight)
Field headers:
OP: Occupied point
FP: Foresight point
AR: Angle right
ZE: Zenith angle
SD: Slope distance
HR: Height of rod at the foresight
--: Description

"RF,OP%s,FP%s,AR%s,ZE%s,SD%s,HR%s,--%s"

21. RS - Resection Record

Record type: RS
Field headers:
PN: Point number
CR: Circular reading
ZE: Zenith (or VA, CE)
SD: Slope distance (or HD)

"RS,PN%s,CR%s,ZE%s,SD%s" // A resection with angles and distance

"RS,PN%s,CR%s" // A resection with angles only

22. SD - Deltas record

Record type: SD
Field headers:
ND: Delta northing
ED: Delta easting
LD: Delta elevation

"SD,ND%s,ED%s,LD%s"

23. SK - Stake Out Record

Record type: SK

Field headers:

OP: Occupy point

FP: Foresight point

AR: Angle right

ZE: Zenith

SD: Slope distance

“SK,OP%s,FP%s,AR%s,ZE%s,SD%s,--%s”

Note: FP field used to record design point name. Starting from SPCE3.5, it records the actual point name. It also may be blank if there is no actual point stored.

24. SL - Slope Staking Record

Record type: SL

Field headers:

ST: Station

OD: Offset direction (ENUM)

EL: Actual catch point elevation

GD: Grade (design elevation of the catch point based on the slope line)

AS: Ahead on station (positive when rod is beyond design station, negative when before station)

HH: Horizontal distance to hinge point (always positive)

VH: Vertical distance to hinge point (positive when rod is above hinge)

HC: Horizontal distance to center line (always positive)

VC: Vertical distance to center point (positive when rod is above center point)

CF: Slope used (ENUM)

DS: Design slope

OB: Observed slope

“SL,ST%s,OD%s,EL%s,GD%s,AS%s,HH%s,VH%s,HC%s,VC%s,CF%s,DS%s,OB%s”

25. SP - Store Point Record

Record type: SP

Field header:

PN: Point number

N: Northing

E: Easting

EL: Elevation

--: Description

“SP,PN%s,N %s,E %s,EL%s,--%s”

26. SR - Slope Staking Reference Offset Record

Record type: SR

Field headers:

ST: Station

OD: Offset direction (ENUM)

EL: Actual elevation

GD: Grade (design elevation, corresponds to the elevation of the found catch point)

AS: Ahead on station (positive when rod is beyond design station, negative when before station)

HH: Horizontal distance to hinge point (always positive). This distance includes the reference offset.

VH: Vertical distance to hinge point (positive when rod is above hinge)

HC: Horizontal distance to center line (always positive). This distance includes the reference offset.

VC: Vertical distance to center point (positive when rod is above center point)

CF: Slope used (ENUM)

DS: Design slope

OB: Observed slope at the catch point

OL: Offset length from the catch point

“SR,ST%s,OD%s,EL%s,GD%s,AS%s,HH%s,VH%s,HC%s,VC%s,CF%s,DS%s,OB%s,OL%s”

27. SU - Sun Shot Record

Record type: SU

//For a sun shot setup

GH: Greenwich hour angle (GHA 0)

GH: Greenwich hour angle (GHA 24)

DE: Declination (DECL 0)

DE: Declination (DECL 24)

SM: Semi-diameter of Sun (in DMS)

DT: Local date (See General and Conventional Field List)

TM: Local time (See General and Conventional Field List)

//For the actual sun shot

BD: Backsight direct

FD: Foresight direct

FV: Foresight reverse

BV: Backsight reverse

LA: Latitude

LO: Longitude

EG0: Left trailing edge sun position

EG1: Right trailing edge sun position

EG2: Center sun position

“SU,GH% s,GH% s,DE% s,DE% s,SM% s”

“SU,DT% 02s% 02s% 04s”

“SU,LA% s,LO% s,EG% s”

“SU,TM% s”

“SU,% s% s% s” // Will write BD,BV or FD,FV with an angle measurement. See MO record for angle units.

28. TR/SS/OB - Traverse / Sideshot / Observation Record

Record type: TR / SS / OB

Field headers:

OP: Occupy point

FP: Foresight point

(one of the following)

AZ: Azimuth

AR: Angle right

AL: Angle left

(one of the following pair)

ZE: Zenith

SD: Slope distance

(or)

CE: Change elevation

HD: Horizontal distance

--: Description

“TR,OP% s,FP% s,AR% s,ZE% s,SD% s,--% s”

“SS,OP% s,FP% s,AR% s,ZE% s,SD% s,--% s”

“OB,OP% s,FP% s,AR% s,ZE% s,SD% s,--% s”

GPS Raw Data Record Definitions

29. AH - GPS Antenna Height

Record type: AH

Field headers:

DC: Derivation Code (ENUM)

MA: Measured antenna height

ME: Measure Method (ENUM)

RA: Reduced antenna height (to phase center)

“AH,DC%s,MA%s,ME%s,RA%s”

30. BL - GPS Base Line

Record type: BL

Field headers:

DC: Derivation

PN: Point Name

DX: Base line Delta X

DY: Base line Delta Y

DZ: Base line Delta Z

-- : Description (Feature Code)

GM: GPS Measure Method (ENUM)

CL: Classification

HP: Horizontal Precision

VP: Vertical Precision

“BL,DC%s,PN%s,DX%s,DY%s,DZ%s,--%s,GM%s,CL%s,HP%s,VP%s”

31. BP - Set Base Receiver Position

Record type: BP

Field headers:

PN : Point Name

LA: Latitude

LN: Longitude

HT: Ellipsoid Height

SG: Setup Group (default = 0)

“BP,PN%s,LA%s,LN%s,HT%s,SG%s”

32. CG – COGO Settings record

Record type: CG

Field headers:

AO: Azimuth Orientation (ENUM)

GO: Grid Orientation (ENUM)

“CG,AO%s,GO%s”

33. CS - Coordinate System Identity

Record type: CS

Field headers:

CO: Coordinate system option (ENUM)

ZG: Zone group (system) name

ZN: Zone name

DN: Datum name

“CS,CO%s,ZG%s,ZN%s,DN%s”

34. CT - Calibration Point

Record type: CT

Field headers:

PN: Point Name

DM: Dimensions used (ENUM)

RH: Horizontal residual

RV: Vertical residual

“CT,PN%s,DM%s,RH%s,RV%s”

35. CV - RMS Covariance of GPS Position

Record type: CV

Field headers:

DC: Derivation (ENUM)

SV: Minimum number of SV during observation

SC: Error Scale

XX: Variance X

XY: Covariance X,Y

XZ: Covariance X,Z

YY: Variance Y

YZ: Covariance Y,Z

ZZ: Variance Z

“CV,DC%s,SV%s,SC%s,XX%s,XY%s,XZ%s,YY%s,YZ%s,ZZ%s”

36. DG - Datum Grid Record

Record type: DG

Field headers:

FI: File name

“DG,FI%s”

37. DT - Datum Record

Record type: DT

Field headers:

DA: Type of datum (ENUM)
RD: Ellipsoid radius
IF: Ellipse inverse flattening
OX: Rotation x
OY: Rotation y
OZ: Rotation z
LX: Translation x
LY: Translation y
LZ: Translation z
SP: Scale factor in ppm

“DT,DA%s,RD%s,IF%s,OX%s,OY%s,OZ%s,LX%s,LY%s,LZ%s,SP%s”

38. EE - GPS Edit Point Record

Record type: EE

Field headers:

GF: Geodetic Flags (ENUM)
SG: Setup Group

“EE,GF%s,SG%s”

39. EP - Geodetic position

(When a point is stored, its geodetic position is recorded.)

Record type: EP

Field headers:

TM: Time
LA: Latitude
LN: Longitude
HT: Ellipsoid Height
RH: Horizontal RMS returned from receiver
RV: Vertical RMS returned from receiver
DH: HDOP if receiver returns this info
DV: VDOP if receiver returns this info
GM: GPS Method (ENUM)
CL: Classification (ENUM)

“EP,TM% s: % s: % s,LA% s,LN% s,HT% s,RH% s,RV% s,DH% s,DV% s,GM% s,CL% s”

“EP,TM% s: % s: % s,LA% s,LN% s,HT% s,RH% s,RV% s,GM% s,CL% s”

40. EQ - Equipment Record

Record type: EQ

Field headers:

DC: Derivation Code (ENUM)

RX: Rx Type

RS: Rx Serial Number

AN: Antenna Number (from Antenna.ini)

AI: Antenna Index (measure to index from antenna.ini)

AT: Antenna Type (name of antenna)

TS: Antenna Serial Number

TA: Tape Adjustment

HO: Horizontal Offset

VO: Vertical Offset

“EQ,DC%s,RX%s,RS%s,AN%s,AI%s,AT%s,TS%s,TA%s,HO%s,VO%s”

41. ES - Ellipsoid Record

Record type: ES

Field headers:

RD : a - radius of semi major

IF: 1/f - inverse flattening

EM: Name - ellipse name

“ES,RD%s,IF%s,EM%s”

42. GK - GPS stakeout record

Record type: GK

Field headers:

PN: Point name (*actual point, may be blank*)

N : Northing

E : Easting

EL: Elevation

--: Description (*actual point description, may be blank*)

“GK,PN%s,N %s,E %s,EL%s,--%s”

43. GO - GPS Offset Shot Record

Record type: GO

Field headers:

PN: Point Name

AZ: Azimuth

ZE: Zenith Angle

SD: Slope Distance

HI: Height of laser at GPS reference point

HR: Height of laser target at store offset point

--: Description

“GO,PN%s,AZ%s,ZE%s,SD%s,HI%s,HR%s,--%s”

44. GP - GPS Point Record

Record type: GP

Field headers:

PN: Point Name

PT: Point Type (ENUM)

“GP,PN%s,PT%s”

45. GR – GPS adjusted point record

Record type: GR

Field headers:

N : Northing

E : Easting

EL: Elevation

-- : Description

“GR,PN%s,N %s,E %s,EL%s,--%s”

46. GS - GPS Store Point

(The GS record is similar to the SP record, which records the coordinate of a point. This record identifies the point is created by GPS.)

Record type: GS

Field headers:

PN: Point Name

N : Local Northing

E : Local Easting

EL: Local Elevation

-- : Description

“GS,PN%s,N%s,E%s,EL%s,--%s”

47. HA - Horizontal Calibration (Adjust)

Record type: HA

Field headers:

N : Origin north

E : Origin east

TH: Translation north

TE: Translation east

RT: Rotation about origin

SF: Scale factor at origin

“HA,N %s,E %s,TH%s,TE%s,RT%s,SC%s”

Note: all the fields may be blank if there is no adjustment done.

48. PE - Extended Projection Record

Record type: PE

Field headers:

TP: Type of projection (ENUM)

LA: Latitude of origin

LN: Longitude of origin

HT: Height of origin

N : Origin north

E : Origin east

EL: Origin elevation

SC: Scale factor

OO: Orientation one

OT: Orientation two

CT: Origin center (ENUM)

AF: Azimuth format (ENUM)

RY: Rectify

AE: Area (ENUM)

FO: File name one

FT: File name two

“PE,TP%s,LA%s,LN%s,HT%s,N %s,E %s,EL%s,SC%s,OO%s,OT%s, CT%s,
AF%s,RY%s,AE%s,FO%s,FT%s”

49. PJ - Projection Record

Record type: PJ

Field headers:

TP: Type of projection (ENUM)

LA: Latitude of origin

LN: Longitude of origin

HT: Height of origin

N : Origin north

E : Origin east

EL: Origin elevation

SC: Scale factor

OO: Orientation one

OT: Orientation two

“PJ,TP%s,LA%s,LN%s,HT%s,N %s,E %s,EL%s,SC%s,OO%s,OT%s”

50. RP – Local coordinates of calibration point

Record type: RP

Field headers:

N : Northing

E : Easting

EL: Elevation

-- : Description

“RP,PN%s,N %s,E %s,EL%s,--%s”

51. RX - Receiver Setup

Record type: RX

Field headers:

DC: Derivation Code (ENUM)

RA: Reduced antenna height (to phase centre)

RE: Recording interval in seconds

FI: Name of post processing file opened

“RX,DC%s,RA%s,RE%s,FI%s”

52. ST - Local site settings

Record type: ST

Field headers:

LA: Latitude

LN: Longitude

HT: Height

SC: Scale factor

N : Northing offset

E : Easting offset

“ST,LA%s,LN%s,HT%s,SC%s,N %s,E %s”

53. VA - Vertical Calibration (Adjust)

Record type: VA

Field headers:

PV: Type of vertical adjustment (ENUM)

N : Origin north (*may be blank*)

E : Origin east (*may be blank*)

LZ: Constant adjustment – translation Z (*may be blank*)

SO: Slope north (*may be blank*)

SA: Slope east (*may be blank*)

GN: Geoid Model Name

“VA,PV%s,N %s,E %s,LZ%s,SO%s,SA%s,GN%s”

Legacy Raw Data Record Definitions

These records are not used in Survey Pro version 3.5 and beyond.

54. AA – Accumulating Angle-right

Record type: AA

Field headers:

BC: Back circle

AR: Angle right

ZE: Zenith

SD: Slope distance

“AA,BC%s,AR%s,ZE%s,SD%s”

55. BB - Bench level, backsight

Record type: BB

Field headers:

PN: Backsight point

EL: BS elevation

ZE: Zenith

SD: Slope distance

-- : Description

“BB,PN%s,EL%s,ZE%s,SD%s,--%s”

56. BG - Base Point Geoid Model Elevation

(Replaced by Vertical adjustment record VA)

Record type: BG

Field headers:

PN: Point Name

HT: Ellipsoid Height

GU: Geoid Undulation at base

EL: Elevation of base

“BG,PN%s,HT%s,GU%s,EL%s”

57. BS - Bench level, side shots

Record type: BS

Field headers:

PN: FS point

ZE: Zenith

SD: Slope distance

-- : Description

“BS,PN%s,ZE%s,SD%s,--%s”

58. BT - Bench level, traverse

Record type: BT

Field headers:

PN: FS point

ZE: Zenith

SD: Slope distance

-- : Description

“BT,PN%s,ZE%s,SD%s,--%s”

59. HC - Horizontal Control Point

(When solving local transformation, each control point’s lat, long and height will be recorded.)

Record type: HC

Field headers:

PN: Point Name

LA: Latitude

LN: Longitude

HT: Ellipsoid Height

-- : Description

“HC,PN%s,LA%s,LN%s,HT%s,--%s”

60. LE - Vertical Ellipsoid Height Setup

(Replaced by the vertical adjust record VA)

Record type: LE

Field headers:

--: Description string

“LE,--%s”

61. LG - Vertical Geoid Model Setup

(Replaced by the vertical adjust record VA)

Record type: LG

Field headers:

GI: Geoid model index

“LG,GI%s”

62. LM - Horizontal Mapping Plane Setup
(Replaced by the projection records (ES,PJ,DT,CS))

Record type: LM

Field headers:

ME: Method

CS: Coordinate System

DA: Datum

ZO: Zone

HE: Hemisphere

FI: Custom file name (cs5 or pj5)

“LM,ME%s,CS%s,DA%s,ZO%s,HE%s,FI%s”

63. LH - Local transforming coefficients for horizontal
(Replaced by Horizontal adjustment record HA)

Record type: LH

Field headers:

PN: Point Name

Ha: Coefficient a

Hb: Coefficient b

Hc: Coefficient c

Hd: Coefficient d

SC: Scale

RT: Rotation

“LH,PN%s,Ha%s,Hb%s,Hc%s,Hd%s,SC%s,RT%s”

64. LV - Local transforming coefficients for vertical
(Replaced by Vertical adjustment record VA)

Record type: LV

Field headers:

PN: Point Name

Va: Coefficient a

Vb: Coefficient b

Vc: Coefficient c

Ba: Base Latitude

Bo: Base Longitude

Bh: Base Ellipsoid Height

“LV,PN%s,Va%s,Vb%s,Vc%s,Ba%s,Bo%s,Bh%s”

65. VC - Vertical Control point

(When solving local transformation, each control point's lat, long and height will be recorded.)

Record type: VC

Field headers:

PN: Control point number

LA: Latitude of control point

LN: Longitude of control point

HT: Ellipsoid height of control point

--: Description

“VC,PN%s,LA%s,LN%s,HT%s,--%s”

General and Conventional Field List

Field	Type	Description
--: Note	string	Character string
AD: Azimuth Direction	enum	(See Enumerated Fields List Below)
AL: Angle Left	double	Angle (See MO for units)
AR: Angle Right	double	Angle (See MO for units)
AS: Ahead on station	double	Linear Distance (See MO for units)
AU: Angle Unit	enum	(See Enumerated Fields List Below)
AZ: Azimuth	double	Geodetic Angle (See MO for units)
BC: Back Circle	double	Angle (See MO for units)
BD: Backsight direct	string	2 char string "BD"
BP: Back point	string	Character string
BS: Backsight	double	Linear Distance (See MO for units)
BV: Backsight reverse	string	2 char string "BV"
CE: Change elevation	double	Linear Height (See MO for units)
CF: Slope used	boolean	(See Enumerated Fields List Below)
CR: Circular Reading	double	Angle (See MO for units)
DE: Declination	double	Geodetic Angle (See MO for units)
DS: Design Slope	double	Linear Distance (See MO for units)
DT: Date (JB Record)	string	Character string
DT: Date (SU Record)	int (8)	MMDDYYYY
E: Adj. Easting	double	Linear Distance (See MO for units)
EC: Earth Curvature	enum	(See Enumerated Fields List Below)
ED: Delta easting	double	Linear Distance (See MO for units)
EG: Sun Position	string	(See Enumerated Fields List Below)
EL: Elevation or Adj. Elevation	double	Orthometric Height (See MO for units)
EO: EDM offset	double	EDM offset (See MO for units)
FD: Foresight direct	string	2 char string "FD"
FE: Foresight elevation	double	Orthometric Height (See MO for units)
FN: Feature code name	string	Character string
FP: Foresight point	string	Character string
FV: Foresight reverse	string	2 char string "FV"
GD: Grade	double	Unitless Slope
GH: Greenwich hour angle	double	Geodetic Angle (See MO for units)
HC: Horizontal dist. to center line	double	Linear Distance (See MO for units)
HD: Horizontal distance	double	Linear Distance (See MO for units)
HD: Horizontal or relative horizontal dist.	double	Linear Distance (See MO for units)
HH: Horizontal distance to hinge point	double	Linear Distance (See MO for units)
HI: Height of Instrument	double	Linear Height (See MO for units)
HR: Height of Rod	double	Linear Height (See MO for units)
LA: Latitude	double	GeodeticAngle (DMS)
LD: Delta elevation	double	Linear Distance (See MO for units)
LO: Longitude	double	GeodeticAngle (DMS)
LR: Left/Right Offset	double	Linear Distance (See MO for units)
N: Adj. Northing	double	Linear Distance (See MO for units)
ND: Delta northing	double	Linear Distance (See MO for units)

NM: Job Name	string	Character string
OB: Observed slope	double	Linear Distance (See MO for units)
OD: Offset Direction	int	(See Enumerated Fields List Below)
OE: Offset Delta	double	Linear Distance (See MO for units)
OL: Offset length	double	Linear Distance (See MO for units)
OP: Occupy point	string	Character string
PN: Point name	string	Character string
SD: Slope Distance	double	Linear Distance (See MO for units)
SF: Scale Factor	double	Unitless Number
SM: Semi-diameter of Sun (in DMS)	double	Angle in Degrees Minutes Seconds
ST: Station	double	Linear Distance (See MO for units)
TM: Time (JB – Record)	string	HH:MM:SS
TM: Time (EP – Record)	int(6)	HHMMSS
TM: Time (SU – Record)	double	HH.dddddd in UTC Time
TN: Attribute name	double	Linear Distance (See MO for units)
TV: Attribute value in string form	double	Linear Distance (See MO for units)
UN: Distance Unit	enum	(See Enumerated Fields List Below)
VC: Vertical distance to center point	double	Linear Distance (See MO for units)
VD: Vertical or relative vertical distance	double	Angle (See MO for units)
VH: Vertical distance to hinge point	double	Angle (See MO for units)
ZD: Zenith Direct	double	Angle (See MO for units)
ZE: Zenith or Zenith angle	double	Angle (See MO for units)
ZV: Zenith Reverse	double	Angle (See MO for units)

General and Conventional Enumerated Fields List

Field	Type	0	1	2
AD: Azimuth direction	enum	North	South	
AU: Angle Unit	enum	degree	grads	
CF: Slope used	bool	cut	fill	
EC: Earth Curvature	enum	off	on	
OD: Offset direction	int	Center	Right	Left
UN: Distance unit	enum	Feet	Meter	US Survey Feet
EG: Sun Position*	string	Left Trailing edge	Right Trailing Edge	center

*Note: Enumerated as 1 char string "0", "1", "2"

GPS Field List

Field	Type	Description
-- : Description (Feature Code)	string	Character string
AE: Location Indicator	enum	(See Enumerated Fields List Below)
AF: Azimuth format	enum	(See Enumerated Fields List Below)
AI: Antenna Index	int	(See Antenna.ini File)
AN: Antenna Number	int	(See Antenna.ini File)
AO: Azimuth Orientation	WORD	(See Enumerated Fields List Below)
AT: Antenna Type (name of antenna)	string	Character string
AZ: Azimuth	double	Geodetic Angle(See MO for units)
CL: Classification	enum	(See Enumerated Fields List Below)
CO: Coordinate System Option	WORD	(See Enumerated Fields List Below)
CT: Origin center	enum	(See Enumerated Fields List Below)
DA: Datum Transformation Type	WORD	(See Enumerated Fields List Below)
DC: Derivation Code	enum	(See Enumerated Fields List Below)
DH: HDOP from Rx	double	Horizontal Dilution of Precision (Unitless)
DM: Dimensions Used	WORD	(See Enumerated Fields List Below)
DN: Datum name	string	Character string
DV: VDOP from Rx	double	Vertical Dilution of Precision (Unitless)
DX: Base line Delta X	double	Linear Distance (See MO for units)
DY: Base line Delta Y	double	Linear Distance (See MO for units)
DZ: Base line Delta Z	double	Linear Distance (See MO for units)
E: Easting	double	Linear Grid Distance (See MO for units)
EL: Elevation	double	Orthometric Height (See MO for units)
EM: Ellipse Name	string	Character string
FI: File name	string	Character string
FO: File name one	string	Character string
FT: File name two	string	Character string
GF: Geodetic Flags	bit flags	(See Enumerated Fields List Below)
GM: GPS Measure Method	enum	(See Enumerated Fields List Below)
GN: Geoid Model Name	string	Character string
GO: Grid Orientation	WORD	(See Enumerated Fields List Below)
HI: Height of laser at GPS ref. Point	double	Linear Height (See MO for units)
HO: Horizontal Offset	double	Linear Distance (See MO for units)
HP: Horizontal Precision	double	Linear Distance (See MO for units)
HR: Height of laser target at store offset Pt.	double	Linear Height (See MO for units)
HT: Height or Ellipsoid Ht.	double	Linear Height (See MO for units)
IF: Ellipse inverse flattening	double	Ellipsoid Parameter (Unitless)
LA: Latitude	double	Geodetic Angle (DMS)
LN: Longitude	double	Geodetic Angle (DMS)
LX: Translation x	double	Linear Distance (See MO for units)
LY: Translation y	double	Linear Distance (See MO for units)
LZ: Translation z	double	Linear Distance (See MO for units)
MA: Measured antenna height	double	Linear Height (See MO for units)
ME: Measure Method	enum	(See Enumerated Fields List Below)
N: Northing	double	Linear Grid Distance (See MO for units)

OO: Orientation one	double	Latitude (DMS) or Angle (See MO for units)**
OT: Orientation two	double	Latitude (DMS)
OX: Rotation x	double	Angle (See MO for units)
OY: Rotation y	double	Angle (See MO for units)
OZ: Rotation z	double	Angle (See MO for units)
PN: Point Name	string	Character string
PT: GPS Point Type	enum	(See Enumerated Fields List Below)
PV: Type of Vertical Adjustment	WORD	(See Enumerated Fields List Below)
RA: Reduced antenna height	double	Linear Height (See MO for units)
RD: Ellipsoid Radius	double	Ellipsoid Semi-Major Axis (See MO for units)
RE: Recording interval (secs.)	int	GPS Data Logging Rate (seconds)
RH: Horizontal RMS from Rx	double	Linear Distance (See MO for units)
RS: Rx Serial Number	string	Character string
RT: Rotation about origin	double	Angle (See MO for units)
RV: Vertical RMS from Rx	double	Linear Height (See MO for units)
RX: Rx Type	string	Character string
RY: Rectify	boolean	False - No / True - Yes
SA: Slope east	string	Scale in parts per million (Unitless)
SC: Error Scale or Scale Factor	double	Scale (Unitless)
SD: Slope Distance	double	Linear Distance (See MO for units)
SF: Scale factor at origin	double	Scale (Unitless)
SG: Setup Group	int	Unique integer identifier
SO: Slope north	string	Scale in parts per million (Unitless)
SP: Scale factor in ppm	double	Scale in parts per million (Unitless)
SV: Min. # of SV during obs.	int	Integer Number of Satellites (Unitless)
TA: Tape Adjustment	double	Linear Distance (See MO for units)
TE: Translation East	double	Linear Distance (See MO for units)
TH: Translation North	double	Linear Distance (See MO for units)
TM: System Time	string	HH:MM:SS
TP: Type of projection	WORD	(See Enumerated Fields List Below)
TS: Antenna Serial Number	string	Character string
VO: Vertical Offset	double	Linear Height (See MO for units)
VP: Vertical Precision	double	Linear Height (See MO for units)
XX: Variance X	double	for GPS position (m ²)
XY: Covariance X,Y	double	for GPS position (m ²)
XZ: Covariance X,Z	double	for GPS position (m ²)
YY: Variance Y	double	for GPS position (m ²)
YZ: Covariance Y,Z	double	for GPS position (m ²)
ZE: Zenith Angle	double	Angle (See MO for units)
ZG: Zone Group (system) name	string	Character string
ZN: Zone name	string	Character string
ZZ: Variance Z	double	for GPS position (m ²)

**Depends on Projection Type Used

GPS Enumerated Fields List

AE: Location indicator for Denmark projections enum

- 1 = None
- 2 = Zeeland
- 3 = Jutland
- 4 = Bornholm

AF: Azimuth Format enum

- 0 = Geodetic
- 1 = Grid

AO: Azimuth Orientation WORD

- 1 = North
- 2 = South

CL: Classification enum

- 0 = UnknownClass
- 1 = Normal
- 2 = Control
- 3 = AsBuilt
- 4 = Check
- 5 = BackSight
- 6 = Deleted Normal
- 7 = Deleted Control
- 8 = Deleted AsBuilt
- 9 = DeletedCheck
- 10 = DeletedBackSight

CO: Coordinate System Option WORD

- 1 = None
- 2 = Scale only
- 3 = Keyed in
- 4 = Chosen from library

CT: Origin Center enum

- 0 = Equator
- 1 = Projection center

DA: Datum Transformation Type WORD

- 513 = csdMolodenskyDatum
- 514 = csdMultipleRegressionDatum
- 515 = csdSevenParameterDatum
- 516 = csdGridDatum
- 517 = csdWGS84Datum

DC: Derivation Code enum

- 1 = ModeBase (Base)
- 2 = ModeRover (Rover)
- 3 = ModeGetBase (GetBase)
- 4 = ModeStatic (Static)

DM: Number of Dimensions Used for a Calibration WORD

- 1 = 0D (None)
- 2 = 1D (Vertical only)
- 3 = 2D (Horizontal only)
- 4 = 3D (Both vertical and horizontal)
- 5 = Any

GF: Geodetic Flags Bit Flags

- Bit 0 = GPS Base Point
- Bit 1 = GPS Horizontal Control Point
- Bit 2 = GPS Vertical Control Point
- Bit 3 = GPS Control Point
- Bit 4 = Local Map Plane Origin (Legacy, not used in Survey Pro 3.5 and beyond)
- Bit 5 = GPS Base Coordinate Invalid

GM: GPS Measure Method enum

- 0 = UnknownMethod
- 1 = UserInput
- 2 = Autonomous
- 3 = RTKFloat
- 4 = RTKFixed
- 5 = CopiedPoint
- 6 = RTCMCode
- 7 = WASS

GO: Grid Orientation WORD

- 1 = NE
- 2 = SW
- 3 = NW
- 4 = SE

ME: MeasureMethod enum

- 0 = Unknown
- 1 = True
- 2 = Uncorrected

PT: GPS Point Type enum

- 1 = Control
- 2 = Check
- 3 = DataCollect
- 4 = Offset
- 5 = RemoteElevation
- 6 = PostProcess
- 7 = UserInput

PV: Type of Vertical Adj. WORD

- 1 = inclined plane
- 2 = geoid model
- 3 = combined

TP: Type of Projection**WORD**

- 2049 = Albers Equal Area Conic
- 2050 = Cassini
- 2051 = Krovak
- 2052 = Lambert Conformal Conic One Parallel
- 2053 = Mercator
- 2054 = New Zealand Map Grid
- 2055 = Oblique Conformal Conic
- 2056 = Oblique Mercator Azimuth
- 2057 = Oblique Stereographic
- 2058 = Plane
- 2059 = Stereographic
- 2060 = RD Stereographic
- 2062 = Transverse Mercator
- 2063 = United Kingdom National Grid
- 2064 = Denmark
- 2065 = Hungarian EOVS
- 2066 = Lambert Conformal Conic Two Parallel
- 2067 = Oblique Mercator Two Points
- 2068 = Double Stereographic
- 2069 = Grid

Legacy Field List

Field	Type	Desc.
-- : Description (Feature Code)	string	Character string
AR: Angle right	double	Angle (See MO for units)
Ba: Base Latitude	double	Base Station Latitude (DMS)
BC: Back circle	double	Angle (See MO for units)
Bh: Base Ellipsoid Height	double	Base Station Height (See MO for units)
Bo: Base Longitude	double	Base Station Longitude(DMS)
CS: Coordinate System	int	Index into TDS Geodetic dll
DA: Datum	int	Index into TDS Geodetic dll
EL: Elevation	double	Orthometric Height (See MO for units)
FI: Custome File Name	string	Character string
GI: Geoid model index	int	Index into TDS Geodetic dll
GU: Geoid Undulation at base	double	Undulation Value (See MO for Units)
Ha: Coefficient a	double	Unitless coefficient
Hb: Coefficient b	double	Unitless coefficient
Hc: Coefficient c	double	Distance Coefficient (See MO for units)
Hd: Coefficient d	double	Distance Coefficient (See MO for units)
HE: Hemisphere	int	Index into TDS Geodetic dll
HT: Height	double	Linear Height (See MO for units)
LA: Latitude	double	Geodetic Angle (DMS)
LN: Longitude	double	Geodetic Angle (DMS)
ME: Method	int	Index into TDS Geodetic dll
PN: Backsight point	string	Character string
RT: Rotation	double	Angle (See MO for units)
SC: Scale	double	Unitless Number
SD: Slope Distance	double	Linear Distance (See MO for units)
Va: Coefficient a	double	Unitless coefficient
Vb: Coefficient b	double	Unitless coefficient
Vc: Coefficient c	double	Distance Coefficient (See MO for units)
ZE: Zenith	double	Angle (See MO for units)
ZO: Zone	int	Index into TDS Geodetic dll