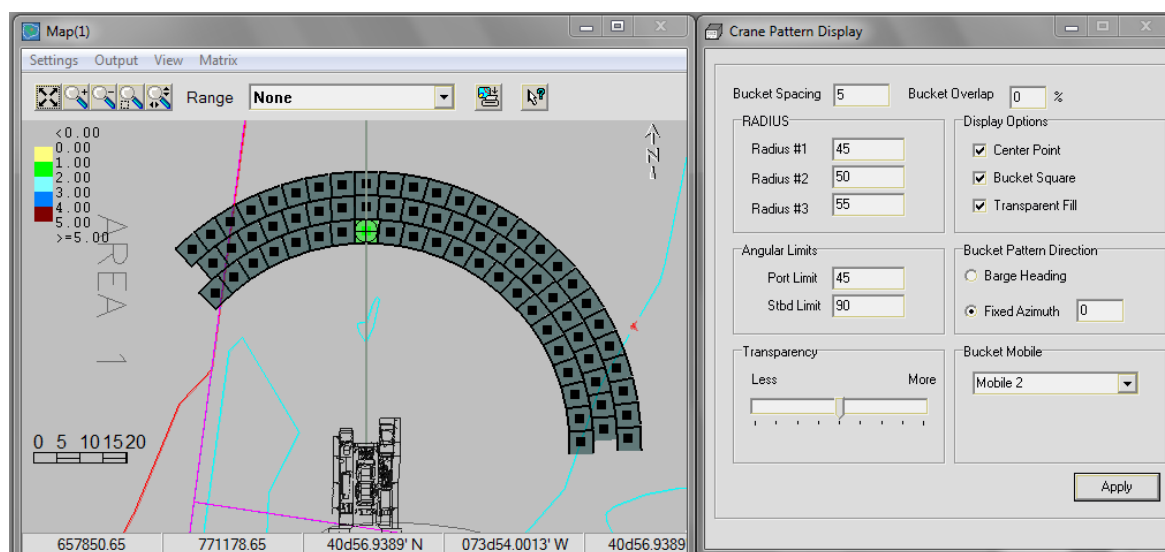




Planned Excavation Pattern

By Jerry Knisley

FIGURE 1. Configuring the CraneDriver.dll in DREDGEPACK®



A driver has been developed to aid in the excavation of material by mechanical means. The driver is named CranePattern.dll and is designed to create a moving series of targets for the operator to excavate. The pattern moves when the machine is moved so that the pattern stays at a relative position to the machine. The machine could be either an excavator or a crane, therefore I will refer to the excavation equipment as the machine in this document.

Figure 1 is a simulation of the system in DREDGEPACK®. The Crane Pattern Display driver is to the right of the standard DREDGEPACK® Map. The crane is located at the bottom of the map. There are three sets of bucket patterns available. They are defined by the three **radius** entries on the driver. Currently the buckets are square, but in the future I will address this and allow for rectangular buckets.

The **Angular Limits** determine the extent that the buckets will be created. These values are entered in degrees from 0 at the center.

The **Bucket Pattern Direction** determines the direction the bucket pattern is created.

- **Barge Heading:** If you use the Barge Heading it is then assumed that the driver is installed on a barge mobile that will not rotate during the excavation.
- **Fixed Azimuth:** If there is only a GPS on the crane cabin and no barge GPS is present, then the fixed azimuth is used to project the bucket pattern in a direction from true north using the current position.

The bucket is the circle cross hair in the center of the green square. Each square is colored a shade of black except the square that is currently occupied by the bucket mobile. The **bucket mobile** is defined in the driver so that the driver knows which position to use to check for cell occupancy. Once the bucket is within the cell it will change to a green color. All of the cells can be made more or less transparent with the **Transparency** slider.

Each of the items drawn to the screen can be disabled by un-checking the box in the **Display Options** group.

Figure 2 shows the pattern driver as it is used after bucket marks were placed during excavation. Because the bucket pattern can be made transparent the matrix below the pattern is not obscured. A series of bucket marks were placed to the south in the image using the pattern as a guide.

FIGURE 2. CranePattern Driver Display Overlays a Bucket Pattern

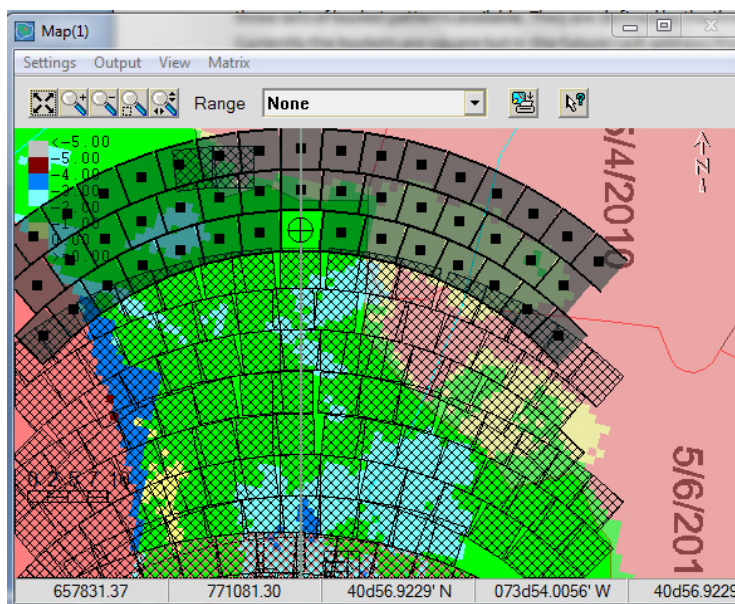


Figure 3 shows the pattern in various states. The top left is the pattern with just the transparent fill, the top right is just the outline and the bottom is with just the center point represented. Any or all of these items can be enabled to fit the users preference.

FIGURE 3. Sample Display Options: Transparent (top left), Outline (top right), Center Point (bottom)

