ProMark2 TRAINING

MODULE TWO

CONFIGURING FOR STOP & GO OPERATIONS

AIM OF MODULE 2

- **STATE BRIEFLY THE SIMILARITIES AND DIFFERENCES BETWEEN STOP & GO AND STATIC SURVEY MEHTODS**
- **IDENTIFY THE PROCEDURES FOR CONFIGURING THE ProMark2 FOR STOP & GO OPERATIONS**
- **STATE BRIEFLY THE INITIALIZATION SET-UP PROCEDURES FOR THE BASE REFERENCE AND ROVER RECEIVERS**
- **SHOW AND EXPLAIN BRIEFLY THE RECEIVER SCREENS USED FOR STOP & GO**

STOP & GO SURVEY FACTS

- SIMILARITIES
- **STOP & GO IS VERY SIMILAR TO STATIC SURVEYING WITH THE REQUIREMENT FOR USING AT LEAST TWO RECEIVERS TO SIMULTANEOUSLY RECORD AND STORE OBSERVATION DATA**

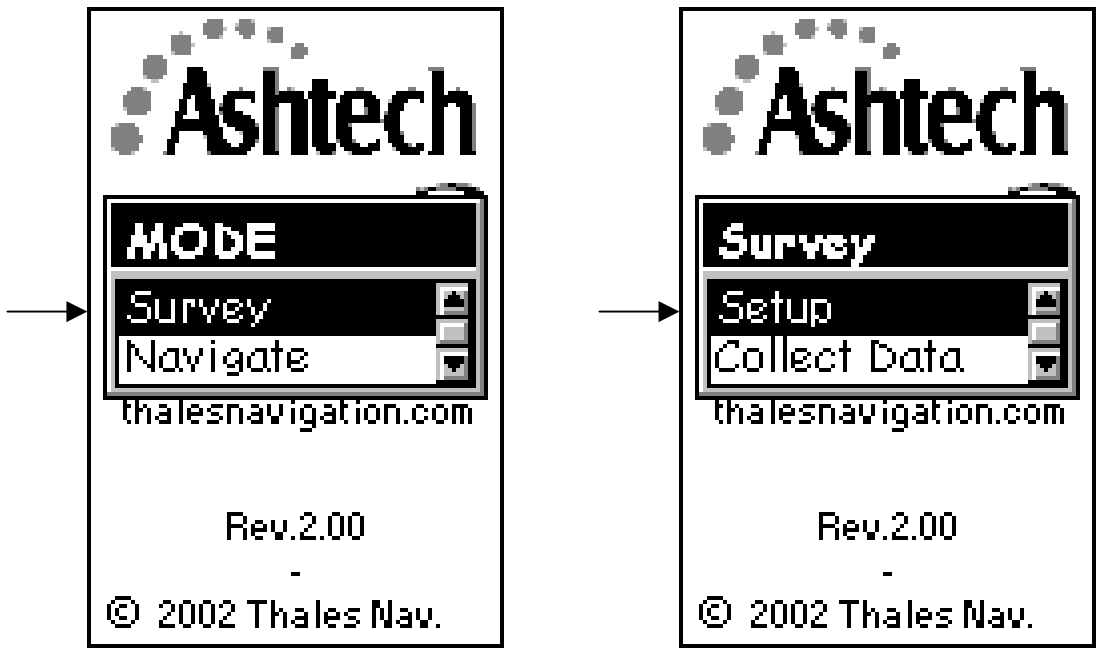
- DIFFERENCES
- **THE MOST SIGNIFICANT DIFFERENCE BETWEEN STATIC AND STOP & GO SURVEYING IS THE TIME WHERE THE ROVER RECEIVER MUST REMAIN STOPPED OVER A POINT OF UNKNOWN POSITION. THE KINEMATIC DATA AS THE ROVER GOES BETWEEN POINTS IS A PART OF THE SOLUTION**

- **STOP & GO SURVEYS MANDATE THE USE OF NO LESS THAN FIVE [5] SATELLITES FOR A SURVEY SESSION, WHEREAS STATIC SURVEYS REQUIRE A MINIMUM OF A LEAST FOUR [4] SATELLITES**

- **BASELINE OCCUPATION TIMES FOR STATIC SURVEYING ARE ON THE ORDER OF 30 MINUTES OR MORE FOR BASELINES OF 1-20km. FOR STOP & GO THE OCCUPATION TIME IS ON THE ORDER OF A FEW SECONDS OVER AN UNKNOWN POINT**

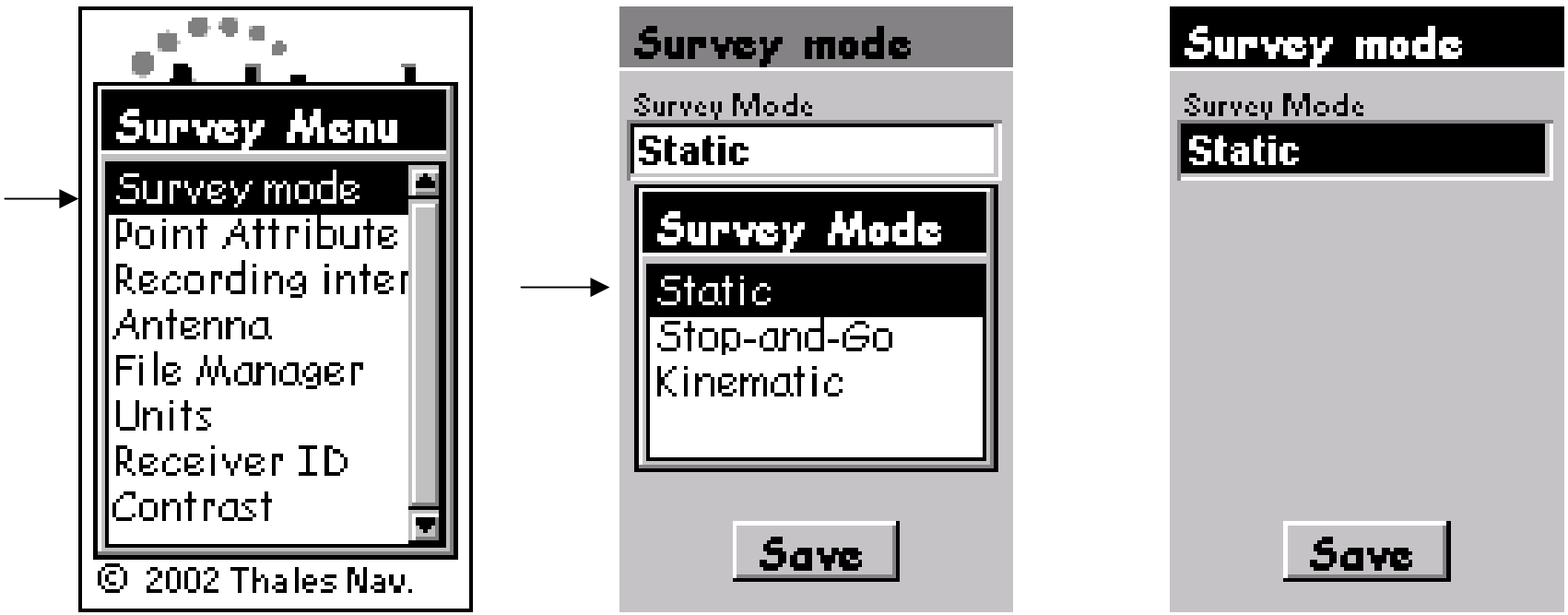
SURVEY MODE

- **PRESS THE RED BUTTON TO ENABLE POWER TO BOTH RECEIVERS**
- **ON THE MODE SCREEN SELECT: SURVEY**
- **HIT: ENTER**
- **ON THE SURVEY SCREEN SELECT: SET-UP**
- **HIT: ENTER**



SURVEY MODE—BASE--(Cont'd)

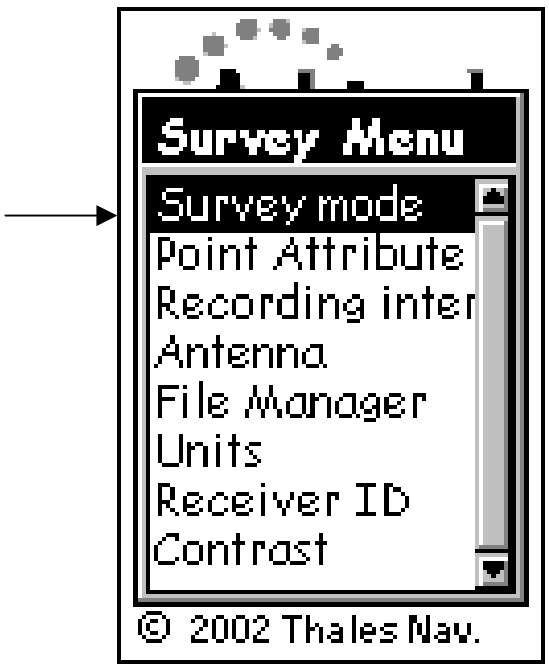
- SURVEY MENU SCREEN
- **SELECT: SURVEY MODE**
- **HIT: ENTER**
- **NOTE: DURING THE INITIAL USE OF THE ProMark2's, THIS ENTRY WILL DISPLAY THE SURVEY MODE WITH THE STATIC MODE DEFAULT.**
- **NOTE: THE BASE RECEIVER MUST BE SET-UP IN THE STATIC MODE!**
- **HIT: SAVE—TO STORE THIS MODE ONLY FOR THE BASE RECEIVER**

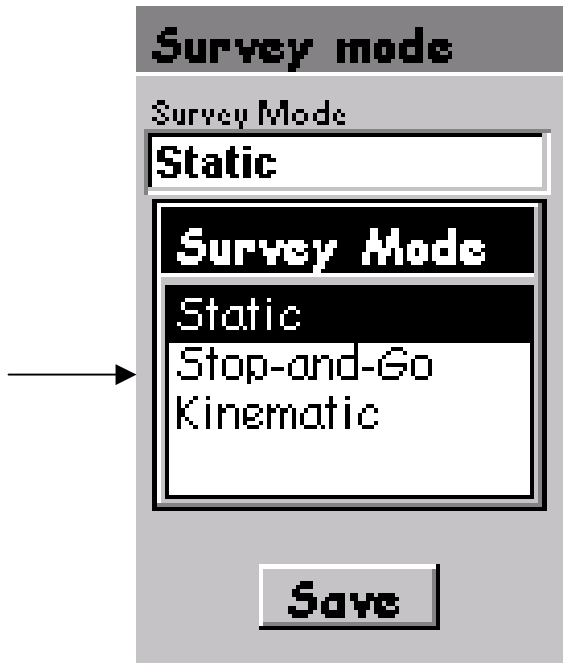


SURVEY MODE—ROVER-- (Cont'd)

- SURVEY MENU SCREEN (Cont'd)
- **NOTE: THE ROVER RECEIVER MUST BE SET IN THE STOP & GO MODE**

- **SELECT: SURVEY MODE**
- **HIT: ENTER**
- **ARROW KEY DOWN TO: STOP & GO**
- **HIT: ENTER**



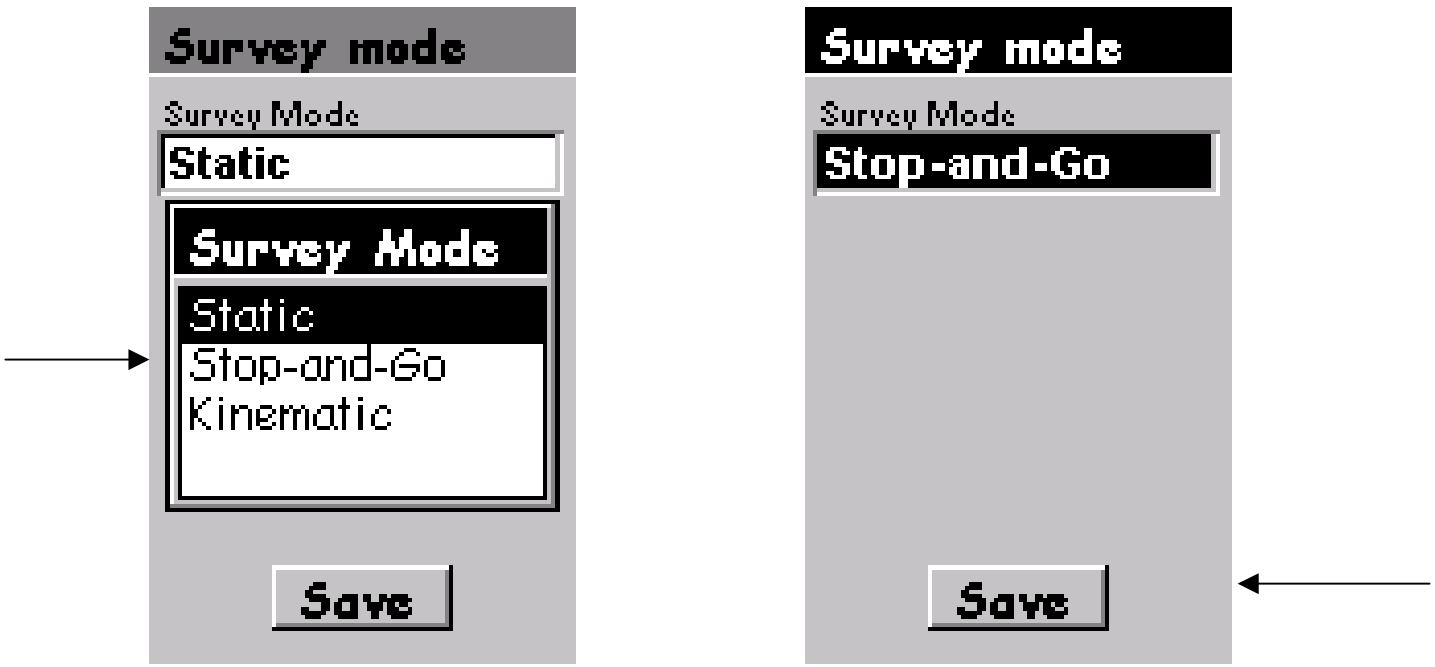


SURVEY MODE (Cont'd)

- SURVEY MENU SCREEN (Cont'd)
- **THE SURVEY MODE SCREEN WILL DISPLAY THE MODE: STOP & GO**

- **ARROW KEY DOWN TO HIGHLIGHT: SAVE**

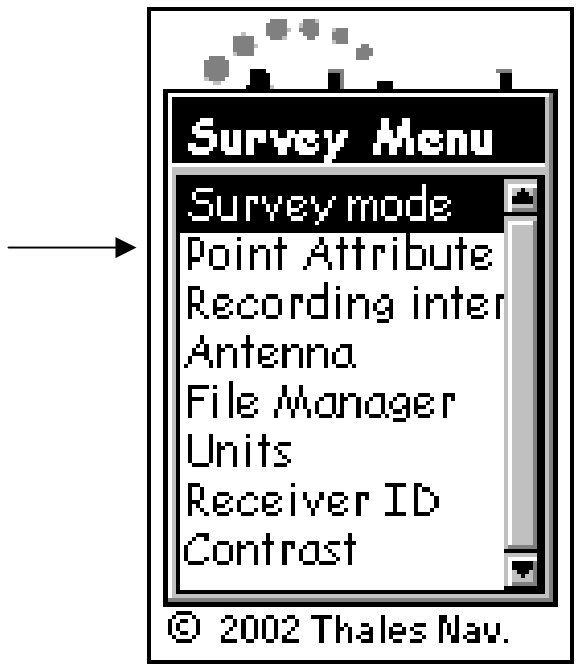
- **HIT: ENTER-- [THIS ACTION STORES THE STOP & GO MODE AS THE DEFAULT FOR THE ROVER RECEIVER]**



POINT ATTRIBUTE

- POINT ATTRIBUTE
- **AFTER THE STATIC (BASE) AND STOP & GO (ROVER) MODES HAVE BEEN SAVED, THE ProMark2's WILL AUTOMATICALLY REVERT BACK TO THE SURVEY MENU SCREEN. FOLLOW THE SET-UP PROCEDURES FOR BOTH RECEIVERS**

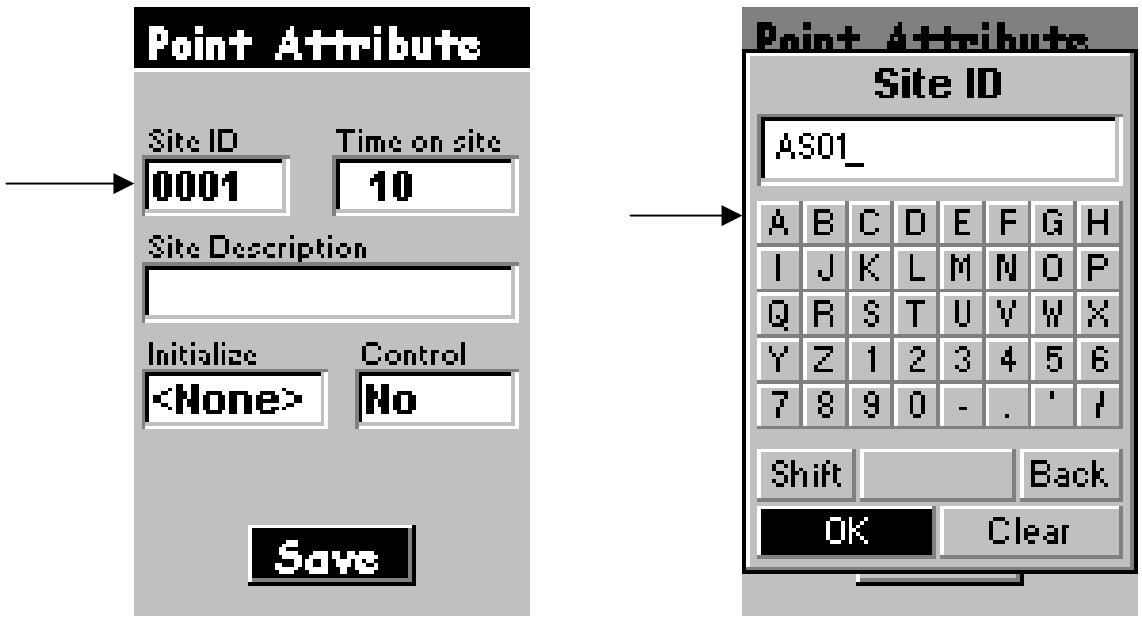
- **ARROW KEY DOWN AND HIGHLIGHT: POINT ATTRIBUTE**
- **HIT: ENTER**



POINT ATTRIBUTE (Cont'd)

- SITE ID
- **ARROW KEY DOWN ONCE TO HIGHLIGHT: SITE ID**
- **HIT: ENTER**
- **USE THE DIRECTIONAL ARROW KEY TO MOVE THE CURSOR (WHICH NORMALLY DEFAULTS ON THE LETTER 'A') DOWN AND OVER TO THE LOWER RIGHT FRAME MARKED CLEAR**

- **NOTE: THIS ACTION WILL CLEAR THE QUESTION MARKS OR ANY PREVIOUSLY ENTERED SITE ID'S**



POINT ATTRIBUTE

- SITE ID (Cont'd)
- **MOVE THE CURSOR VIA THE ARROW KEY TO HIGHLIGHT THE SELECTED ALPHANUMERIC CHARACTER**
- **HIT: ENTER**

- **NOTE: REPEAT THIS STEP UNTIL FOUR ALPHANUMERIC CHARACTERS ARE DISPLAYED IN THE SITE ID FRAME**

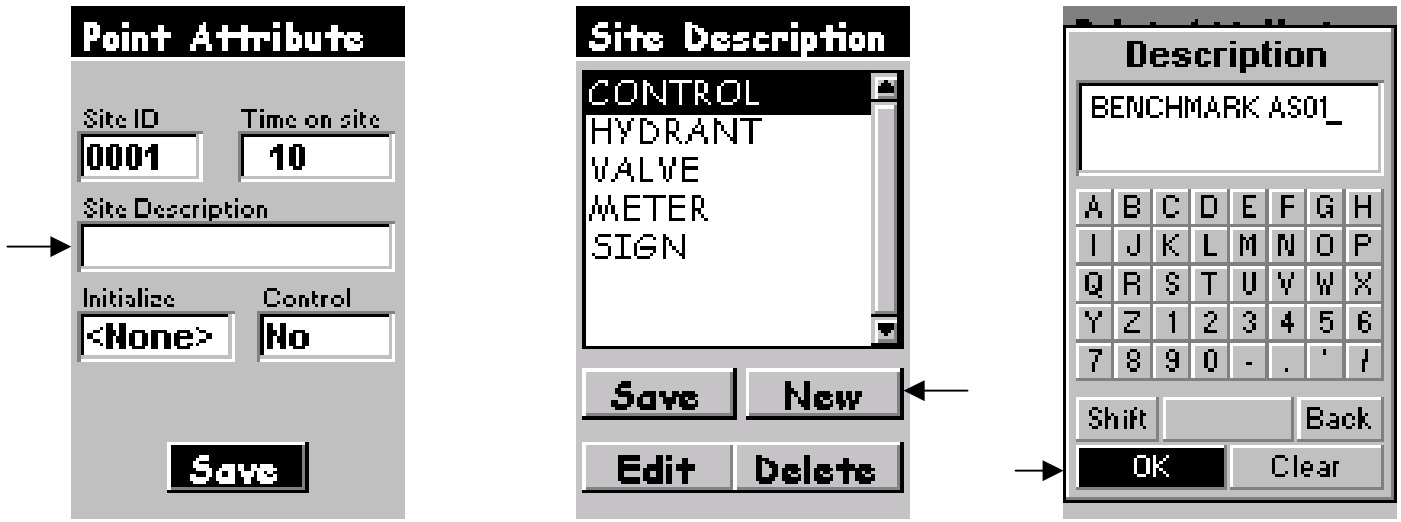
- **ARROW KEY DOWN AND HIGHLIGHT: OK**
- **HIT: ENTER**

- **NOTE: AFTER THE SITE ID HAS BEEN ENTERED THE ProMark2 WILL AUTOMATICALLY TRANSITION TO THE SITE DESCRIPTION FRAME**

POINT ATTRIBUTE (Cont'd)

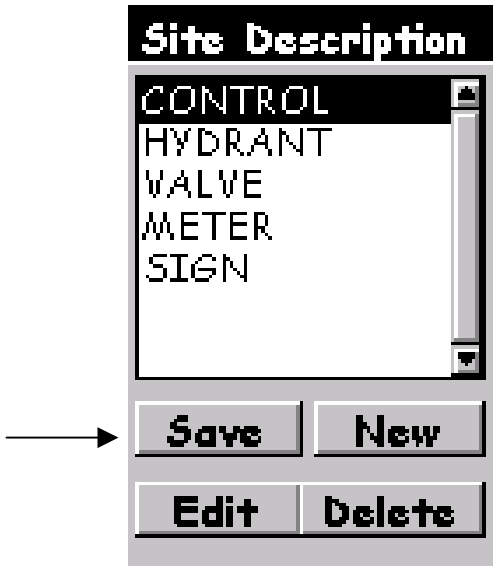
- SITE DESCRIPTION
- **ARROW KEY DOWN TO HIGHLIGHT SITE DESCRIPTION FRAME [LEFT]**
- **HIT: ENTER**
- **ARROW KEY LEFT OR RIGHT AND HIGHLIGHT: NEW—[CENTER]**
- **HIT: ENTER**
- **HIT: ENTER-THIS ACTION DISPLAYS THE DISCRIPTION SCREEN**

- **USE THE ARROW KEY TO HIGHLIGHT AND ENTER UP TO A MAXIMUM OF 20 CHARACTERES INTO THE DESCRIPTION FRAME**
- **ARROW KEY DOWN TO OK, THEN HIT: ENTER**



POINT ATTRIBUTE (Cont'd)

- SITE DESCRIPTION (Cont'd)
- **AFTER ENTERING THE SITE DESCRIPTION, THE SCREEN SEEN BELOW WILL APPEAR**
- **ARROW KEY LEFT OR RIGHT AND HIGHLIGHT: SAVE**
- **HIT: ENTER**
- **[NOTE: THESE SITE DESCRIPTIONS CAN BE SAVED, EDITIED, DELETED, OR RE-ENTERED AS A NEW DESCRIPTIVE BY HIGHLIGHTING THE BUTTONS VIA THE ARROW KEY.]**



- **[NOTE: AFTER SAVING THE SITE DESCRIPTION, THE RECEIVER WILL TRANSITION TO THE INITIALIZE FRAME**

POINT ATTRIBUTE (Cont'd)

ProMark2 INITIALIZATION

ProMark2 INITIALIZATION

- **THE PURPOSE FOR ProMark2 INITIALIZATION IS TO ENSURE THAT THE BASE AND ROVER RECEIVERS OBTAIN A <u>COMMON</u> GPS SOLUTION**

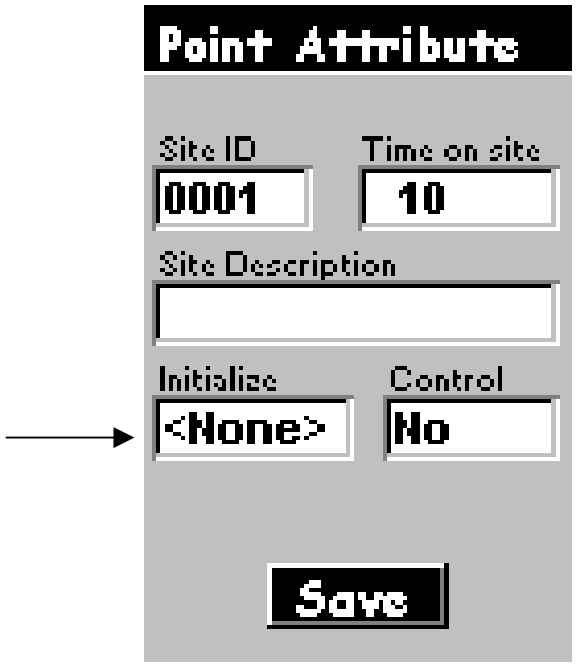
- **THE (OPTIONAL) INITIALIZATION BAR PROVIDES DUAL ANTENNA MOUNTS FOR THE ProMark2 BASE AND ROVER ANTENNAS TO SUPPORT INTEGER AMBIGUITY (e.g. Wavelength Count) MEASUREMENTS OF THE GPS SIGNALS BY THE RECEIVERS CONNECTED TO THEIR RESPECTIVE ANTENNAS**

- **THE DISTANCE BETWEEN THE ANTENNA MOUNTING POSTS ON THE INITIALIZATION BAR IS EXACTLY 20cm/.2m (0.656ft). THIS MEASUREMENT VALUE IS EQUIVALENT TO <u>ONE</u> WAVELENGTH OF THE TRANSMITTED GPS CARRIER ON L-BAND FREQUENCIES**

- **FOR STOP & GO SURVEYS, INITIALIZATION REQUIRES THAT <u>BOTH</u> RECEIVER ANTENNAS REMAIN STATIONARY ON THE INITIALIZATION BAR FOR A MINIMUM OF AT LEAST FIVE [5] MINUTES**

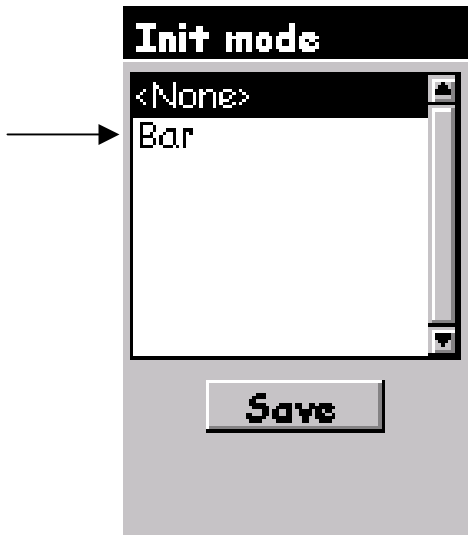
POINT ATTRIBUTE (Cont'd)

- INITIALIZE
- **THE INITIALIZE FRAME CAN DISPLAY AN OCCUPATION POINT SET ON AN INITIALIZATION BAR OR ON A KNOWN POINT. IF INITIALIZATION IS NOT REQUIRED, THIS FRAME WILL DISPLAY THE DEFAULT <NONE>**



POINT ATTRIBUTE (Cont'd)

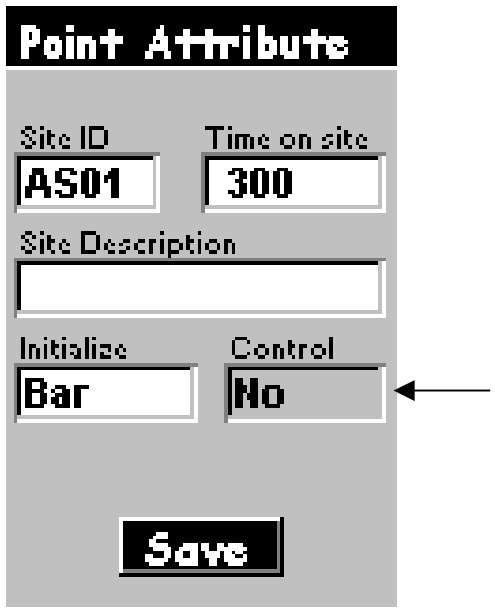
- INITIALIZE (Cont'd)
- **TO SET THE OCCUPIED POINT USING THE INITIALIZATION BAR**
- **SELECT: BAR**
- **HIT: SAVE**



- **NOTE: A CONTROL POINT CAN NOT BE ESTABLISHED WHEN INTEGER AMBIGUITIES (WAVELENGTH CYCLE MEASUREMENTS) ARE BEING RESOLVED VIA THE USE OF THE INITIALIZATION BAR. WHEN THE INITIALIZATION BAR IS USED THE TIME-ON-SITE WILL DEFAULT TO 300 SECONDS (5 MINUTES)**

POINT ATTRIBUTE (Cont'd)

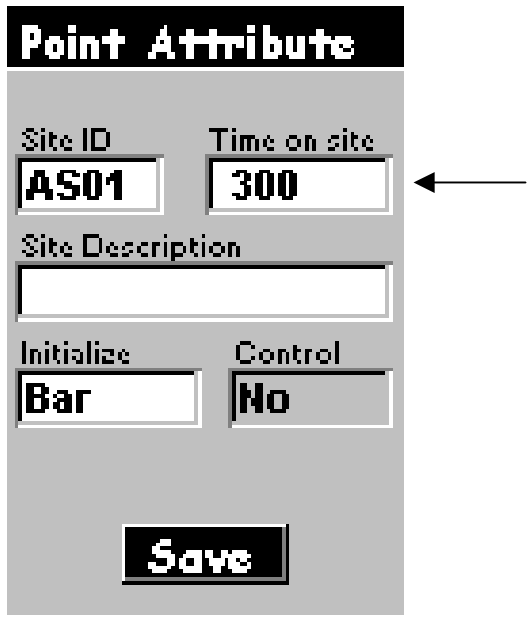
- INITIALIZE (Cont'd)
- **[NOTE: WHEN THE INITIALIZATION BAR IS SELECTED, THE FRAME MARKED CONTROL AUTOMATICALLY DEFAULTS TO NO.**



- **NOTE: A CONTROL POINT CAN NOT BE ESTABLISHED WHEN INTEGER AMBIGUITIES ARE BEING RESOLVED VIA THE USE OF THE INITIALIZATION BAR. IF THE INITIALIZATION BAR IS USED, THE TIME-ON-SITE FRAME WILL DEFAULT TO 300 SECONDS (5 MINUTES)**

POINT ATTRIBUTE (Cont'd)

- TIME ON SITE
- **ARROW KEY DOWN ONCE TO HIGHLIGHT: TIME ON SITE**

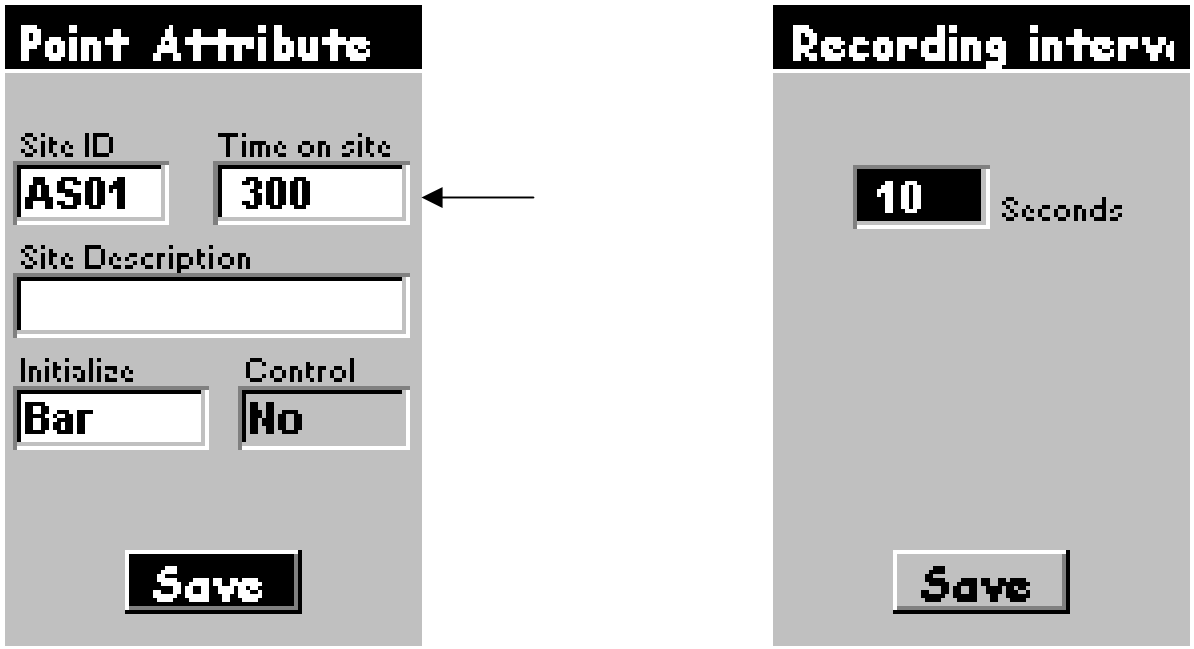


- **ARROW KEY LEFT OR RIGHT TO SELECT THE COLUMN FOR CHANGING THE NUMERICAL VALUE. ARROW KEY UP OR DOWN TO INCREMENT THAT NUMERICAL VALUE**

- **NOTE: THE INITIAL DEFAULT IN THIS FRAME IS 10 SECONDS**

POINT ATTRIBUTE (Cont'd)

- TIME ON SITE Cont'd)
- **NOTE: THE VALID RANGE SETTING FOR TIME-ON-SITE (LEFT) IS 1-9999 SECONDS. IF THE INITIALIZATION BAR IS USED, THE TIME-ON-SITE WILL DEFAULT TO 300 SECONDS (5 MINUTES)**



- **NOTE: IF THE TIME-ON-SITE VALUE IS LESS THAN THE DATA (EPOCH) RECORDING INTERVAL RATE (RIGHT) THAT VALUE WILL NOT BE ACCEPTED. THE TIME-ON-SITE FRAME WILL CHANGE TO DISPLAY THE EPOCH RECORDING INTERVAL**

POINT ATTRIBUTE (Cont'd)

- CONTROL
- **NOTE: IF BAR IS NOT SELECTED IN THE INITIALIZE FRAME IT WILL PERMIT THE USER TO SELECT THIS FRAME**

- **ARROW KEY DOWN TO HIGHLIGHT THIS FRAME**
- **HIT: ENTER**

- **IN THE CONTROL FRAME, YES IS AUTOMATICALLY HIGHLIGHTED. IF THIS OPTION IS SELECTED, IT WILL INITIALIZE THE KNOWN OCCUPIED POINT AND ASSOCIATE IT WITH THE SITE ID TABLE.**

- **IF NO IS SELECTED, THE POINT BECOMES A STANDARD OCCUPIED POINT**

- **HIT: ENTER TWICE TO SELECT AND SAVE THESE OPTIONS INTO MEMORY**

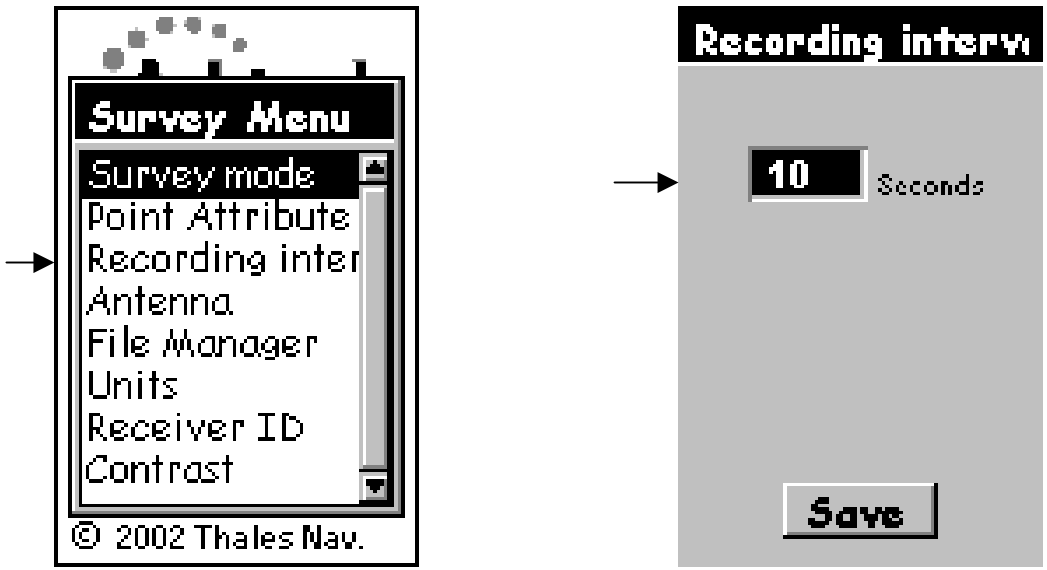
POINT ATTRIBUTE (Cont'd)

- CONTROL (Cont'd)
- **NOTE: THE RECEIVER WILL AUTOMATICALLY REVERT BACK TO THE SURVEY MENU SCREEN**

- **HIT: SAVE AGAIN TO PRESERVE ALL THE FRAME SETTINGS ON THE POINT ATTRIBUTE SCREEN**

RECORDING INTERVAL

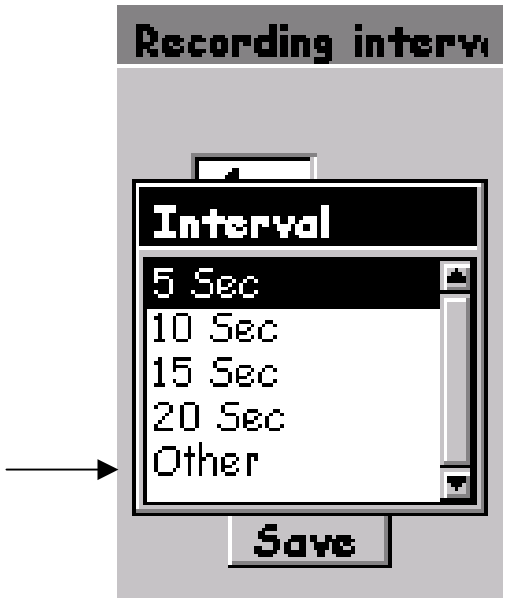
- RECORDING INTERVAL SCREEN
- **ON THE SURVEY MENU SCREEN, ARROW KEY DOWN AND HIGHLIGHT THE RECORDING INTERVAL OPTION**
- **HIT: ENTER**



- **NOTE: THE RECORD INTERVAL DEFAULT IS 10 SECONDS. THE BASE AND ROVER RECEIVERS MUST BE SET WITH THE SAME RECORDING INTERVALS. THE RECORDING INTERVAL IS DIRECTLY RELATED TO THE OCCUPATION TIME SPENT ON A SURVEY POINT**

RECORDING INTERVAL (Cont'd)

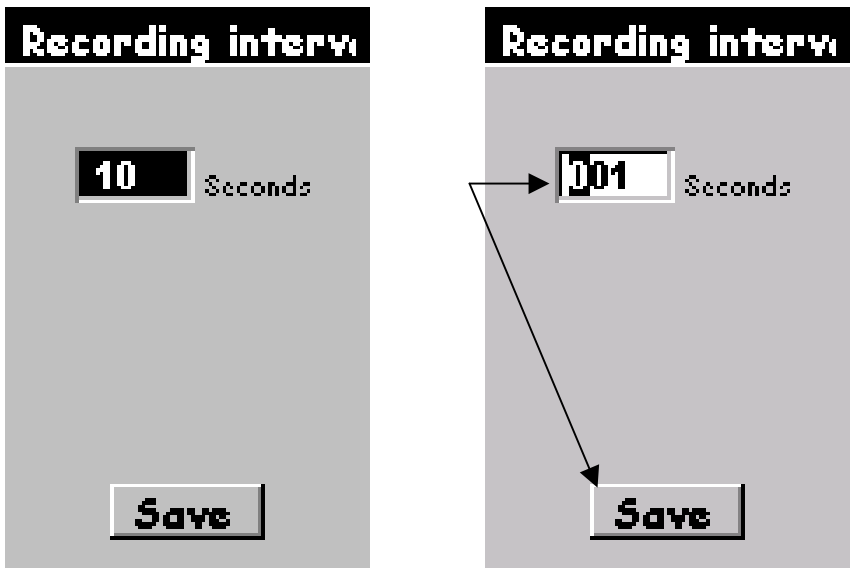
- RECORDING INTERVAL SCREEN (Cont'd)
- **HIT: ENTER**
- **THIS ACTION DISPLAYS THE INTERVAL FRAME WITH FIVE DATA RECORD TIME OPTIONS RANGING FROM 5 TO 20 SECONDS. IF THE DESIRED DATA RECORDING INTERVAL IS NOT ONE OF THE SELECTIONS SELECT: OTHER**



- **NOTE: THE MINIMUM RECORDING INTERVAL IS 1 SECOND. THE MAXIMUM EPOCH RECORD INTERVAL CAN NOT EXCEED 120 SECONDS DURATION. IF THERE IS ANY ATTEMPT TO ENTER A RECORD TIME VALUE ABOVE THIS LIMIT, THE INTERVAL WILL AUTOMATICALLY DEFAULT BACK TO 120 SECONDS**

RECORDING INTERVAL (Cont'd)

- RECORDING INTERVAL SCREEN (Cont'd)
- **TO SET THE RECORD INTERVAL WITH THE CURRENT DEFAULT SCREEN (LEFT)**
- **HIT: ENTER**
- **ARROW KEY DOWN AND HIGHTLIGHT: OTHER**
- **HIT: ENTER**
- **ARROW KEY LEFT OR RIGHT TO HIGHTLIGHT THE COLUMN FOR THE NUMERICAL CHANGE (RIGHT)**
- **ARROW KEY UP OR DOWN TO INCREMENT THE NUMERICAL CHANGE IN THE HIGHLIGHTED COLUMN**
- **HIT: ENTER**
- **HIT: SAVE**



ANTENNA

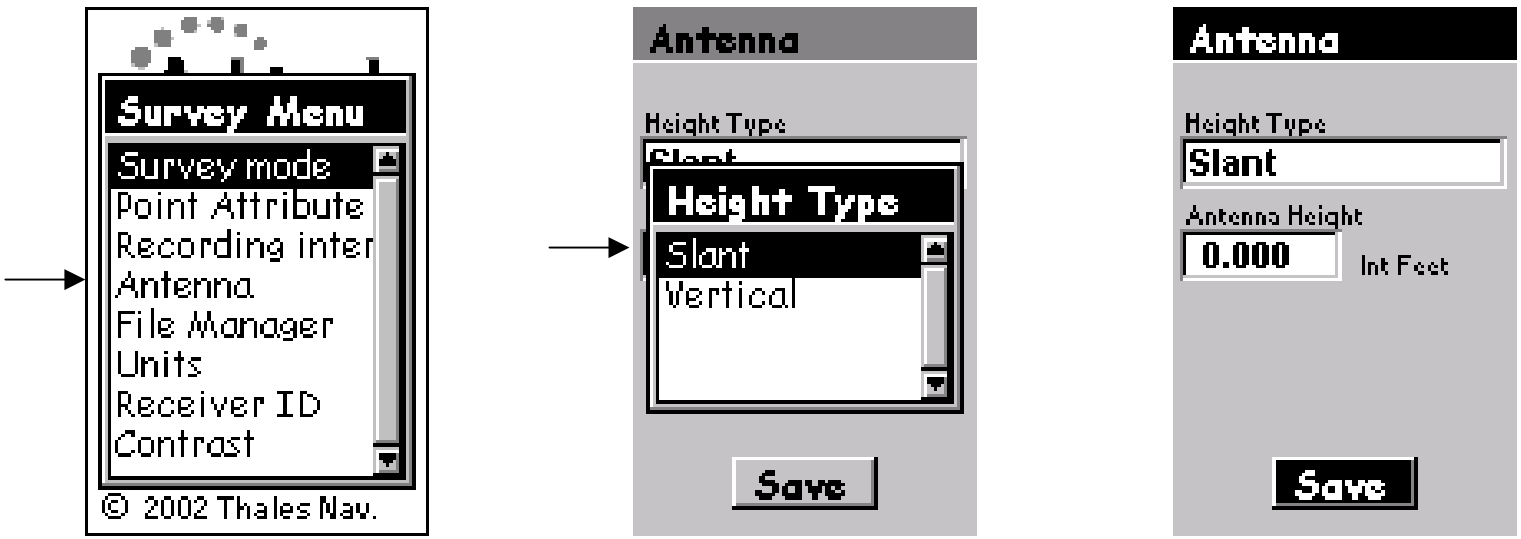
TECHNICAL NOTE

TAKING CORRECT ANTENNA HEIGHT MEASUREMENTS IS EXTREMELY IMPORTANT FOR DETERMINING PRECISE BASELINES AND AZIMUTH REFERENCES BETWEEN SURVEY POINTS. FOR STOP & GO SURVEYS, A FEW SPECIFIC POINTS WILL ADDRESS THE PROPER WAY FOR MEASURING ANTENNA HEIGHT INCLUDING THE OPTIONAL USE OF THE INITIALIZATION BAR

ANTENNA (Cont'd)

- SURVEY MENU
- **ARROW KEY DOWN AND HIGHLIGHT: ANTENNA**
- **HIT: ENTER**

- ANTENNA SCREEN
- **ON THE BASE HEIGHT TYPE FRAME HIGHLIGHT: SLANT**
- **HIT: ENTER**



BASE RECEIVER

ANTENNA (Cont'd)

- ANTENNA SCREEN (Cont'd)
- **SLANT IS SELECTED FOR THE BASE RECEIVER ANTENNA BECAUSE IT IS CENTERED DIRECTLY ABOVE THE SURVEY BENCHMARK. DURING INITIALIZATION THE BASE AND ROVER ANTENNAS ARE EXACTLY THE SAME HEIGHT**

- **MEASURING THE HEIGHT OF THE ROVER ANTENNA WHILE AFFIXED ON THE INITIALIZATION BAR WOULD NOT REPRESENT THE TRUE HEIGHT OF THE ANTENNA DUE TO THE EXTREME OFFSET ANGLE OF THE ANTENNA's POSITION FROM THE SURVEY BENCHMARK**

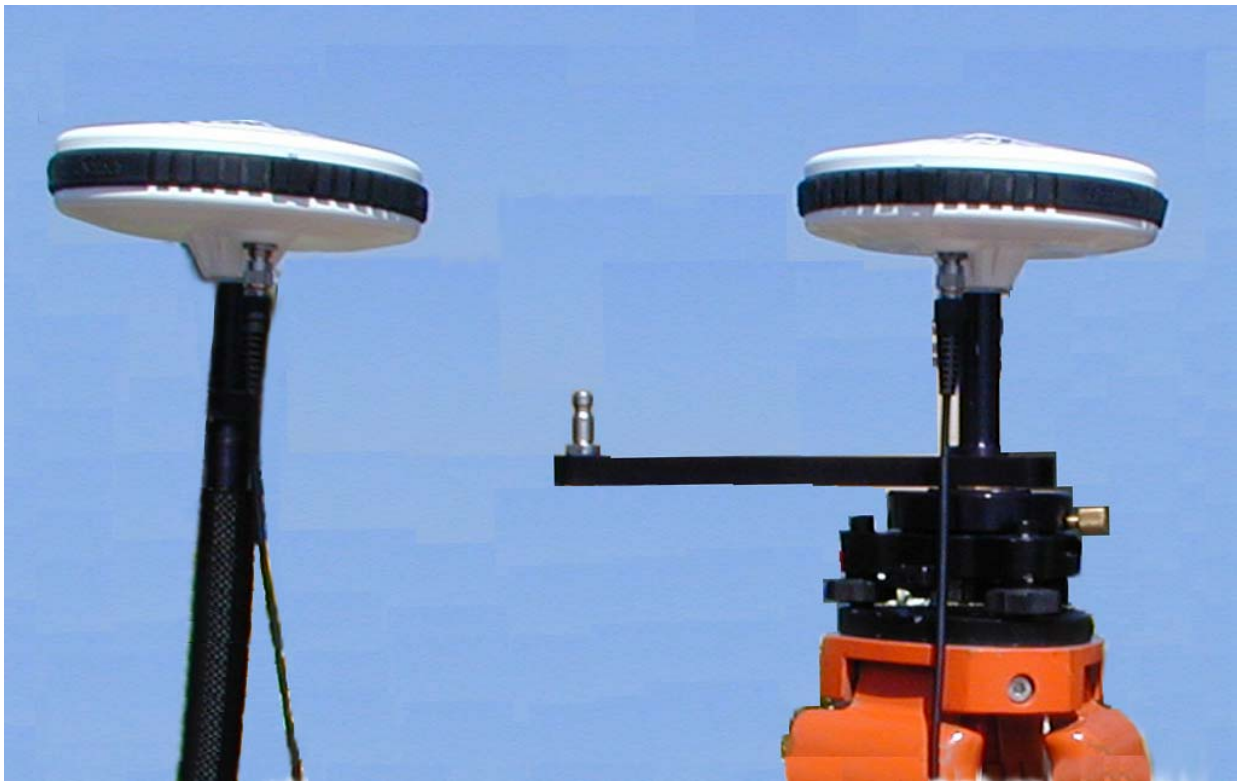
ANTENNA (Cont'd)

THE BASE RECEIVER ANTENNA HEIGHT IS MEASURED FROM THE SURVEY BENCHMARK TO THE SLANT HEIGHT MEASUREMENT POINT (SHMP) ON THE ANTENNA

SURVEY BENCHMARK

ANTENNA (Cont'd)

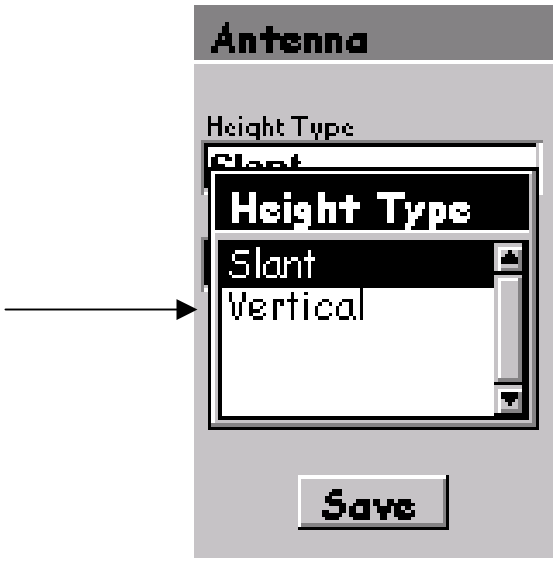
AT THE CONCLUSION OF THE INITIALIZATION PROCESS, TRANSFER THE ROVER ANTENNA FROM THE INITIALIZATION BAR TO THE ROVER POLE AND REMEASURE ITS HEIGHT



ROVER POLE

ANTENNA (Cont'd)

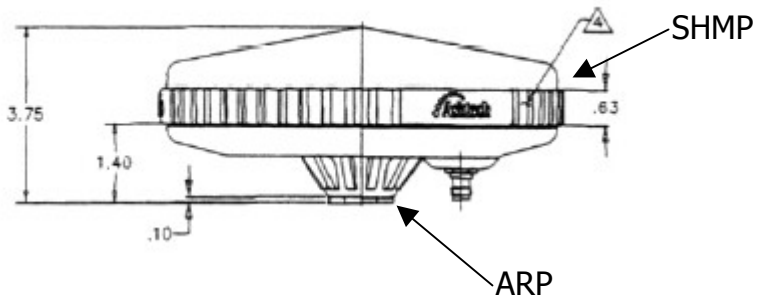
- ANTENNA SCREEN (Cont'd)
- **ON THE ROVER HEIGHT TYPE FRAME HIGHLIGHT: VERTICAL**
- **HIT: ENTER**



ROVER RECEIVER

ANTENNA (Cont'd)

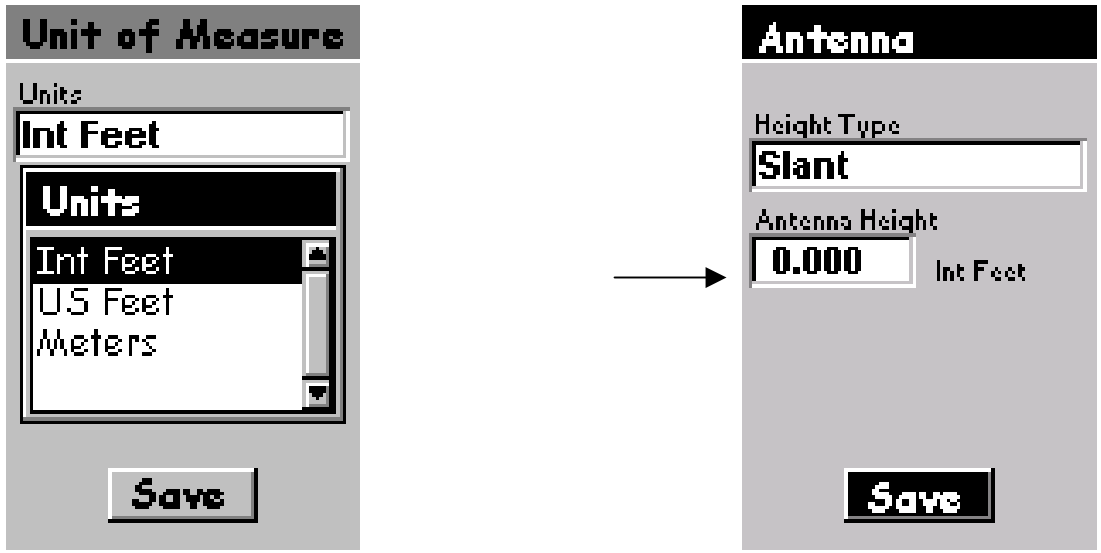
- ANTENNA SCREEN (Cont'd)



- **THE ROVER ANTENNA HEIGHT IS MEASURED FROM THE SURVEY BENCHMARK TO THE ANTENNA REFERENCE POINT (ARP) ON THE ANTENNA. THE ARP IS LOCATED AT THE BOTTOM OF THE ANTENNA WHERE IT ATTACHES TO THE ROVER POLE**

ANTENNA (Cont'd)

- ANTENNA SCREEN (Cont'd)
- **THE ANTENNA HEIGHT VALUES (LEFT) FOR THE BASE AND ROVER RECEIVERS MAY BE ENTERED IN INTERNATIONAL FEET, US FEET, or METERS**



- **IN THE ANTENNA HEIGHT FRAME (RIGHT) ARROW KEY LEFT OR RIGHT TO SELECT THE COLUMN FOR ENTERING THE NUMERICAL HEIGHT VALUE. ARROW KEY UP OR DOWN TO INCREMENT THAT NUMERICAL VALUE**

- **HIT: SAVE**

ProMark2 FAQ's

Q: What is kinematic initialization?

A: In the world of GPS, initialization is the process of determining the centimeter level of position solution. There are various field approaches to initialization depending on the type of GPS equipment being used. The ProMark2 allows for two [2] types of initialization:

--Occupation with the Initialization Bar or

--Occupation of a known point

Q: Do I have to use an Initialization Bar to achieve centimeter results?

A: An alternate method in initialization is called "known point initialization". This is when the rover occupies a known point as the first step in the kinematic survey. The known point will be used to initialize the centimeter level solutions. Therefore it's accuracy must be known to centimeter levels. Occupation time of a known point varies as a function of baseline length. The rule of thumb is 30 seconds plus 15 seconds per kilometer of baseline length.

GO TO MODULE THREE