

3Dxi Operations

Once you have your 3Dxi™ excavator system set up, most grading operations remain the same. This chapter discusses operations typically performed while grading:

- changing the views
- changing cut/fill offsets
- changing the grade indicator scale
- checking position
- changing buckets
- changing the display options
- viewing GPS information
- copying files
- changing radio channels

Other application and operation functions described include the following:

- Steering and grading to a polyline
- Performing a topographic survey
- Clearing the NVRAM of the MC-2.5 Box

Before Grading Checklist

Before beginning to grade at the job site, review the setup procedures and ensure all steps have been completed.

- Base station is set up and functioning (page 4-1):
 - All cables securely attached (page 4-4)
 - Base station has power (page 4-5)
 - Base station initialized (page 4-6)
- Machine components attached and functioning:
 - Machine MC-A1 antennas (page 4-9) and Radio antenna (page 4-11) attached and cables connected
 - MC-2.5 Box attached and cables connected (page 4-12)
 - GX-60 control box attached and cables connected, and the control box powered on (page 4-13)
- Correct job files are active:
 - Control Point file (page 3-1)
 - Design Surface file (page 3-4)
 - Machine Configuration file (page 4-13)
- Check the color of the Elevation key to ensure all sensors are communicating and functioning:
 - GREEN – all sensors function properly
 - RED – a part of the system is working improperly; text or graphical information indicates the problem
- Perform a position check to ensure consistent grade (page 5-15).

Once all components are attached, connected to the GX-60 control box and functioning, you can begin grading.

Changing the View

The GX-60 control box can display several types of views, each of which contains useful information. Some options require specific files, provided from the design engineer or other sources on the project.

Main Window Views

Display options for the main window include a Plan view, a Section view, and a Profile view.

To access the desired main window view, press **Topcon Logo ▶ View ▶ Main window** (Figure 5-1), then tap the desired view; a check mark indicates the active view.

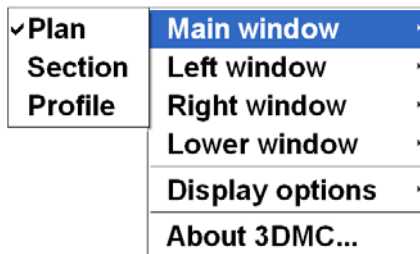


Figure 5-1. Main Window Display Menu Selections

The Plan view (Figure 5-2 on page 5-4) displays the jobsite from above the machine, and the main window is always oriented in the forward direction of machine travel.

This view allows for additional representations of triangle mesh and contour lines in a desired color; as well as superimposing Linework, Alignment lines, and Topo points.

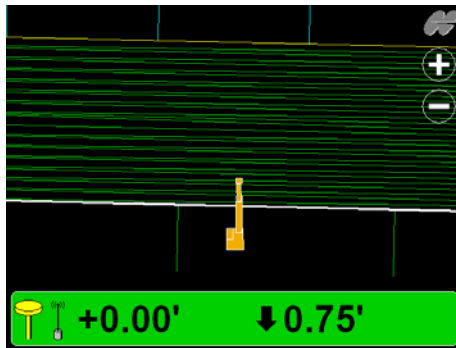


Figure 5-2. Plan View on Main Window

The Section view (Figure 5-3) displays a cross section of the cutting edge and the selected Design Surface where the right side of the Main Screen is the right side cutting edge.

- The cut/fill readings are provided on both sides of the blade and represent how far the cutting edge is from on-grade.
- When a road surface model is selected, the centerline and the elements on the template are represented in red.
- Additionally, the section view displays steering information from a target alignment line to a target edge and the longitudinal distance along the road.

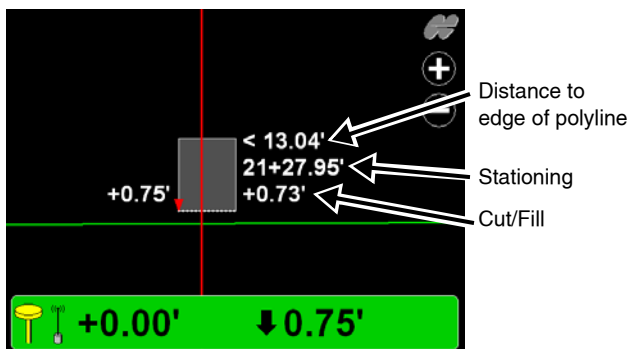


Figure 5-3. Section View on Main Window

The Profile view (Figure 5-4) displays a side view of the machine where the right side of the screen is always the forward direction of machine travel.

Use the focus body/bucket feature to center the machine on the screen as desired (see “Focus Body and Focus Bucket Views” on page 5-9).

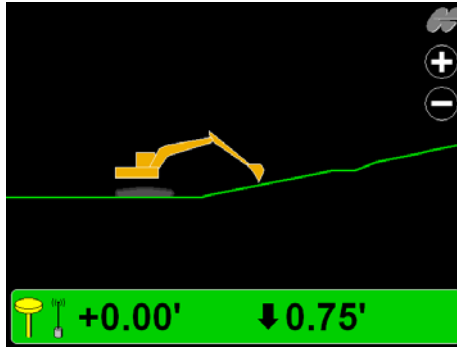


Figure 5-4. Profile View on Main Window

Left Window Views

Display options for the left window include a Profile view, a Section view, and a Grade indicator.

To access the desired left window view, have the Plan view visible and press **Topcon Logo ▶ View ▶ Left window** (Figure 5-5), then tap the desired view; a check mark indicates the active view. “None” indicates no left window is active.

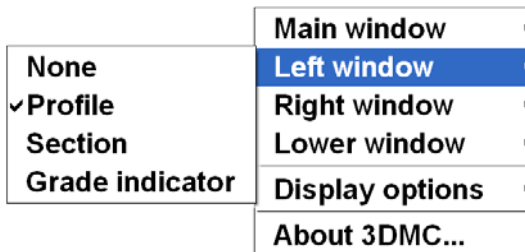


Figure 5-5. Left Window Display Menu Selections

Selecting one of the options adds the indicated view as a small window at the upper left of the display (Figure 5-6 on page 5-6).

The Profile view displays a side view of the machine where the right side of the view is always the forward direction of machine travel. The “+/-” buttons increase and decrease magnification for this view.

The Section view displays a cross section view of the cutting edge and the selected Design Surface where the right side of the view is the right side cutting edge. Cut/fill readings are provided on both sides of the blade and represent how far the cutting edge is from on-grade. The “+/-” buttons increase/decrease magnification for this view.

The Grade indicator view acts as an infinitely scrolling grade tape, displaying the amount of cut or fill in regards to the design surface. For details on the Grade indicator pop-up menu, see “Changing the Grade Indicator Scale” on page 5-13.

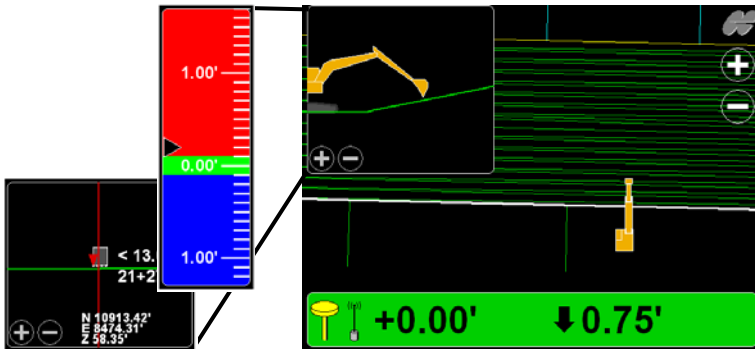


Figure 5-6. Left Window Views



The selected Left window view will remain visible when showing Right/Lower window views.

Right Window View

Only the grade indicator is available as a view in the right window.

To access the right window view, have the Plan view visible and press **Topcon Logo ▶ View ▶ Right window** (Figure 5-9 on page 5-8), then tap the desired view; a check mark indicates the active view. None indicates no right window is active.

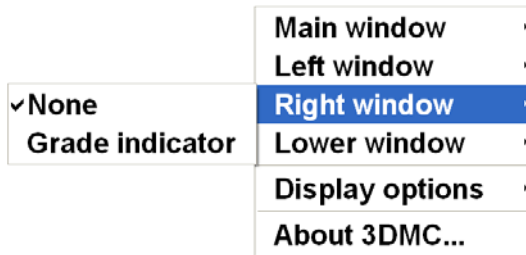


Figure 5-7. Right Window Display Menu Selections

Selecting one of the options adds the indicated view as a small window above the Elevation Control key (Figure 5-8).

The Grade indicator view acts as an infinitely scrolling grade tape, displaying the amount of cut or fill in regards to the design surface. For details on the Grade indicator pop-up menu, see “Changing the Grade Indicator Scale” on page 5-13.

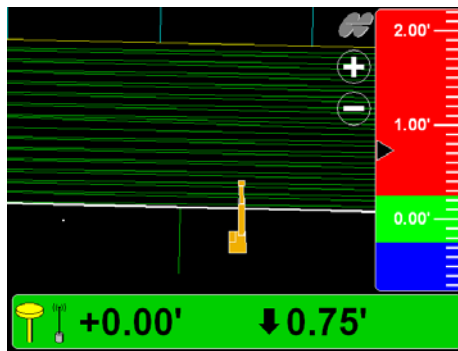


Figure 5-8. Right Window View



The selected Right window view will remain visible when showing Left/Lower window views.

Lower Window Views

Display options for the lower window include a Profile view, a Section view, and a Light bar.

To access the desired lower window view, have the Plan view visible and press **Topcon Logo** ▶ **View** ▶ **Lower window**, then tap the desired view; a check mark indicates the active view. None indicates no lower window is active.

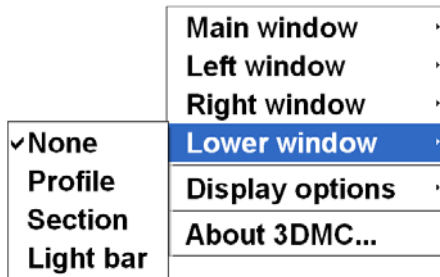


Figure 5-9. Lower Window Display Menu Selections

Selecting one of the options adds the indicated view as a small window above the Elevation Control key (Figure 5-10 on page 5-9).

The Profile view displays a side view of the machine where the right side of the screen is always the forward direction of machine travel. The “+/-” buttons increase/decrease magnification for this view.

The Section view displays a cross section view of the cutting edge and the selected Design Surface where the right side of the view is the right side of the cutting edge. Cut/fill readings are provided on both sides of the blade and represent how far the cutting edge is from on-grade. The “+/-” buttons increase/decrease magnification for this view.

The Light bar is used for steering indication where the green zone indicates “on-grade”. The zone can be increased or decreased using the Steer Indication screen. The Light Bar option is only available when the job includes alignment information.

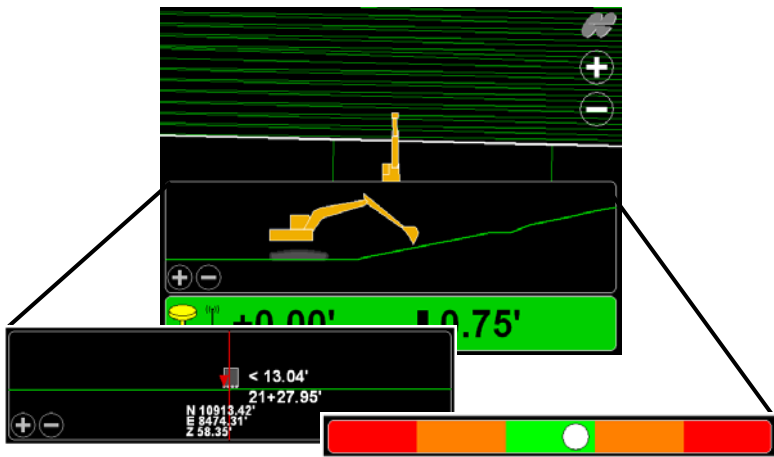


Figure 5-10. Lower Window Views



The selected Lower window view will remain visible when showing Left/Right window views.

Focus Body and Focus Bucket Views

The Plan and Profile Views can focus on either the body or the bucket. To change the focus, press the main screen for one to two seconds until the pop-up menu displays (Figure 5-11). A check mark indicates the currently active focus function.

- Use the Focus Body option to center the body of the machine in the view. Enter a number to add a forward offset to the view of the machine (zero will focus on the center of the body).
- Use the Focus Bucket option to center the bucket in the view.

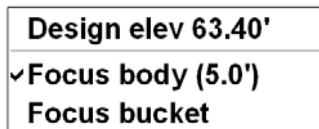


Figure 5-11. Popup Menu (Plan View)

The focus body and focus bucket options are available in the plan view and all profile views (Figure 5-12).

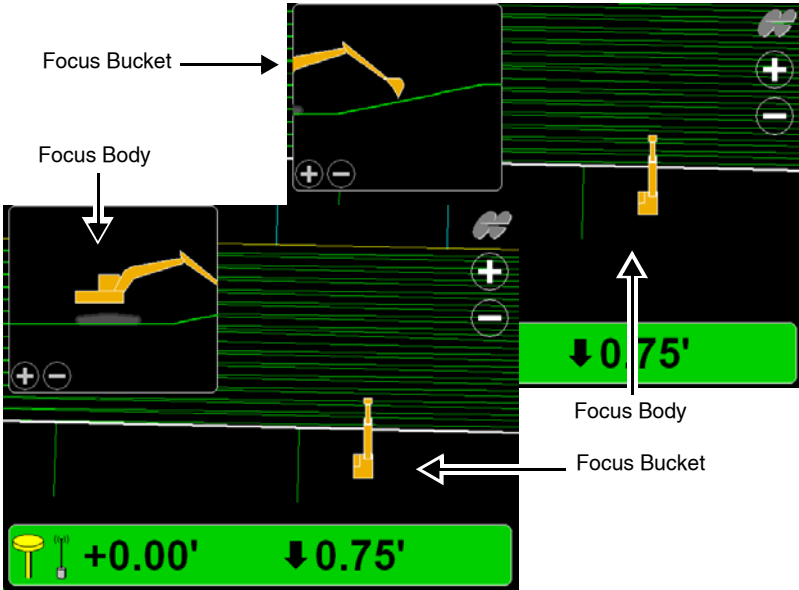


Figure 5-12. Focus Body and Bucket Examples for Plan and Profile Views

Setting the Elevation Reference

The elevation reference function selects the point along the bucket teeth that the elevation will be calculated from.

Using the Section view to change the elevation reference

To move to the far left or far right edge of the blade, press and hold the edge of the blade for one second. On the pop-up menu, tap **Move control left** or **Move control right**. The blade control arrow moves accordingly (Figure 5-13).

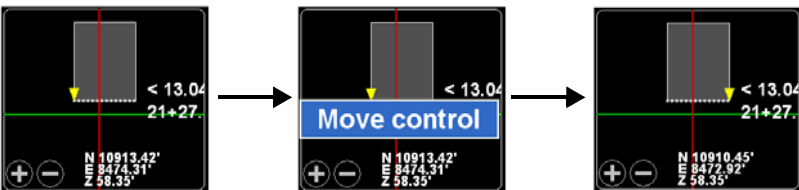


Figure 5-13. Move Elevation Reference Using Section View

Using the Control menu to change the elevation reference

1. Press **Topcon Logo** ▶ **Control** ▶ **Elev. reference**.
2. Select either *Left edge*, *Middle*, or *Right edge* of bucket.

The elevation reference arrow—seen on the teeth edge of the bucket in a section view—will move accordingly (Figure 5-14).

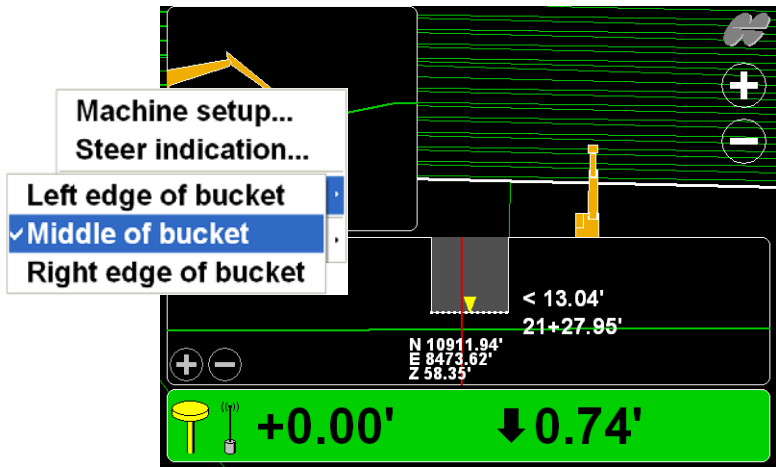


Figure 5-14. Elevation Reference on Bucket

Changing Cut/Fill Offsets

The cut/fill offset can be manually adjusted relative to the Design Surface. After each pass, the cut/fill offset can be updated as necessary while approaching the final design surface.

When changing the cut/fill offset, both the Elevation Control key and Grade Indicator reflect the new value.

1. On the 3DMC Main Screen, press the **Elevation Control** key to display the *Adjust elevation* dialog box (Figure 5-15).
2. Press the *Elevation set point* **Set** key, changing it to red.

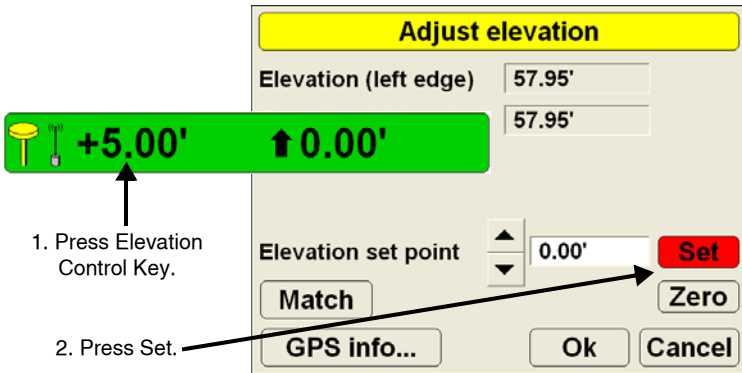


Figure 5-15. Press Elevation Control Key then Set

3. Tap the *Elevation set point* entry box, and enter a new offset using the numerical keyboard. Press **Ok**.
A negative value is a Cut; a positive value is a Fill.
4. Press **Ok** to set the new offset value and return to the 3DMC Main Screen.

Changing the Grade Indicator Scale

The Grade Indicator acts as an infinitely scrolling grade tape, and displays the amount of cut or fill in regards to the design surface.

To view the grade indicator, press **Topcon Logo ▶ View ▶ Left window ▶ Grade indicator**. This process applies to both the left and right Grade Indicators.

To change the grade display, press and hold the **grade indicator for one second**, tap **Grade display**, then the desired option. This option applies a cut/fill reference for a position on the cutting edge.

- At left edge – the grade tape follows the position left edge of the bucket.
- In from edge – the grade tape follows a position on the bucket an entered distance from the left edge. Tap to display the numeric pop-up keyboard to enter a distance from the left edge.

Example: Left Edge

When using the Left Edge, the grade tape will follow the cut/fill status of the left side of the bucket, regardless if elevation reference point is at the middle or right edge of the bucket. The cut/fill number in the elevation control key is tied directly to the Elevation Reference point.

The Elevation Control Key reflects the elevation reference point.

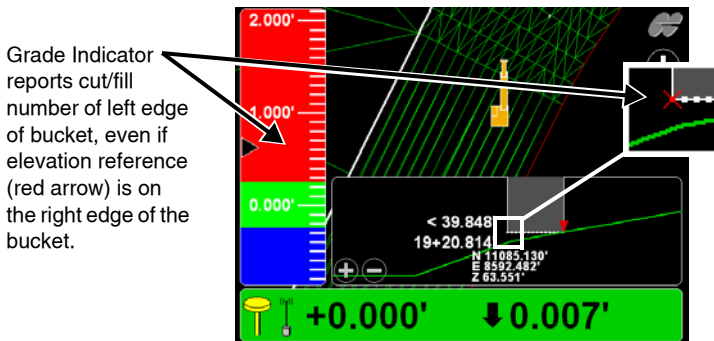


Figure 5-16. Example: Grade Indicator and Left Edge Cut/fill

Example: In From Edge

When using In From Edge, the grade tape will follow the cut/fill of the entered distance from the left side of the bucket, regardless if elevation reference point is at the middle or right edge of the bucket. The cut/fill number in the elevation control key is tied directly to the Elevation Reference point.

The Elevation Control Key reflects the elevation reference point.

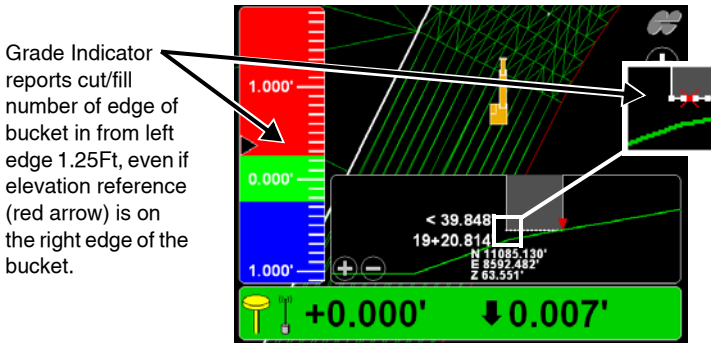


Figure 5-17. Example: Grade Indicator and In From Left Edge Cut/fill

To change the on-grade or extents, press and hold the grade indicator for one second, then tap the desired menu option (Figure 5-18).

- On-grade – displays the current on-grade (green zone) width. Tap to change the on-grade zone.
- Extents – displays the current scale (unit spacing) for the grade indicator. Tap to change the unit spacing.

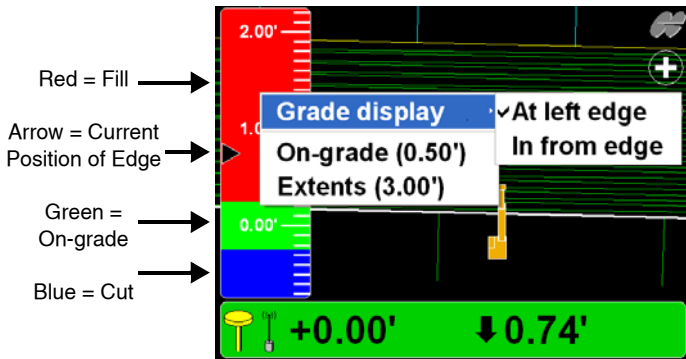


Figure 5-18. Grade Indicator Pop-up Menu

Checking the Position of the Bucket Teeth

The position check option provides a daily benchmarking tool to verify that the calculated elevation and position are repeatable.

1. To check the position of the blade, press **Topcon Logo ▶ Tools ▶ Position check**.
2. On the *Position Check* dialog box, select the *Point of interest* (left edge or right edge of bucket), and press **Measure** (Figure 5-19); the *Measuring* dialog box displays during measurement.
3. When finished, the *Position check* dialog box displays the point on the job for the selected edge of the blade (Figure 5-19).
4. Record the position and verify the accuracy of the measurement with a survey Rover.
5. Press **Cancel** to return to the Main Screen.

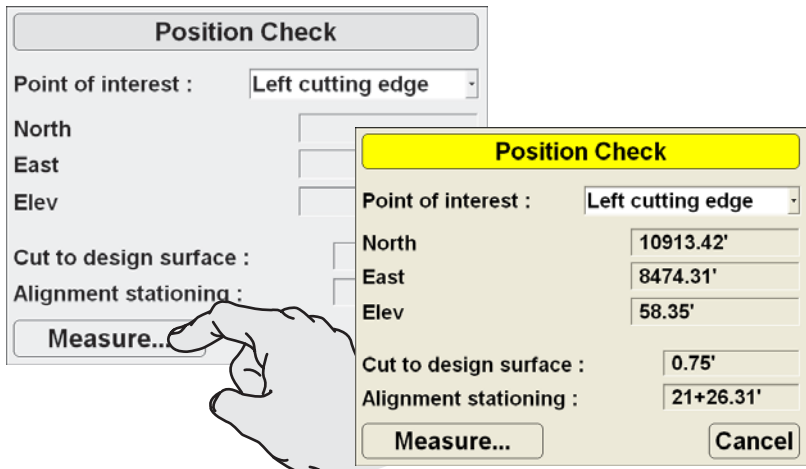


Figure 5-19. Select Point of Interest and Press Measure

Changing Buckets

The 3DMC application software can be configured with up to six bucket setups.

- If mounted to a quick change coupler or the dog-bone, the TS-1 will remain on the coupler when the bucket changes.
- Without mounting on a quick change coupler or dog-bone, the TS-1 will have to be re-calibrated (see Appendix A for details).

When changing buckets, the new bucket must be set up in 3DMC and will be listed in the Control ▶ Bucket menu. For the bucket setup procedure, see “Machine Configuration File for 3Dxi” on page 4-13. Bucket setups can be updated at any time.

Click **Topcon Logo ▶ Control ▶ Bucket** and select the new bucket from the list (Figure 5-20). A check mark indicates the currently selected bucket. (Note that in this example, the default names are used for the buckets.)

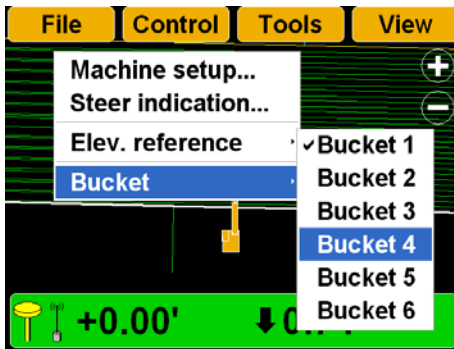


Figure 5-20. Select New Bucket

Changing the Display Options

The GX-60 control box also contains settings for the various displays available that can be changed to fit the job. Some options require specific files, provided from the design engineer or other sources on the project.

Design Surface Display Options

When using a TIN surface model file, press **Topcon Logo ▶ View ▶ Display options ▶ Design Surface** to display the *Design surface* dialog box (Figure 5-21).

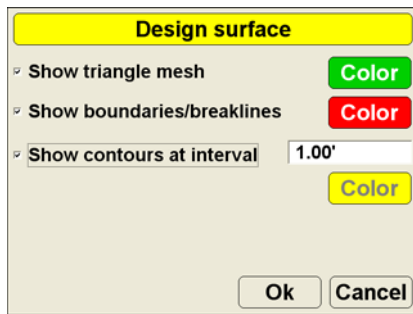
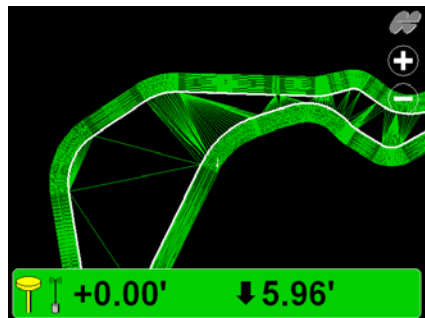
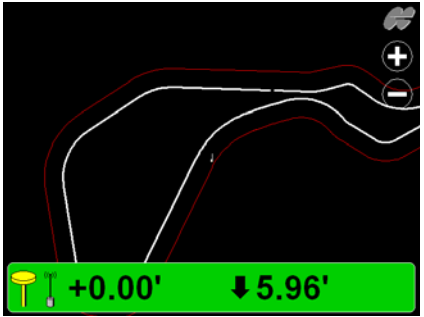
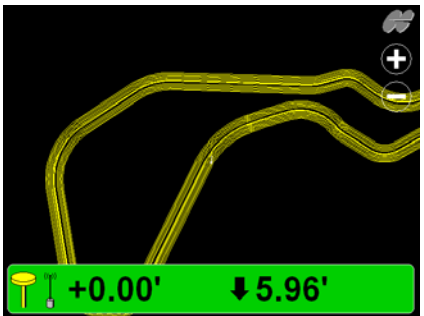
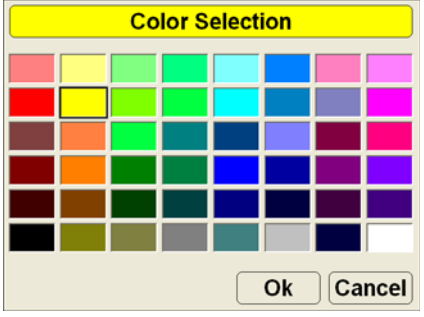


Figure 5-21. Design Surface Display Options

This dialog box has the following selections:

- Show triangle mesh – displays triangle lines on the Main Screen according to the TIN Surface Model.



<ul style="list-style-type: none"> • Show boundaries/ breaklines – displays boundary lines and breaklines outlining the Design Surface. 	
<ul style="list-style-type: none"> • Show contours at intervals – displays contour lines on the Main Screen; tap the entry box to display the numeric pop-up keyboard and specify the elevation spacing interval between lines. 	
<ul style="list-style-type: none"> • Color – press to display the <i>Color Selection</i> dialog box. You can change the color of the triangle mesh, boundary/ breaklines, and contours to the operator's preference, or to maintain consistency between the office and the field. 	

Alignment Display Options

When using either a road surface model or an alignment file, press **Topcon Logo ▶ View ▶ Display options ▶ Alignment** to display the *Alignment* dialog box (Figure 5-22).

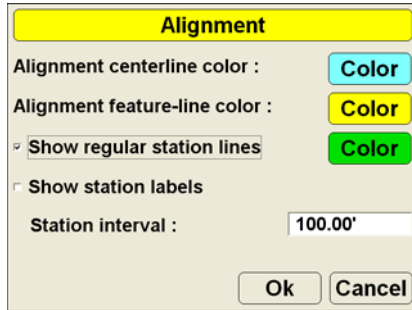


Figure 5-22. Alignment Display Options

This dialog box has the following selections:

- Alignment centerline color – sets the color of the centerline.
- Alignment feature-line color – sets the color for feature lines.
- Show regular station lines – displays graphical cross lines relative to the horizontal alignments on the Main Screen (Figure 5-23). Press the **Station interval entry box** to specify the longitudinal interval between lines.

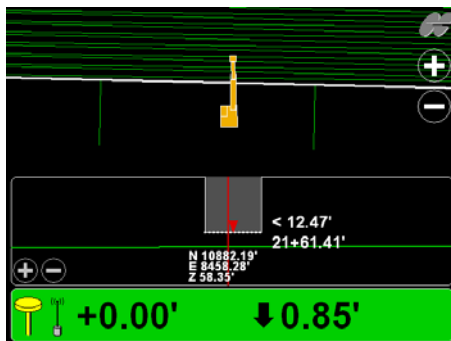


Figure 5-23. Station Lines in Main Screen

- Show station labels – displays station labels for each station on the Main Screen.

Linework Display Options

When using a Linework file, press **Topcon Logo** ▶ **View** ▶ **Display options** ▶ **Linework** to display the *Linework layers* dialog box (Figure 5-24).

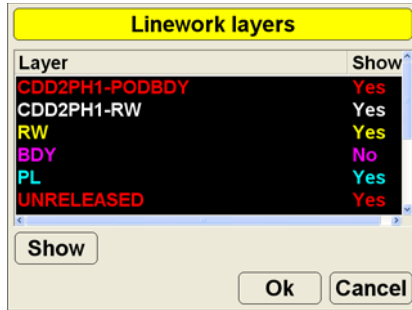


Figure 5-24. Linework Layers

The Linework file contains layers composed of a group of lines, each identified with a color. All layers will be listed in the *Linework layers* dialog box.

1. To display desired layers on the Main Screen, select the layer and press **Show**, “Yes” displays in the *Show* column. Press **Show** again to hide the layer on the Main Screen; “No” displays in the *Show* column.
2. Press **Ok** to return to the Main Screen (Figure 5-25).

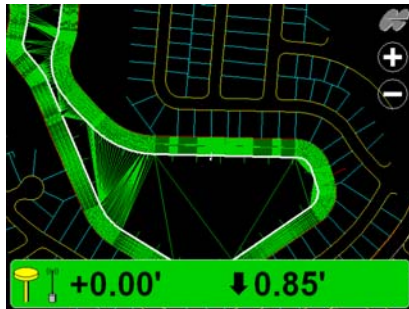


Figure 5-25. Linework Display – Main Screen

Point Display Options

When using a Point file, press **Topcon Logo** ▶ **View** ▶ **Display options** ▶ **Points** to display the *Points* dialog box (Figure 5-26). Select a layer and then the information to show for points in that layer.

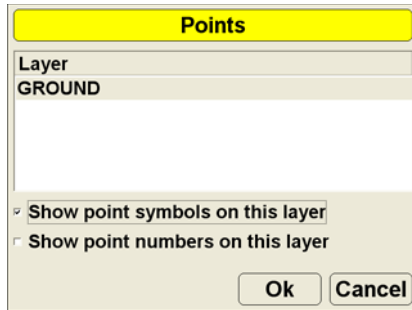


Figure 5-26. Points Display Options

This dialog box has the following selections:

<ul style="list-style-type: none"> • Show point symbols on this layer – displays all points for the selected layer on the Main Screen. Active measure points also display while performing the Topo Survey function. 	
<ul style="list-style-type: none"> • Show point numbers on this layer – displays the point numbers over the symbols for each point. The numbers will display while in the Topo Survey function. 	

Changing the Background Color

1. To change the background color of the Main Screen, press **Topcon Logo ▶ View ▶ Display options ▶ Background color** to display the *Color Selection* dialog box.
2. Select a color from the *Color Selection* dialog box and press **Ok** to apply the change.

Display Units Options

To set the type of units used in the job, press **Topcon Logo ▶ View ▶ Display options ▶ Display units** to display the *Display Units* dialog box (Figure 5-27).

Use this dialog box to change the type of units displayed on the screen or update preset units in the files currently being used. Note that any conversion will not affect grade accuracy.

- Distances – select either Meters, US survey feet, or International feet. Also select the number of decimal places, from zero to four.
- Angles – select either DD° MM'SS", NDD° MM'SS", or Gons.
- Grades – select either Percent (%) or Run : Rise.
- Stations – select either 100.000, 1+00.000, or 10+0.000.
- Volumes – select either Cubic meters or Cubic yards.
- Coordinates – select either North-East-Elev, East-North-Elev, or X-Y-Z.

Display Units	
Distances	US Survey feet 2 d.p.
Angles	DD°MM'SS"
Grades	Percent (%)
Stations	1+00.000
Volumes	Cubic yards
Coordinates	North-East-Elev
<input type="button" value="Ok"/> <input type="button" value="Cancel"/>	

Figure 5-27. Display Units Dialog Box

Viewing GPS Information

To view the *GPS information* dialog box and tabs, press the **Elevation control** key, then press the **GPS info** button (Figure 5-28).

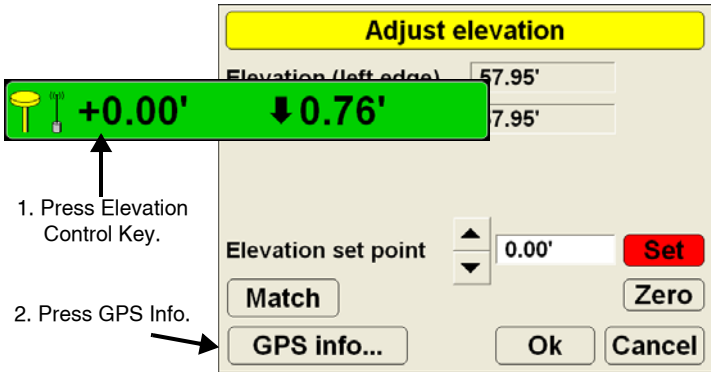


Figure 5-28. View GPS Information

The following sections describe the *GPS information* tabs.

Viewing GPS Status and Quality

The *Fix* tab displays satellite status and positioning quality based on GPS satellites currently being tracked (Figure 5-29). Once a GPS solution is initialized, the GX-60 control box reports the Fix status. The positioning quality is an estimation computed from valid satellite status (RMS: Root Mean Square).

Fix	Position	Satellites	ID	Planning
Initialized !				
Total sats tracked			16	
GPS sats used			9	
GLONASS sats used			5	
Horizontal RMS			0.05'	
Vertical RMS			0.07'	
<input type="button" value="Ok"/> <input type="button" value="Cancel"/>				

Figure 5-29. GPS Info – Fix Tab

Viewing the Cutting Edge Position

The *Position* tab displays the current location of the left and right sides of the cutting edge (Figure 5-30). These values are based on the local site coordinates, providing quick position and elevation checks at particular points on the project.

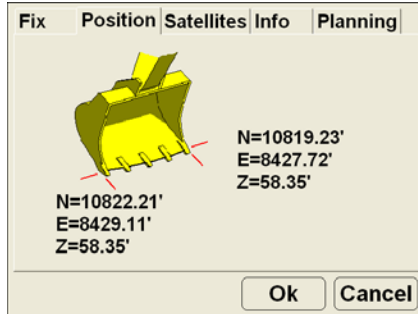


Figure 5-30. GPS Info – Position Tab

Viewing Satellite Location and Changing the Mask Angle

The *Satellites* tab displays the current location of all available GPS satellites (Figure 5-31). Blue dots are GPS satellites, red-with-cross dots are GLONASS satellites, and black dots are unused satellites.

To set or change the mask angle, tap the **Mask angle** entry field and enter the angle of degrees above the horizon to track satellites above (usually 15), and press **Ok**. The red circle will change accordingly.

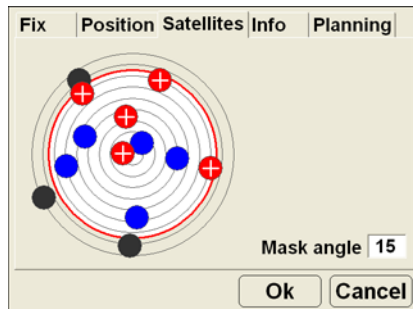


Figure 5-31. GPS Info – Satellites Tab

Viewing Receiver Information and Resetting the Receiver/RTK

The *ID* tab displays identification and firmware revision level for the internal GPS receiver of the MC-2.5 Box (Figure 5-32). It also displays radio link information (type, latency, and quality).

- The Reset RTK key resets RTK ambiguities.
- The Reset receiver key clears all data and resets all settings stored in the GPS receiver (that is, it clears the NVRAM).

Fix	Position	Satellites	Info	Planning
Receiver ID		1234567		
Firmware		Version 2.2		
Radio link :		CMR,age=3s,100%		
<input type="button" value="Reset RTK"/>				
<input type="button" value="Reset receiver"/>				
				<input type="button" value="Ok"/> <input type="button" value="Cancel"/>

Figure 5-32. GPS Info – ID Tab

Viewing Satellite Planning Information

The *Planning* tab displays the estimated grading precisions on an hourly scale (Figure 5-33 on page 5-26). The **Next** key displays the chart for the next day; the **Prev** key displays the chart for the previous day.

This tab provides useful information for predicting GPS solution accuracy for grading. The red vertical line marks the current time.

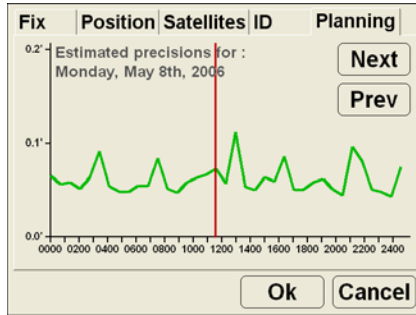


Figure 5-33. GPS Info – Planning Tab

Copying Files

You can copy any of the file types from a USB storage device to the GX-60 control box, and vice versa.

The example below uses the *Control point files* dialog box, but any Control point, Surface, Alignment, Linework, Points, or Machine Configuration file can be copied.

1. Insert a USB device into the USB port on the control box, and turn on the control box.



Occasionally, the GX-60 control box may not properly detect the USB device into the USB port during a hot-swap procedure. If this occurs, simply turn off and restart the control box.

2. When the 3DMC main screen displays, click **Topcon Logo ▶ File** and then the desired file type (Figure 5-34 on page 5-27).
3. Press **Copy** to display the *Copy files* dialog box.
 - To copy from the USB storage device to the control box, select “from data card to internal disk” from the *Copy* drop-down list, then select the Design Surface file from the displayed files (Figure 5-34 on page 5-27).

- To copy from the control box to the USB storage device, select “from internal disk to data card” from the *Copy* drop-down list.
4. Tap the desired file from the displayed files and press **Ok** to begin the copy process. An hourglass displays, indicating that the system is busy.

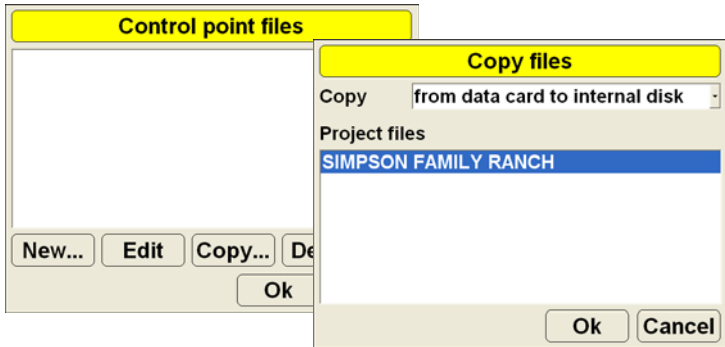


Figure 5-34. Select File To Copy

Changing Radio Channels

If needed, you can use the GX-60 control box to change the radio channel of the radio modem in the MC-2.5 Receiver Box.



Some radio modems, such as Teledesign and Spread Spectrum, have an automatic channel scanning feature, allowing them to detect and connect with the Base Station without having to manually select the radio channel using the GX-60 control box.

Since the MC-2.5 receiver box stores radio settings, including the radio channel, follow the steps below to change the radio channel setting.

1. Tap **Topcon Logo** ▶ **Tools** ▶ **Configure radio**.
2. On the *radio setup* dialog box (Figure 5-35 on page 5-28), press **Configure** (if available) to run the radio setting program.

The program may take a few seconds to a few minutes to connect to the radio module and check the current setting.

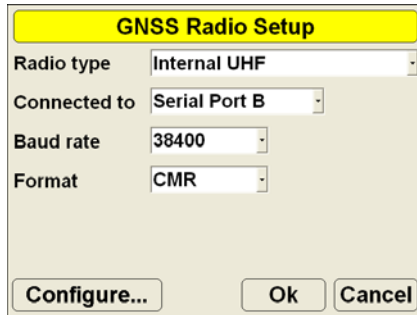


Figure 5-35. Run Radio Setting Program

When the current setting is confirmed, the radio's channel and frequency information displays (Figure 5-36).

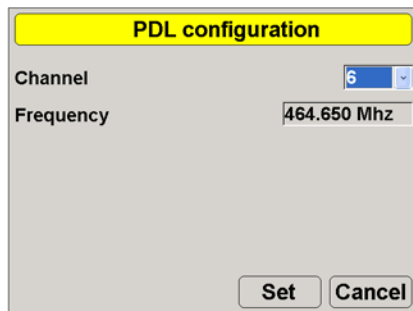


Figure 5-36. Radio Configuration Information

3. Press the *Channel* drop-down list to select the desired channel number. The frequency of the channel changes automatically depending on the selected channel.
4. Press **Set** to activate and save the new radio channel setting. The radio setting program may take a few seconds to a few minutes to program and complete the process.



If you have difficulty connecting to the radio module when changing radio configurations, disconnect the radio antenna cable at the MC-2.5 Box. The Base Station radio can interfere with the machine's radio when making changes.

Steering and Grading to Polyline

The GX-60 control box can be used to steer the machine to a polyline and cut to a polyline layered in the Linework file. Typically, you use an Alignment file to cut along an alignment line. The polylines represent features or objects such as building pads, curbs, sidewalks, top and toe of slopes, or any boundary on the project. If the polyline is composed of three dimensional information at each transition point, it can be selected on the Main Screen and used as the alignment line to steer to, or can be used as the Design Elevation to control the cutting edge.

Setting the Steer Indication

1. Press **Topcon Logo** ▶ **Control** ▶ **Steer indication**.
2. Select and enter the following information; the selected alignment for the job also displays.
 - Point of interest – a location on the bucket to steer by.
 - Alignment feature – a feature of the alignment to steer to
 - Additional steer offset – an offset from the feature to apply
 - Light bar green zone – the on-grade portion of the lightbar
3. Press **Ok**.

Steer Indication	
Alignment :	Inner perimeter of lake
Point of interest :	Left cutting edge
Alignment feature :	Centerline
Additional steer offset :	0.00'
Light bar green zone :	0.20'
<input type="button" value="Ok"/> <input type="button" value="Cancel"/>	

Figure 5-37. Set Steer Indication

Steering to Polyline

1. Press **Topcon Logo** ▶ **Linework** and select the correct Linework file. Press **Ok**.
2. Press **Topcon Logo** ▶ **View** ▶ **Display options** ▶ **Linework** and select the polylines to display. Press **Show**. See “Linework Display Options” on page 5-20 for more information.
3. View the steering light bar and left section view:
 - **Topcon Logo** ▶ **View** ▶ **Lower window** ▶ **Light bar**
 - **Topcon Logo** ▶ **View** ▶ **Left window** ▶ **Section**
4. Tap the polyline to use for steering on the Main Screen, and tap **Steer to polyline** on the pop-up menu; graphical cross lines display along the selected polyline.

Figure 5-38 shows an example of the Main Screen after completing the above steps. In this example, the machine needs to move left 1.80'.

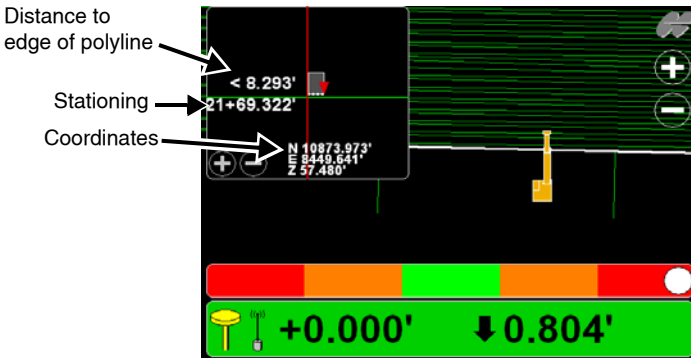


Figure 5-38. Steer To Polyline

5. Press **Topcon Logo** ▶ **View** ▶ **Display options** ▶ **Alignment** to change the interval between cross lines and the steering indication (Figure 5-39).

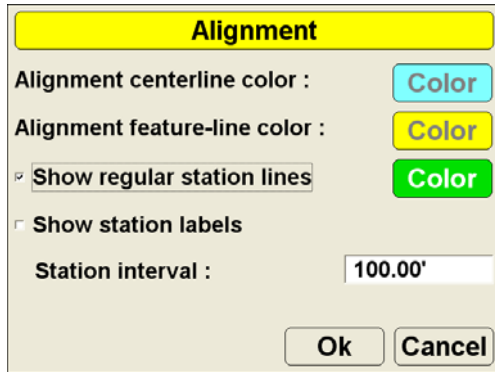


Figure 5-39. Polyline Alignment Options

6. To change to another polyline to steer to, repeat step 4 on page 5-30.
7. To change the alignment file, tap **Topcon Logo** ▶ **File** ▶ **Alignments**. The polyline currently being used is substituted as “Polyline alignment” in the file list, select the new Alignment file you want to use and press **Ok**.

Grading to Polyline

1. Press **Topcon Logo** ▶ **Linework**, select the correct Linework file, and press **Ok**.
2. Press **Topcon Logo** ▶ **View** ▶ **Display options** ▶ **Linework**, select the polylines to display, and press **Show**. See “Linework Display Options” on page 5-20 for more information.
3. Tap the polyline to use for grading and tap **Grade to polyline** on the pop-up menu; graphical cross lines display along the polyline (Figure 5-40 on page 5-32).

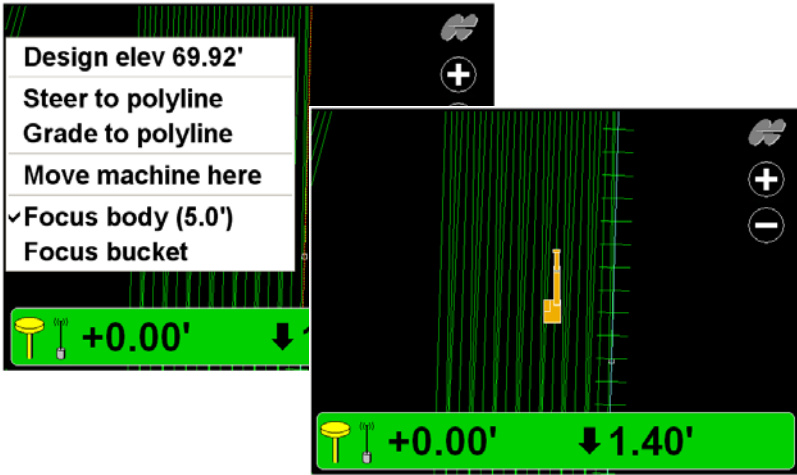


Figure 5-40. Grade To Polyline

Performing Topographic Surveys

3Dxi has the ability to do an “on the fly” topographic survey of the whole project, or any portion thereof. This is helpful when creating as-built to determine the amount of material to move.

1. Tap **Topcon Logo** ▶ **File** ▶ **Point files** to display the *Point files* dialog box. Create a new point file or select an existing Point file. Press **Ok** to return to the Main Screen.
2. Tap **Topcon Logo** ▶ **Tools** ▶ **Topo survey** to display the *Topo survey* dialog box (Figure 5-41 on page 5-33), enter or select the following information, and press **Ok**:
 - Log by – select either minimum distance or time interval:
 - Minimum distance: measures each point at a set distance from the previous logged point.
 - Time interval: measures points at a constant time interval.
 - Minimum distance – available when minimum distance selected; enter the minimum distance by which to log points.

- Time interval (secs) – available when time interval selected; enter the time interval in seconds in which to log points.
- Log to layer – stores measured points to the selected layer.
- Log at – determines the measurement point relative to the cutting edge.
- Lower all elevations by – used when keeping the blade a certain distance above ground to prevent the cutting edge from digging into the surface. Manually measure the height between the ground and the target position on the cutting edge, then tap the entry box to display the numeric pop-up keyboard, enter the measured height value, and press **Ok**. Use a positive value when the cutting edge is above the design surface.

The image shows a software dialog box titled "Topo survey". It contains the following fields and values:

- Log by:** minimum distance
- Minimum distance:** 30.00'
- Log to layer:** GROUND
- Log at:** Left cutting edge
- Lower all elevations by:** 0.00'

At the bottom right of the dialog are two buttons: "Ok" and "Cancel".

Figure 5-41. Topo Survey Options

3. Press **Ok** to start logging measurement data. When the machine begins to move, it will begin measuring and logging the data.
4. To stop topo measurements, press **Topcon Logo ▶ Stop topo survey** (Figure 5-42 on page 5-34). Otherwise, 3Dxi continues logging measurements.



Measurement data will be saved in the Point file currently being used.

5. Copy the point file to a USB device for office analysis.

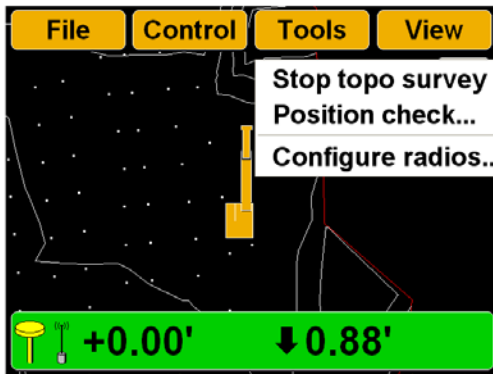


Figure 5-42. Stop Topo Survey

Clearing the MC 2.5 Box NVRAM

The receiver's Non-Volatile Random Access Memory (NVRAM) holds data required for satellite tracking, such as ephemeris¹ data and receiver position. The NVRAM also keeps the current receiver's settings, such as active antenna input, elevation masks and recording interval, and information about the receiver's internal file system.

Even though clearing the NVRAM is not a common (nor normally a recommended) operation, there are times when clearing the NVRAM can eliminate communication or tracking problems. Clearing the NVRAM can be interpreted as a "soft boot" of your computer.

After clearing the NVRAM, your receiver will require some time to collect new ephemerides and almanacs (around 15 minutes). Clearing the NVRAM of the MC-2.5 Box will reset the box to factory default values.

In addition, the NVRAM is used to keep information about the receiver file system. Note that after clearing the NVRAM, the

1. Ephemeris (ephemerides): A table giving the coordinates of a celestial body at a number of specific times during a given period.

receiver's LED(s) will flash orange for a few seconds indicating that the receiver is scanning and checking the file system.

1. Turn off power to the MC-2.5 Box using one of the following:
 - If the MC-2.5 Box is connected to the control box, turn off the control box.
 - Unplug the power cable from the MC-2.5 Box.
2. Simultaneously press and hold the **Main FN** (Figure 5-43) and **AUX FN** keys.
3. Return power to the MC-2.5 Box using one of the following:
 - If the MC-2.5 Box is connected to the control box, turn on the control box.
 - Plug the power cable from the MC-2.5 Box.

The LED corresponding to the pressed FN key turns green.

4. Wait until the Main LED blinks orange (about three seconds).

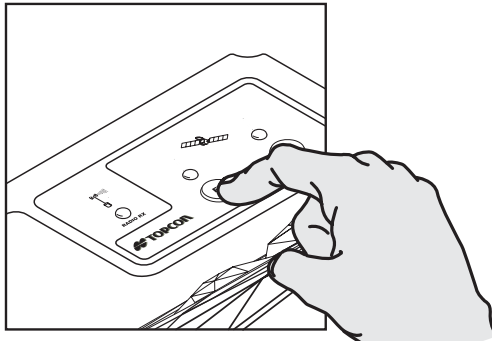


Figure 5-43. Hold FN Key While Turning PWR On to Clear NVRAM

5. Release the FN key while the LED blinks orange.

