ProMark2 TRAINING

MODULE SEVEN

DATA POST-PROCESSING

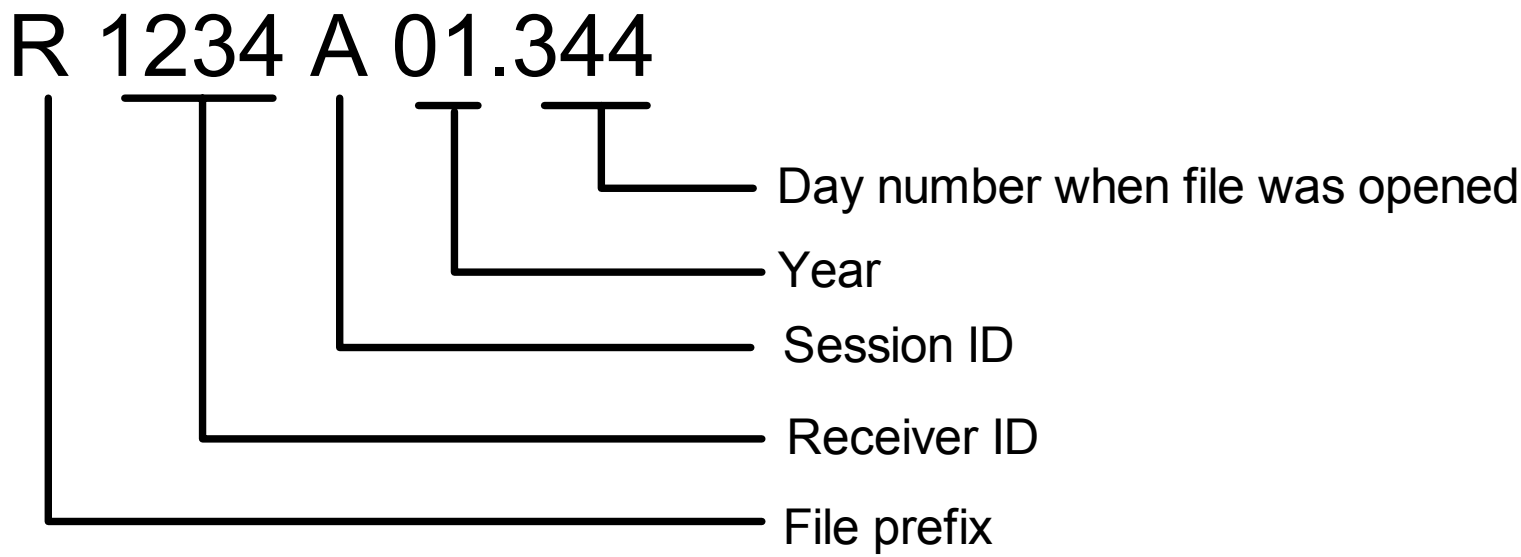
AIM OF MODULE 7

- **IDENTIFY THE FUNCTIONAL PURPOSE OF THE FILE MANAGER SCREEN AND, BRIEFLY DETAIL THE FILE MANAGER ATTRIBUTES**
- **STATE THE FUNCTIONAL PURPOSE OF THE ASHTECH SOLUTIONS SOFTWARE**
- **IDENTIFY THE PROCEDURES FOR CONNECTING THE ProMark2 TO THE COMPUTER**
- **LIST THE STEPS FOR CREATING A PROJECT SET-UP TO EFFECT DOWNLOADING OF DATA FILES INTO THE ASHTECH SOLUTIONS SOFTWARE**
- **LIST IN SEQUENCE THE STEPS AND DIRECTIVES TO INITIATE GPS DATA PROCESSING**

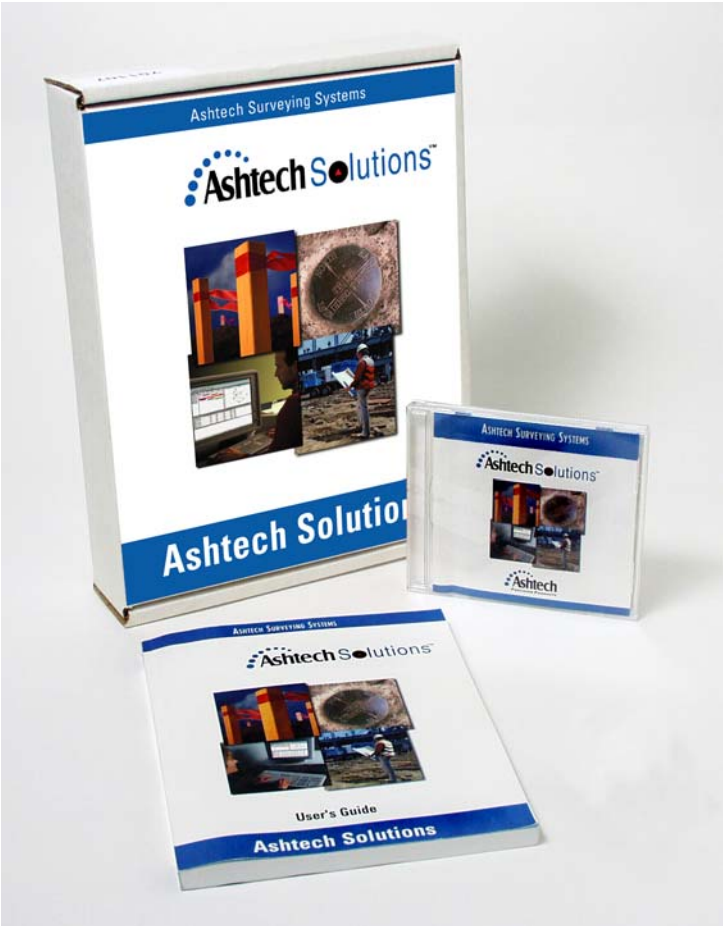
FILE MANAGER SCREEN

- THE FILE MANAGER SCREEN IS ACCESSED BY SELECTING: FILE MANAGER
- PERMITS EXAMINATION OF INDIVIDUAL FILES STORED IN MEMORY
- IDENTIFIES FILES NO LONGER NEEDED
- DISPLAYS THE TAG OF THE FILES THAT HAVE BEEN DOWNLOADED FOR PROCESSING
- IDENTIFIES THE AMOUNT OF MEMORY OCCUPIED BY STORED DATA FILES
- IDENTIFIES THE AMOUNT OF "FREE" MEMORY AVAILABLE FOR DATA STORAGE
- DELETE: DELETES THE HIGHLIGHTED FILE
- DELETE ALL: DELETES ALL FILES

NAMING CONVENTIONS FOR SURVEY DATA FILES

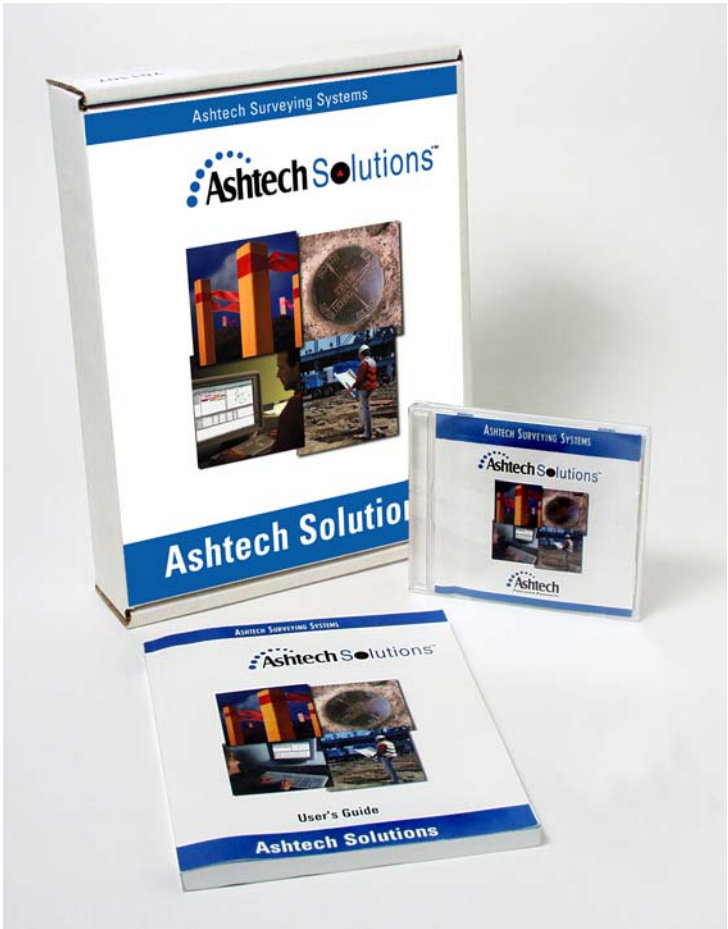


ASHTECH SOLUTIONS



- USES THE WINDOWS OPERATING SYSTEM
- PROVIDES GUIDES FOR PLANNING, PROCESSING, CONTROL, REPORTING, AND DATA EXPORTING
- FACILITATES DATA PROCESSING STEPS THAT ARE EASY TO USE AND UNDERSTAND
- PROVIDES THE TOOLS REQUIRED TO PROCESS AND DOWNLOAD GPS SATELLITE DATA FROM EACH ProMark2 RECEIVER
- SURVEY DATA IS PRESENTED IN GRAPHICAL AND TABULAR FORMS
- INCLUDES ADVANCED BLUNDER DETECTION AND ANALYSIS TOOLS THAT ENSURE ACCURATE AND RELEIABLE SOLUTIONS
- SUPPORTS PROCESSING OF RINEX DATA FORMAT
- SUPPORTS PROCESSING OF DATA FROM ALL ASHTECH SURVEY SYSTEMS

ASHTECH SOLUTIONS



KEY PROGRAM MODULES

- MISSION PLANNING
- DATA TRANSFER
- VECTOR PROCESSING
- LEAST-SQUARES PROCESSING
- DATUM TRANSFORMATION AND MAP PROJECTION
- REPORT GENERATION
- FILE EXPORTATION

CREATING A PROJECT START-UP

- **LOCK THE ProMark2 INTO THE OFFICE RECEIVER BRACKET AND CONNECT THE DOWNLOAD CABLE TO THE DATA INPUT PORT ON THE COMPUTER**

- **TURN ON THE ProMark2**

- **LOAD THE ASHTECH SOLUTIONS COMPACT DISK INTO THE CD READ DRIVE**

- **UPON STARTING THE ASHTECH SOLUTIONS, THE WELCOME DIALOG BOX OPENS**

- **CLICK: CREATE NEW PROJECT**
- **THIS CLOSES THE WELCOME DIALOG BOX AND OPENS THE CREATE NEW PROJECT DIALOG BOXES TO THE GENERAL TAB**

- **ENTER: THE PROJECT NAME, WHERE THE PROJECT FILES WILL BE STORED, ANY COMMENTS TO DESCRIBE THE PROJECT, THE SURVEY COMPANY NAME, AND THE CLIENT NAME**

CREATING A PROJECT START-UP (Cont'd)

- **CLICK: COORDINATE TAB TO SWITCH TO THE COORDINATE SYSTEM TAB**

- **SELECT: SYSTEM TYPE TO WORK IN: LOCAL GRID, GRID, OR GEODETIC DATUM**

- **DEPENDING ON THE SYSTEM TYPE SELECTED, EITHER THE GROUND SYSTEM, LOCAL GRID SYSTEM, GRID SYSTEM & ZONE, OR GEODETIC DATUM DROP DOWN LIST BOXES ACTIVATE. SELECT THE CORRESPONDING SYSTEMS TO WORK IN FOR THE PROJECT**

- **SELECT: THE BUTTON CORRESPONDING TO WHETHER ALL HEIGHTS ARE TO BE ENTERED AND DISPLAYED IN ELLIPSOIDAL ELEVATIONS OR ORTHOMETRIC ELEVATIONS**

- **IF ORTHOMETRIC ELEVATIONS IS SELECTED, SELECT: GEOID MODEL ASSOCIATED WITH THE SELECTED DATUM**

- **CLICK: THE MISCELLANEOUS TAB TO SWITCH TO THE MISCELLANEOUS TAB**

CREATING A PROJECT START-UP (Cont'd)

- **NOTE: ASHTECH SOLUTIONS SUGGESTS COMMONLY USED LEVELS FOR ACCURACY AND BLUNDERS. TO CHANGE THE ACCURACY OR BLUNDER LEVELS, ENTER A NEW LEVEL**

- **SELECT: CONFIDENCE LEVEL FOR REPORTING PROCESSING AND ADJUSTMENT STATISTICS AT EITHER 95% OR STANDARD ERROR (68%)**

- **SELECT: LINEAR UNITS USED FOR INPUT, OUTPUT, AND DISPLAY OF LINEAR INFORMATION IN THE PROJECT (U.S. FEET, INTERNATIONAL FEET, OR METERS)**

- **SELCT: TIME SYSTEM USED FOR INPUT, OUTPUT, AND DISPLAY OF TIME BASED INFORMATION IN THE PROJECT. IF YOU SELECT LOCAL, ENTER THE TIME DIFFERENCE BETWEEN THE LOCAL TIME ZONE AND THE UTC**

- **CLICK: OK TO CREATE THE PROJECT**

- **NOTE: THE ADD FILES DIALOG BOX OPENS. CLICK THE BUTTON CORRESPONDING TO THE SOURCE OF THE DATA FILES**

DOWNLOADING DATA

- **SELECT: FROM RECEIVER FROM THE ADD GPS RAW DATA MENU OF THE PROJECT MENU TO OPEN THE ASHTECH DOWNLOAD WINDOW**
- **SELECT: RECEIVER AND SELECT CONNECT VIA CABLE**
- **VERIFY THE 'COM PORT' AND THE BAUD RATE ARE CORRECT, AND CLICK OK TO CONNECT TO RECEIVER**
- **VERIFY THAT THE PROJECT DIRECTORY IS ACTIVE IN THE PC PANE [RIGHT HAND SIDE] OF THE ASHTECH DOWNLOAD MAIN WINDOW**
- **SELECT THE DATA FILES FOR DOWNLOADING INTO THE PROJECT, AND DRAG THEM TO THE PC PANE**
- **IF THERE ARE OTHER ProMark2's TO DOWNLOAD, SELECT: SWITCH DATA SOURCE FROM THE FILE MENU AND REPEAT THE PREVIOUS STEP**
- **CLICK THE CLOSE BOX TO ADD THE GPS RAW DATA TO THE PROJECT AND CLOSE ASHTECH DOWNLOAD**

EDITING ANTENNA HEIGHT

- **NOTE: VERIFY THE OBSERVATIONS TAB IS ACTIVE IN THE WORKBOOK WINDOW**
- **SELECT: VALUE LISTED IN THE ANTENNA HEIGHT FILED FOR THE SITE YOU WISH TO CHANGE**
- **ENTER: NEW ANTENNA HEIGHT VALUE IN THE LINEAR UNITS SPECIFIED IN THE PROJECT SET-UP**
- **SELECT: SLANT OR VERTICAL IN THE HEIGHT TYPE FIELD FOR THE HEIGHT THAT WAS CHANGED TO SPECIFY THE HEIGHT TYPE**
- **SELECT: ANTENNA MODEL USED TO COLLECT THE DATA IN THE ANTENNA TYPE COLUMN**
- **VERIFY ANTENNA MODEL PARAMETERS, SUCH AS RADIUS, L1 VERTICAL OFFSET, AND L2 VERTICAL OFFSET IN THE ANTENNA PARAMETERS DIALOG BOX**

EDITING SITE ID's

- **NOTE: VERIFY THE OBSERVATIONS TAB OR SITES TAB IS ACTIVE IN THE WORKBOOK WINDOW**
- **SELECT: VALUE LISTED IN THE SITE ID FILE FOR THE SITE THAT WILL CHANGE**
- **ENTER: THE NEW 4-CHARACTER IDENTIFIER**

SET A CONTROL SITE

- SETTING A CONTROL SITE IN THE SITE PROPERTIES DIALOG BOX
- **FROM THE MAP VIEW WINDOW, DOUBLE-CLICK ON A SITE TO OPEN THE SITE PROPERTIES DIALOG BOX**
- **SWITCH TO THE CONTROL TAB**
- **CHECK THE CONTROL TYPE AND FIX STATUS BOXES CORRESPONDING TO THE TYPE OF CONTROL AND POSITION FIXING FOR THE SITE**
- **CLICK: OK TO SAVE ANY CHANGES AND CLOSE THE SITES PROPERTIES DIALOG BOX**
- SETTING A CONTROL SITE IN THE CONTROL SITE TAB OF THE WORKBOOK WINDOW
- **NOTE: VERIFY THE THE CONTROL SITES TAB IS ACTIVE IN THE WORKBOOK WINDOW**
- **SEE NEXT SLIDE**

SET A CONTROL SITE (Cont'd)

- **CLICK THE ARROW IN THE SITE ID FIELD, AND SELECT A SITE AS BOTH A HORIZONTAL AND VERTICAL POINT. IF THE POINT IS TO BE A VERTICAL OR HORIZONTAL CONTROL POINT, BUT NOT BOTH, CLICK THE ARROW IN THE TYPE FIELD AND SELECT THE TYPE OF CONTROL FOR THE POINT**

- **NOTE: IF THE POINT IS TO BE HELD FIXED IN EITHER THE VERTICAL OR HORIZONTAL DIRECTION, BUT NOT BOTH, CLICK THE ARROW IN THE FIXED FIELD AND, SELECT THE TYPE OF FIX FOR THE POINT**

PROCESSING DATA

- **NOTE: TO PROCESS DATA, SELECT: "PROCESS ALL" FROM THE PROCESSING IN THE RUN MENU**

- **USE THE "PROCESS NEW" ICON BUTTON TO PROCESS ANY OBSERVATIONS IN THE PROJECT THAT ARE CURRENTLY UNPROCESSED.**

- **USE THE PROCESS NEW BUTTON TO:**
  --PROCESS ALL OBSERVATIONS IN THE PROJECT FOR THE FIRST TIME
  --PROCESS ANY OBSERVATIONS ADDED TO THE PROJECT.

- **USING THE PROCESS NEW BUTTON IN THIS CASE RESULTS IN NOT RE-PROCESSING OBSERVATIONS ALREADY PROCESSED IN THE PROJECT**

- **NOTE: WHEN EDITING AN OBSERVATION PARAMETER, ANY VECTOR PRODUCED BY THAT OBSERVATION IS REMOVED FROM THE PROJECT. TO PRODUCE A NEW VECTOR, THIS DATA MUST BE RE-PROCESSED**

PERFORMING A LOOP CLOSURE

- **NOTE: TESTING LOOP CLOSURES IS A GOOD METHOD OF ISOLATING PROBLEM VECTORS IN A PROJECT. IT ALSO PROVIDES A GOOD IDEA OF THE PRECISION OF THE DATA COLLECTED**

- **VERIFY THAT THE LOOP CLOSURE MODE IS ACTIVE IN THE MAP VIEW WINDOW**

- **SELECT A SUCCESSION OF VECTORS FOR THE LOOP. VECTORS MUST BE CONNECTED. THE LAST VECTOR ADDED TO THE LOOP CAN BE DESELECTED BY CLICKING ON IT A SECOND TIME**

- **AS SOON AS THE LOOP CLOSES, CLOSURE CALCULATION COMPLETES AND THE LOOP CALCULATORS DISPLAY IN THE LOOP CLOSURE TAB**

INCLUDE/EXCLUDE A VECTOR

- **NOTE: PROCESSED VECTORS CAN BE INDIVIDUALLY EXCLUDED AND RE-INCLUDED INTO THE PROJECT. EXCLUDING A VECTOR ELIMINATES IT FROM USAGE IN THE ADJUSTMENT, REPORTS, AND EXPORT**

- **FROM THE MAP VIEW WINDOW, DOUBLE-CLICK ON A VECTOR TO OPEN THE VECTOR PROPERTIES DIALOG BOX**

- **IF THE VECTOR IS REPEATED, USE THE ARROW TO THE RIGHT OF THE DAY AND SESSION FIELD TO SELECT THE VECTOR BY SESSION YOU WISH TO EXCLUDE FROM THE NETWORK ADJUSTMENT**

- **CLICK: OK TO ACCEPT ANY CHANGES, AND CLOSE THE VECTOR PROPERTIES DIALOG BOX**

- **NOTE: A VECTOR CAN BE EXCLUDED IN THE VECTORS TAB OF THE WORKBOOK WINDOW. SELECT THE VECTOR AND SELECT EXCLUDE FROM THE RIGHT CLICK MENU**

ADJUSTING DATA

- **NOTE: FOR A WELL DESIGNED NETWORK WITH SUFFICIENT REDUNDANCY, PERFORMING A LEAST-SQUARES ADJUSTMENT OF THE PROCESSED VECTORS WILL HELP IDENTIFY BLUNDERS, IMPROVE OVERALL PRECISION, AND SUPPLY RELIABLE PRECISION ESTIMATES FOR NEWLY POSITIONED POINTS**

- **TO ADJUST NETWORK: CLICK THE ADJUST ICON**

- **NOTE: ALL DATA AND SITES IN THE PROJECT SIMULTANEOUSLY ADJUST, AND THE RESULTS ARE AVAILABLE IN THE ADJUSTMENT ANALYSIS AND ADJUSTMENT PRECISION TABS**

REPORT GENERATION

- **NOTE: REPORTS CAN BE GENERATED WITH VARIOUS TYPES OF PROJECT DATA. GENERATED REPORTS ARE DISPLAYED IN WORDPAD OR OTHER WORD PROCESSORS, WHICH CAN BE SAVED OR PRINTED**

- **SELECT: REPORT FROM THE PROJECT MENU TO OPEN THE THE PROJECT MENU DIALOG BOX**

- **SELECT THE ITEMS IN THE AVAILABLE ITEMS LIST BOX YOU WISH TO INCLUDE IN THE REPORT AND CLICK: ADD**

- **CLICK: OK TO CLOSE THE PROJECT REPORT DIALOG BOX AND GENERATE THE REPORT IN WORDPAD**

EXPORTING DATA

- **NOTE: DATA CAN BE EXPORTED TO A USER DEFINED TEMPLATE, BLUEBOOK DATA (ASHTECH B-FILE AND G-FILE), TDS COORDINATE FILE (*.cr5) OR AN ASHTECH O-FILE. THE TEMPLATE SPECIFIES WHICH DATA TO EXPORT AND FIELD DELIMITERS**

- **SELECT: EXPORT FROM THE PROJECT MENU TO OPEN THE EXPORT DIALOG BOX**

- **NAVIGATE TO THE LOCATION WHERE YOU WISH TO STORE THE EXPORTED DATA FILE**

- **ENTER THE FILE NAME FOR THE EXPORTED DATA FILE IN THE FILE NAME FIELD**

- **SELECT THE EXPORT FILE TYPE IN THE SAVE AS TYPE FIELD**

- **CLICK: SAVE TO EXPORT THE DATA**

ProMark2 FAQ's

Q: Can I process ProMark2 data with a copy of Ashtech Solutions I already have?

A: No! Ashtech Solutions Version 2.5 or higher is required for ProMark2 data processing.

Q: Do I receive a full version of Ashtech Solutions with a ProMark2 System?

A: Ashtech Solutions software shipped with the ProMark2 is identical to the full version of Solutions except it will only process L1 data. Contact Ashtech Sales for information on upgrades to the full L1/L2 version.

Q: Can I process ProMark2 data with CORS data?

A: CORS data can be converted to Ashtech data with the RINEX Converter supplied with Solutions software. The version of Solutions shipped with the ProMark2 will only process L1

ProMark2 FAQ's (Cont'd)

Q: Can I process ProMark2 data with data from other Ashtech receivers?

A: Yes! But only the L1 data will be processed with the ProMark2

Q: Can I process ProMarkX data with the ProMark2 data using Solutions?

A: Only ProMarkX 'static' data can be processed in Solutions. A 1 or 2 second Record Interval is necessary [We recommend using a 2 second interval]. The ProMarkX data must be converted to RINEX using RINEX Converter. Solutions 2.4 will accept RINEX data directly. Accuracy results may vary depending on the type of ProMark System used and environmental factors.