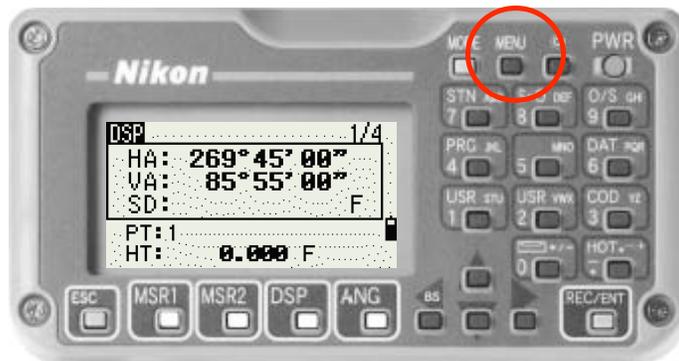


TST – Total Station Training

Session 1-3b Basic EDM Use

Creating a New Job

Assuming that the instrument has been set up and leveled, that the basic settings have been established, and that the measuring keys have been configured, the use of the total station as an EDM and data logger can proceed.



The first step is to create a "job", which is basically a data file with specific settings pre-selected as discussed earlier. The Job function is accessed through the Menu which is reached by pressing the **MENU** key.



Scrolling to the Job function and pressing **REC/ENT** or pressing **1** will bring up the Job Manager window. Note the "soft keys" (Creat, DEL, Ctrl, Info) at the bottom of the LCD display.

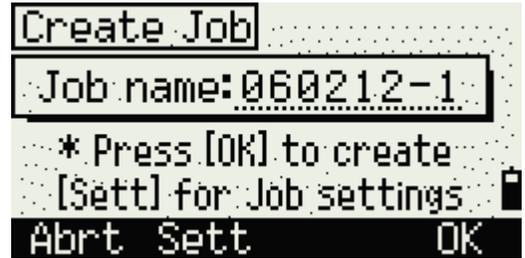


Pressing the **MSR1** key which corresponds to the **Creat** soft key brings up a window in which the job name can be customized.

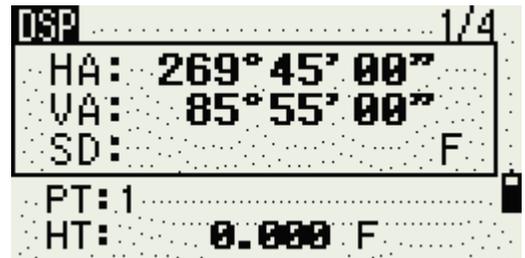


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Pressing the **REC/ENT** key brings up the Create Job window. Again, note the soft key choices. Sett allows a last chance to verify that the settings are correctly established prior to creating the job. Changing the settings after the job is created requires a new job to be created.

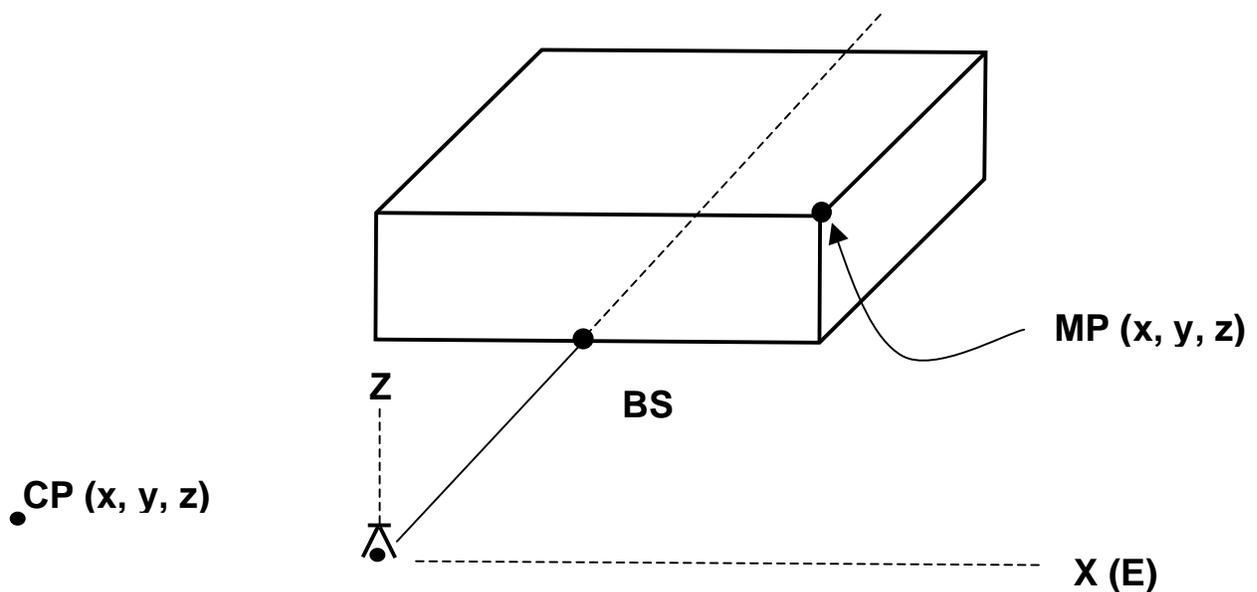


Pressing the **ANG** key, which corresponds to the **OK** soft key finishes the process of the job creation and returns back to the BMS.



### Setting Up a Station

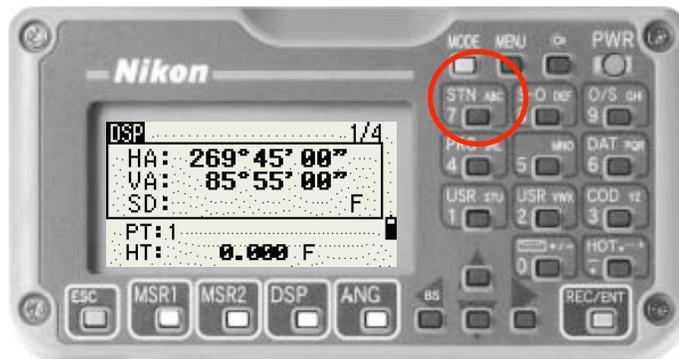
Setting up a station means establishing the instrument's location in 3-dimensional space. This location can either be set arbitrarily, (the user will establish a new grid reference system) or it can be tied into an existing grid reference system. This is one of the powerful attributes of a modern total station.



## TST – Total Station Training

If a new grid is to be established, some thought must be given before creating the first station. The desired orientation of the new grid will depend on a suitable Backsight (BS) being selected. The BS can be a prism, a reflector foil, or even a Phillips head screw on a wall plate. The current consensus is that for US&R use, a grid that follows that of the structure being monitored is desirable. This requires that the  $0^{\circ}$  Azimuth, or Horizontal Angle (HA) be roughly perpendicular to one face of the structure.

The second item is deciding the basic coordinates of the station to be established. Keeping the ordinates for the different axes substantially different (1000.00, 3000.00, 5000.00) will help prevent confusion when determining the magnitude and direction of any building movement. Remember that the station being created is a point on the ground below the instrument, so that the instrument can be removed and brought back and its new position within the 3-D grid established.



Access the Stn Setup menu by pressing the **STN** (7) key while in the BMS screen. In the Stn Setup menu there are seven choices to pick from; to see the final two you have to scroll through the menu items until you reach the second screen.



For the initial station set-up we will use option 1, **Known**. When re-establishing the location of a total station on an existing coordinate grid it is preferred to set up over previously established



### TST – Total Station Training

(known) points. It is possible to establish a station on an existing grid at an unknown location. We will show how to do this later in this section. We will use option 7, **Known Line** to do this.

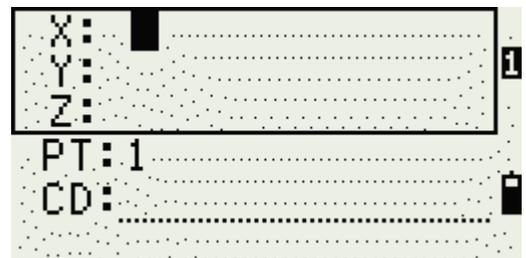
Pressing the **1** key, or the **REC/ENT** key, when the Known item is highlighted brings up the Input Station screen. If this was an existing coordinate grid with known points, it is easy to enter a known point and the total station would use the point's stored coordinates. Since we are demonstrating how to establish a new grid we will need to enter the station's known (arbitrarily set) coordinates. The total station is set to number all points sequentially, so we will start this station as **1**. We will use X, Y, Z coordinates of 1000, 2000, 100 feet. We will use an HI of 5.00 ft.



Enter the ST as "1" and press **REC/ENT**.



This brings up the coordinate input screen for point PT 1. Enter the value for x, 1000 ft, and press **REC/ENT**. Enter the value for y, 2000 ft, and press **REC/ENT**. Enter the value for z, 100 ft and press **REC/ENT**.



At this time we are not covering the use of point codes (the CD entry), therefore this line can be left blank. Pressing **REC/ENT** brings back the Input Station screen



**TST – Total Station Training**

The Height of Instrument (HI) is entered and pressing the **REC/ENT** key will bring up the Backsight (BS) screen which is needed to orient the coordinate grid we have just created.



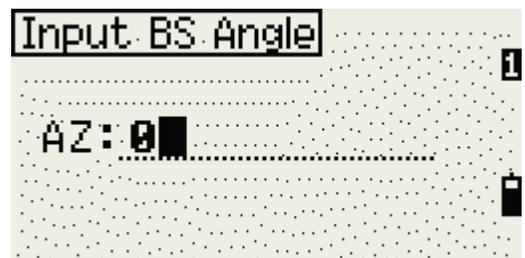
We have selected a point to use as a BS (on the structure we are going to monitor) which lies on a line roughly perpendicular to the structure. We will set the horizontal angle to this point to be our 0° horizontal angle. To do this we select option 2, Angle, and press **REC/ENT**, or the **2** key.



If we were using a point known to the total station we would enter that point's number on the line for BS. It is not necessary for this to be a point with known coordinates, only one that we can find again to re-establish the grid orientation. This being the case, we do not have to identify the BS and can skip by this entry by pressing the **REC/ENT**, key.



We are establishing that this point lies on the 0° horizontal angle, so enter 0 for AZ. and press the **REC/ENT** key.



This brings up the screen which sets the orientation of the 0° horizontal angle. The BS point that has been chosen is sighted through the telescope and the **MSR** key which corresponds to the type of reflector being sighted (reflector or reflector-less) is pressed.

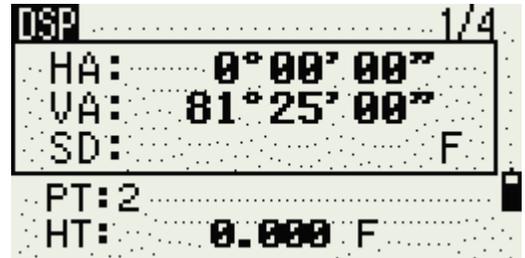


### TST – Total Station Training

This measurement sets the horizontal orientation of the grid. Pressing the **REC/ENT** key completes the station set-up process.

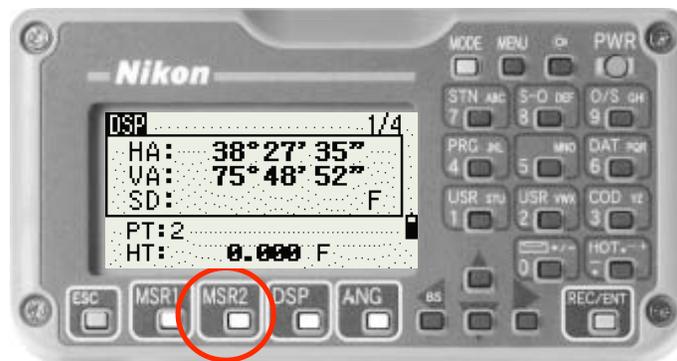


The total station is now ready to measure and record points, referenced to a known grid with a known orientation. It is now possible to dismantle the instrument and re-install it at this point, and knowing the BS, be able to re-establish the total station relative to this grid in three dimensions.

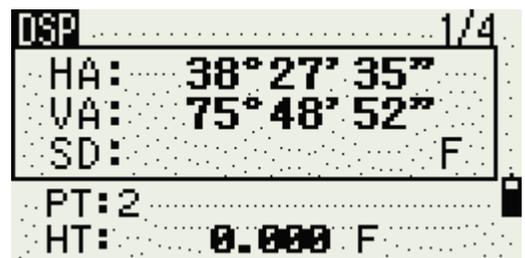


### Measuring and Recording Points

Now that the total station is set up, measuring and collecting points is straightforward. Depending on the type of target at the point to be monitored, press **MSR1** or **MSR2** to find the distance to that point. The total station will then compute the horizontal and vertical distance to the point and generate coordinates for that point.

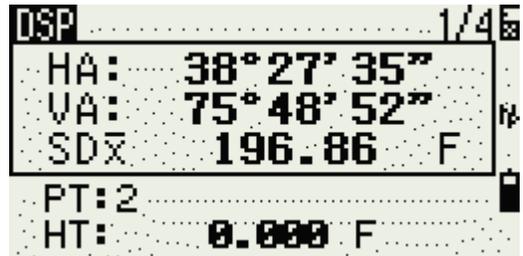


MSR1 and MSR2 can each be set up as prism-less or prism based measurements. We have set MSR2 up as prism-less. Press **MSR2**

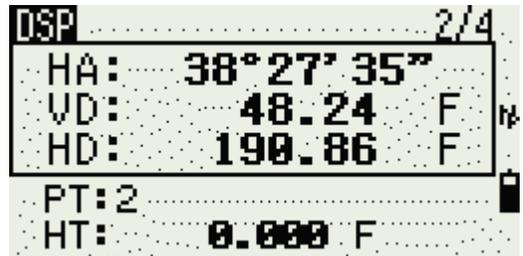


### TST – Total Station Training

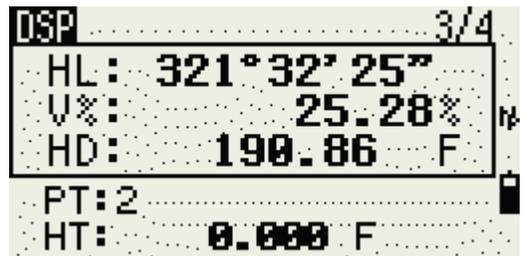
The total station determines the distance to the point and from that computes the other needed information.



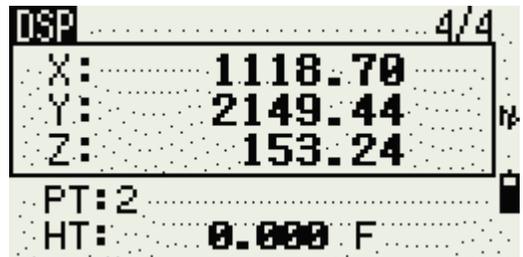
Press **DSP** to see the second BMS screen.



Press **DSP** to see the third BMS screen.



Press **DSP** to see the fourth BMS screen. This screen is the most useful when using the EDM features of the total station, comparable to the first screen when used as a theodolite.



Recording the information about a point is also straightforward. Pressing **REC/ENT** after measuring a point automatically records the data and brings up a blank entry screen for taking the next point's measurement data

