8. Dredgepack®

I. Overview

DREDGEPACK® enables you to monitor and track digging operations for hopper, cutter, and other dredge types. DREDGEPACK® monitors the position and depth of the cutting tool on the operator's screen in real time and re-maps the bottom based the depth and location of the digging tool. The color-coded depth information is displayed in plan and sectional views to show the "As Surveyed" and the "As Dredged" depths for millions of cells. This enables you to maximize digging efficiency while providing a record of digging operations.

DREDGEPACK® is not meant for hydrographic surveying. It is a stand-alone product and the only requirement is to feed it with an XYZ file for the dredging area. To produce such a file you need other tools to produce a hydrographic survey. HYPACK® MAX is preferred, but you can use any other survey package. For general operating information, please review the SURVEY chapter.

II. Running DREDGEPACK®

The following outlines a typical DREDGEPACK® task sequence.

1. **Create a new Project** in the HYPACK® MAX shell.
2. **Conduct a pre-dredge survey** of your project area to get an XYZ data file. Add the XYZ data file to the SORT directory of your Project.
3. **Create a Matrix file** from your XYZ data. The XYZTOMTX program, is easiest.
4. **Create a Planned Line (optional)**. Use CHANNEL DESIGN if you have information on your channel geometry.
5. **Launch DREDGEPACK®** by clicking the DREDGEPACK® icon or selecting SURVEY-DREDGEPACK.
6. **Set the Matrix File Options** by selecting MATRIX-OPTIONS menu item. Specify whether you want to update the matrix only when On-Line or Always.
7. **Use your Matrix to guide you as you dredge**. You can paint new data as you dredge and compare it to the pre-dredge depths.
8. **Save your data.** You can save the filled matrix (FILE-SAVE MTX) or only the sounding data in XYZ format (FILE-SAVE AS XYZ).

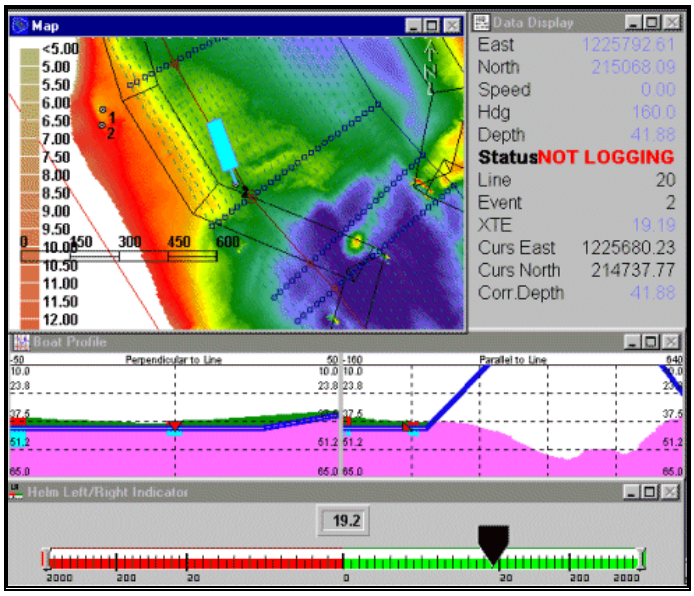
DREDGEPACK® should automatically save the matrix when you exit the program, but just to be sure, it's a good idea to save your data manually at the end of each day.

If you are using a bucket dredge, you can use a bucket pattern display instead of, or together with, a matrix display to track the dredge depths. In capping operations, the bucket pattern display can be used to track how many buckets of soil have been placed in each location.

III. Windows in Dredgepack®

The DREDGEPACK® screen is very similar to the SURVEY screen. The major difference is the addition of the Cut Profile window that shows the "As Surveyed" and "As Dredged " profiles for a section through the cutting tool.

Dredgepack screen



A. Area Map Window in DREDGEPACK®

The Area Map window is a plan view of your survey area. It displays any planned lines background files, matrix files along with the position of the dredge vessel and its track line. A matrix file is used to display the color-coded depth information.

We suggest that you set your Matrix Options (see "Matrix Options in DREDGEPACK®") to record Maximum Depth values when you are working in Depth Mode, (Minimum Depth when you are in Elevation Mode) and select MATRIX-SHOW DREDGED DATA. With these settings, as the cutting tool passes over each cell, it determines what cell the cutting tool is positioned over. If the depth of the cutting tool is deeper than the previous "As Dredged" depth or the "As Surveyed" depth for the cell, it then saves the depth of the cutting tool to the "As Dredged" data set. The screen displays either the "As Surveyed" depth (if it is greater than the "As Dredged depth) or the "As Dredged" depth (if it is greater than the "As Surveyed" depth. This provides the operator with a useful graphic to determine areas that

remain to be dredged to achieve the project depth.

You may choose instead to view the difference between the "As Surveyed" depths and the "As Dredged" depths.

B. Data Display Window in DREDGEPACK®

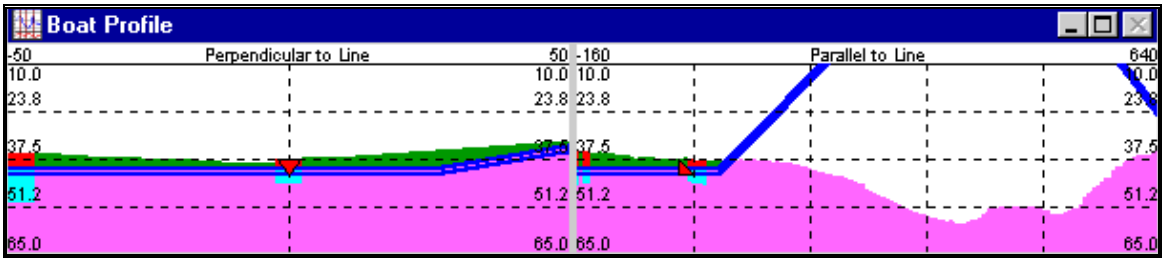
The Data Display window is identical to the one described in the SURVEY program. Please refer to the SURVEY chapter for details on this window.

C. Left-Right Indicator in DREDGEPACK®

The left-right indicator shows the distance of your vessel left and right from a planned line. Many operators opt not to use a planned line file. In this case, the Left-Right indicator will not be available. Other operators prefer to have a single line, representing the channel centerline in their planned line file. The distance offline then represents the "offset" and the distance along line represents the "chainage". These two items (offset and chainage) are also available in the data display. Operation of the left-right indicator is identical to the one in the SURVEY program. Please refer to the SURVEY chapter for details.

D. Boat Profile Window in DREDGEPACK®

The Boat Profile window provides a cross section display through the cutting tool, based on the current orientation of the vessel. It shows the "As Surveyed" and "As Dredged" profiles for a section through the cutting tool.



1) Channel Profile Settings in DREDGEPACK®

The cross section profile in the Profile window can be drawn from:

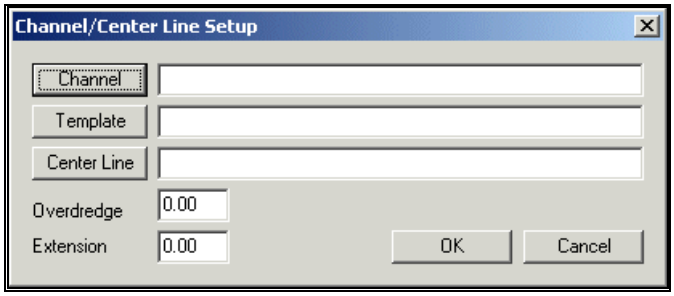
- **A 3-dimensional Line file** .(*.LNW) usually created in CHANNEL DESIGN.
- **An Advanced Channel file** (*.CHN) from ADVANCED CHANNEL DESIGN.
- **A combination of a 2-dimensional centerline created in the LINE EDITOR and a template (*.TPL or *.TMP) usually created in CROSS SECTIONS AND VOLUMES**. In this case, the Line file should have only one line representing the centerline of the channel. It can be a multi-segmented line. Create the Template file referencing the distances to the centerline; negative values are left of the center line and positive values are right. Negative depths will be recognized as points above chart datum. The program will automatically enter the correct

depths and widths according to the template information. The resulting channel will also be displayed in the Map Window

To load these features:

1. **Select CHARTS-CHANNEL** and the Channel/Center Line Setup dialog will appear.

The Channel/Center Line Dialog

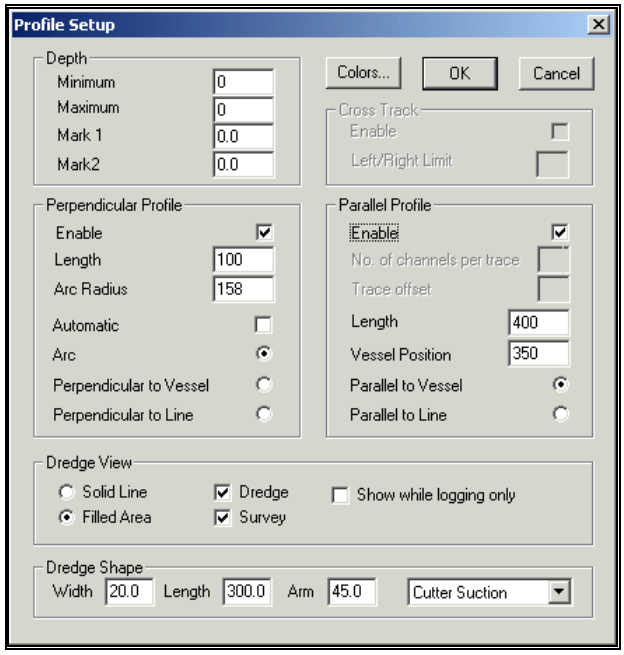


2. **Click the button that corresponds to the file type** you want to add and choose the file through the File Select dialog.
3. **Add any Overdredge or Extensions**.
   - **Overdredge** draws a line a user-defined distance outside of the template, parallel to the side slopes and bottom**.**
   - **Extensions** lengthen the features outward from the top of the bank by this amount.
4. **Click [OK]**.

To configure the Profile Window:

1. **Place the focus on a Profile Window** by clicking on it. "VesselName Profile" will now appear in the menu.
2. **Select VesselName PROFILE–SETUP**. The Profile Setup Window will appear. The Depth options and Parallel Profile options affect the depth portion of the window while the Cross Track portion affects the track line portion of the window. The Perpendicular Profile and Dredge Setting options will be disabled as they are only available in DREDGEPACK.

Boat Profile Setup Dialog

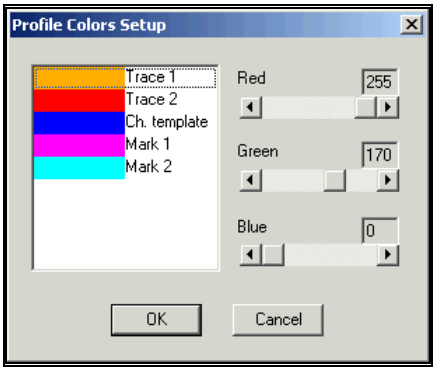


Min Depth and **Max Depth** set the vertical range of the graph display.

Mark 1 and **Mark 2** draw horizontal lines across the graph display at the specified depths.

[Colors] enables you to set unique colors for each of the above features. Select a feature on the left then use the color controls to adjust the color. Click [OK] to return to the Boat Profile Setup dialog.

Setting the Profile Colors in Dredgepack



To define the contents of the Boat Profile window:

Check "Enable" under Perpendicular Profile, Parallel Profile or both, and select the required view. (If neither is enabled, the Boat Profile window will be blank.)

The **Perpendicular Profile** displays a profile at the cutter head of:

- A straight line cut perpendicular to the vessel.
- A straight line cut perpendicular to the survey line.
- An arc of user-defined length and Arc Radius centered on the cutter head origin.

- **Length** sets the length of the Arc and also the length of the profile graph; both are in survey units. The origin of the vessel will be centered in the profile.
- The **Arc Radius** should be the distance from the spud to the cutter head. Auto automatically computes Arc Radius from digital feed.

Parallel Profile displays a profile parallel to either the vessel or the survey line, and of a user-defined length. If you choose Parallel to Vessel, 80% of the length is drawn 'in front' of the vessel and 20% of the length is drawn behind the vessel.

- **Length** determines the length of the profile displayed at any one time.
- **Vessel Position** sets the position of the digging tool within the profile length. For example: If the Length is set to 500, a Vessel Position of 250 will position the digging tool in the center.

Dredge View and **Dredge Shape** settings are additional settings exclusively for DREDGEPACK®.

Dredge View options effect the display of channel and depth information.

- **Solid Line** and **Filled Area** determine how the bottom profile is displayed.
- **Dredge** and **Survey** display dredging and pre-dredge depths respectively.
- **Show while logging only** will display depth information only when you are collecting data. This feature can be a handy reminder to start logging.

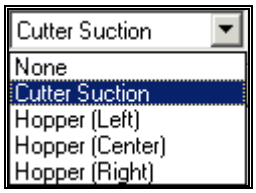
Dredge Shape options describe the length and width of the dredge and the length of the dredge arm. (See the next section.)

2) Displaying the Vessel in the Profile Window of DREDGEPACK®

The **Dredge Shape** settings in the Profile Setup dialog enable you to include an approximate representation of your dredge in your Profile Window. You can use the dredge shapes created by HYPACK, Inc. or create new ones that look a little more like your dredge. (See the following section for the details.)

In either case, you will need to enter the dimensions of the dredge and the length of the arm (measured in survey units) then select the type of dredge that you are using. (A setting of None displays only the cutter head location.)

Dredge Type Selection List



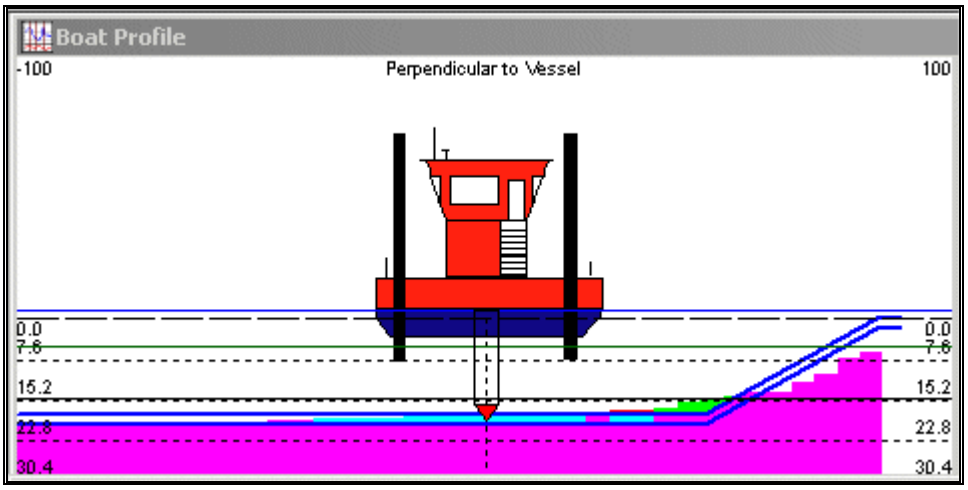
The Profile Window will display a figure approximating your dredge according to these settings.

Note: If the scale or the arm angle (or both) looks a little peculiar, check the scaling of the Profile Window. The horizontal and vertical scales are independent of each other and can skew the display of the vessel.

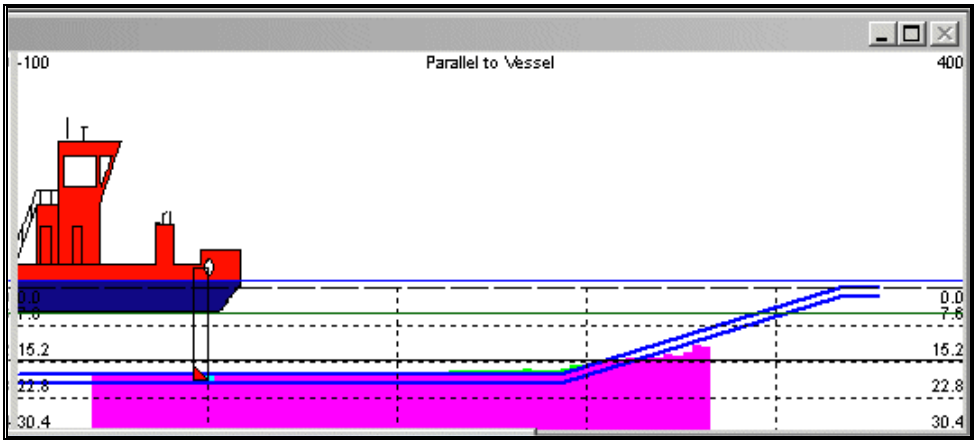
When a Dredge Shape is loaded, DREDGEPACK® will also display a blue waterline which will be positioned in your window according to the current tide correction values. As the tide rises and falls, your vessel is positioned accordingly.

The vertical position of the boat is also affected by its draft. The "Level" measurement must be corrected in the initialization file to more accurately display your dredge relative to the waterline. The vertical position of the Dredge Shape will change relative to the waterline as the draft changes.

Boat Profile – Perpendicular View



Boat Profile – Parallel View



3) Customizing your Dredge Display

You can customize your dredge display for your dredge by:

Creating your own dredge shapes that look more like your vessel side and end views.

Editing the *.ini files for your Dredge Shape type.

(a) Creating a Custom Dredge Shape

DREDGEPACK® requires bitmaps of the starboard and end view of your vessel. You can:

Import photos, saved in BMP format. In this case, we suggest that you replace the background with white space.

Use a graphics program to create a scale drawing of your dredge's starboard side view and rear view and save them as *.BMP files.

(b) Editing the Dredge Type Initialization File

Each Dredge Shape type has two *.INI files, one for the parallel to vessel view and one for the perpendicular to vessel view. They tell DREDGEPACK® about the *.BMP file and how to position it in your Profile Window and are stored in the \Hypack\Shapes directory.

Dredge Shape Type	Profile View	INI File
Cutter Suction	Perpendicular to Vessel	Cuttercross.ini
Cutter Suction	Parallel to Vessel	Cutterprof.ini
Hopper (Center)	Perpendicular to Vessel	HopperCrossC.ini
Hopper (Center)	Parallel to Vessel	HopperProfC.ini
Hopper (Right)	Perpendicular to Vessel	HopperCrossR.ini
Hopper (Right)	Parallel to Vessel	HopperProfR.ini
Hopper (Left)	Perpendicular to Vessel	HopperCrossL.ini
Hopper (Left)	Parallel to Vessel	HopperProfL.ini

Use a word processing program to edit the initialization files that correspond to your Dredge Shape Type. The following is a sample file.

```
[General]
Level=85
ArmX=336
ArmY=78
BMPFILE=c:\hypack\shapes\cutterprof.bmp
```

Each graphic is measured in pixels using an X,Y coordinate system where 0,0 is the upper left corner. Level, ArmX and ArmY are all based on this system. It is not the same as your hardware offset measurements.

Level is the BMP Y coordinate corresponding to the water level when the draft is 0.

ArmX and **ArmY** describe where the drag arm is attached to the vessel.

BMPFile names the file, including the path, of the graphic file. You would use the side view graphic for Profile Views that are parallel to your vessel and the end view graphic for the perpendicular to vessel Profile View.

E. Device Windows in DREDGEPACK®

Each device you have selected in the HARDWARE program will generate it's own window with a scrolling display of the device input set by the device driver. This means that the information for different devices will vary.

F. Alarms in DREDGEPACK®

Alarm windows are located along the bottom of the DREDGEPACK® screen. When the criteria are met, the alarm window turns red and the Windows® Exclamation alarm sounds. You can acknowledge the alarm by pressing the Escape key. This turns the alarm yellow. The alarm will remain on the screen until the alarm state is resolved.

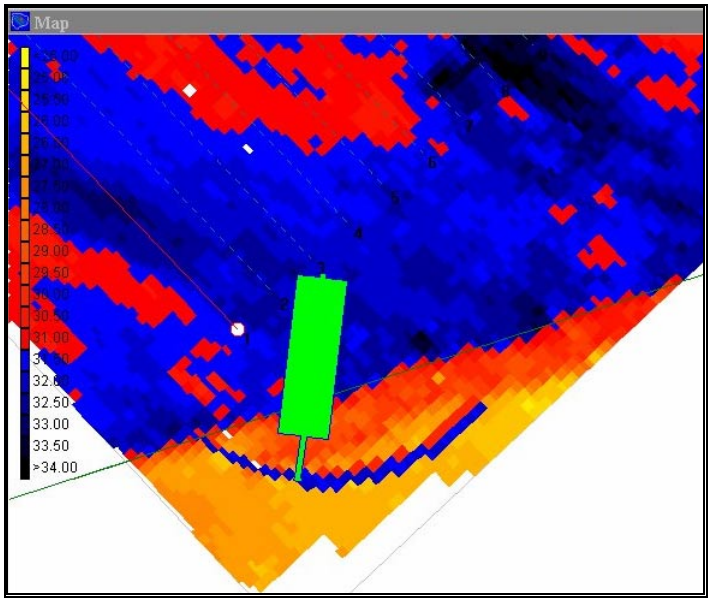
The DREDGEPACK®program can generate the following alarms.

Cross Track Error Alarm:	Generated when the boat position is outside the limit set in the Navigation Parameters dialog or the Left-Right Indicator.
Device Alarm:	Generated when a device has not reported an update within the last 5 seconds.
HDOP Alarm:	Generated when the HDOP from a GPS drops below a level defined in the GPS device setup dialog.
No Diff Alarm:	Generated when a GPS drops from Differential to stand-alone mode and this option is checked in the GPS Device Setup dialog.
No Kinematic Alarm:	Generated when an RTK GPS drops from Kinematic to Differential and this option is checked in the GPS Device Setup dialog.
Min Depth:	Generated when the measured depth drops below a value defined in the Navigation Parameters dialog.

IV. Matrix Files in DREDGEPACK®

A Matrix File (*.MTX) is a rectangular area which is composed of thousands (or millions) of individual matrix cells. The DREDGEPACK® program can "repaint" the matrix with depth information from your cutting tool.

A Matrix File in the Map Window of Dredgepack



If a Matrix File (*.MTX) has been specified in the HYPACK® MAX project screen, it will be automatically loaded into the DREDGEPACK® program. You can also "Load" and "Unload" matrix files in real time from the Matrix menu of the DREDGEPACK® program.

Note: Users should be aware that there are limits as to the maximum size of a matrix that can be successfully used in DREDGEPACK®. The maximum size depends on the amount of RAM, free hard drive space and processing power on your computer. Users with very large matrices should refer to the creation of Matrix Log files in the HYPACK® MAX manual.

A. Entering Survey Data into a Matrix File

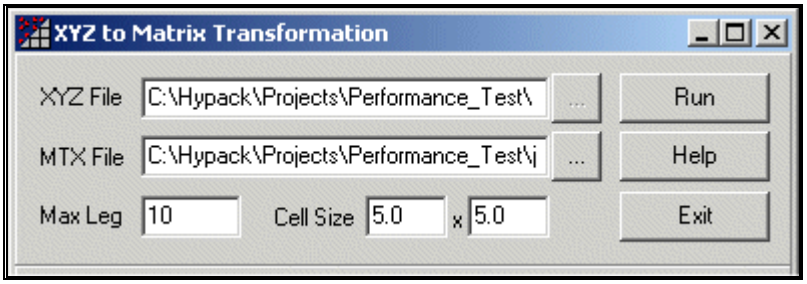
One of the first steps before beginning the digging operation is to transfer your pre-dredge survey data into a matrix. This allows you to display the color-coded depth information while digging, changing the colors based on the depth of the digging tool as it passes through each cell.

1) Creating a MTX file in XYZ TO MTX

XYZ TO MTX and TIN MODEL are the most useful methods as they interpolate data to cover areas where your data is sparse or non-existent. They can therefore create a fully filled, yet quite accurate HYPACK-type matrix file to guide your dredge project. XYZ TO MTX is easier for simply filling matrix files and creates the same results.

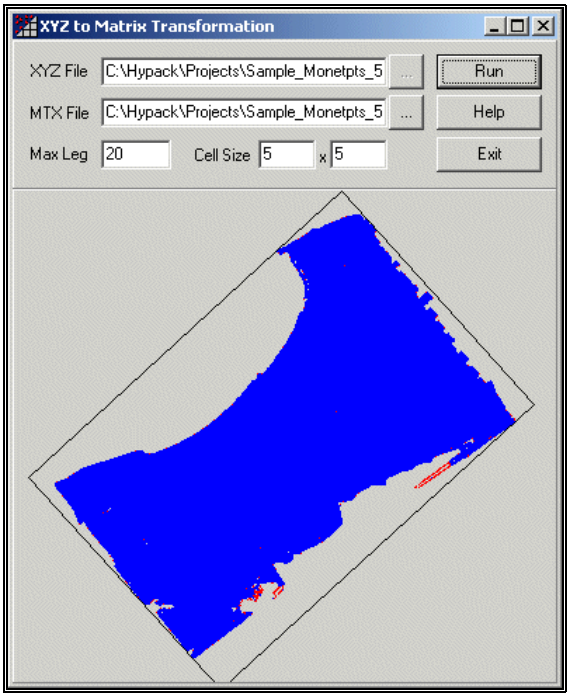
1. **Start the XYZ TO MTX program** by either clicking on the icon or clicking the UTILITIES-OTHER-XYZ TO MTX menu item.

XYZ to Matrix Dialog



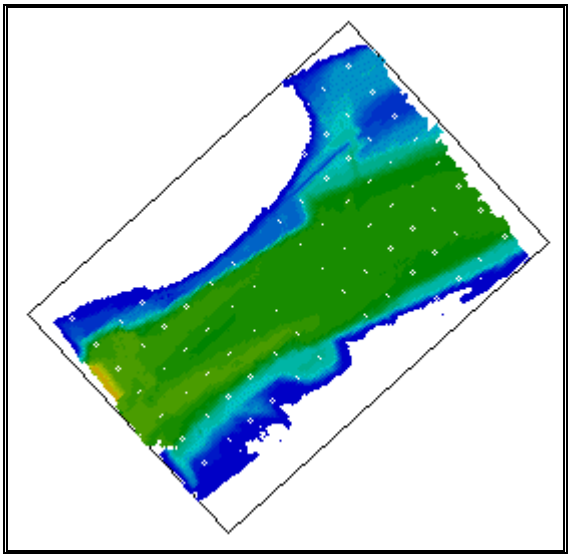
2. **Fill in all of the fields**.
   - Enter the **XYZ file** you wish to convert. ([Browse] makes it a snap!)
   - **MTX file:** Enter the path and name for your new Matrix file. This should be stored in the root directory of your Project.
   - **Max Leg** specifies the maximum distance used to connect to XYZ data points. This value must be greater than 0. Start with about 150% of your line spacing. (You need a value large enough so your data points connect, but not so large that points which have little relationship connect to each other.) The value of this field depends on the density of the input data. If the value is too small, the final result will be incomplete. If the value is too large, the creation will be slow.
   - **Cell Size** fields define the cell size within the Matrix to be created. It is expressed in survey units.
3. **Click [Run].** The program generates a surface model and then calculates the Matrix size and rotation to fit the data. It then fills the matrix cells with the depth nearest the center of each cell calculated from the surface model.

A Sample XYZ to MTX Conversion



4. **Click [Exit].** The new matrix should now appear on the screen in the HYPACK® MAX shell.

A Sample Matrix created in the XYZ to MTX program



2) Filling a Matrix in TIN Model

Filling a matrix through the TIN Model program is a little more involved than through XYZ TO MTX, but the results are the same. The steps are as follows:

1. **Create an empty HYPACK® matrix** (*.MTX) File in HYPACK® MAX.
2. **Create a surface model of your survey data in the TIN MODEL program**. It can accept edited or sorted HYPACK® files or ASCII XYZ files from other sources.
3. **Export your data in a filled matrix** from the TIN Model program.

The filled matrix file (once enabled) can be displayed in the HYPACK® MAX design screen and will be imported automatically into SURVEY or DREDGEPACK®.

3) Filling a Matrix in Multibeam Max

This method is appropriate if your pre-dredge survey data is done with a multibeam system and provides complete coverage.

In MULTIBEAM MAX you can:

- **Edit raw multibeam data** (HSX format) with MULTIBEAM MAX, then save it to a matrix.
- **Load edited multibeam data** (*.SWP or *.HS2 format) or XYZ format files to MULTIBEAM MAX, pass over the editing phases and save the data to a matrix.
- **Create a matrix file to fit your selected data**. In the Matrix Options, select Auto-Size to Data. You can set the cell dimensions or let MULTIBEAM MAX set the size**. Auto Cell Size** automatically calculates cell size to average 25-50 points per cell.

B. Loading and Unloading a Matrix Files in DREDGEPACK®

To load a matrix file in real time, select MATRIX-LOAD and select the matrix file from the file selection dialog. If you have loaded a "filled" matrix and wish to remove the sounding data, select MATRIX-CLEAR CURRENT DATA. You will be given the option to save the sounding data to XYZ format and the soundings will be erased from the Area Map.

To unload a Matrix File, select MATRIX-UNLOAD.

C. Multiple Matrix Files in DREDGEPACK®

In certain projects for hopper dredges, it may be advantageous to have a series of smaller matrix files, rather than one huge matrix file. It is more efficient for the program to concentrate on one small matrix file at a time, and automatically “swap” from one to another, than to manage and re-draw one that is hundreds of megabytes large.

The DREDGEPACK® program will load all of the matrices enabled in your project. It will display and update any matrix while the dredge vessel falls within its boundary. As it moves through the project, the program will continue to load and un-load the individual matrix files, depending on its location.

Note that only one matrix can display data at a time while you are logging data. In the case where matrices overlap, the matrix whose center is closest to the boat position will be viewable. All matrices may be displayed simultaneously (complete with sounding data) only when you are off line by selecting MATRIX-DISPLAY ALL MATRICES.

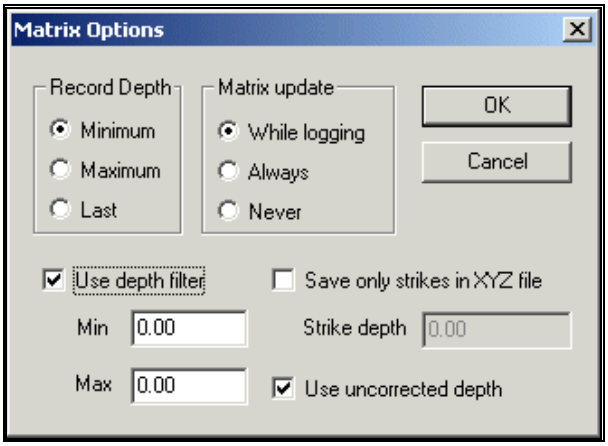
D. Saving Dredge Depths to the Matrix in DREDGEPACK®

1) Matrix Options in DREDGEPACK®

The DREDGEPACK® program automatically records HYPACK® Raw format data files and repaints the matrix cells, according to the criteria set in the Matrix Options. The Raw format files contain the time, boat origin position, location of the cutting tool and the depth of the cutting tool at user-defined intervals. Matrix files can be saved at even time intervals by setting a Matrix Backup time in the Navigation parameters.

In DREDGEPACK®, the soundings you record will be saved to the Matrix according to the criteria set in the Matrix Options. Select MATRIX-OPTIONS and the Matrix Options dialog will appear.

Matrix Options Dialog



Record Depth determines the depth reading to be stored to each Matrix Cell. Note how they are affected by Elevation or Depth Mode that you have set in the Matrix Menu.

Minimum will record the smallest depth value received in that cell.

- **In Depth Mode**, , the smallest value is at the shoalest point.
- **In Elevation Mode**, the smallest value is at the deepest point.

Maximum will record the largest depth value received in that cell.

- **In Depth Mode**, the largest depth is deepest, while the smallest depth is shoalest.
- **In Elevation Mode**, the largest depth is shoalest, while the smallest depth is deepest.

Last will record the last sounding received.

Use Depth Filter option can be used to eliminate depths outside a user-defined range (Min Depth to Max Depth) from being saved to the matrix. This function can be used in either Depth or Elevation Mode. Since soundings are output as positive values, the Min. and Max values are always positive and the depths saved will fall in that range.

Save only strikes in XYZ file determines what is saved when you select MATRIX-Save to XYZ.

- **If selected**, this option saves the difference between the sounding value and the strike depth only where the soundings are greater than the user-defined strike depth. If the sounding is deeper than the strike depth, no value is saved at that cell. This is useful to see how much must be dredged to level the area to the strike depth.
- **If unselected**, this option saves all depths.

Beware!

This function is influenced by the Elevation Mode setting. If you are in Elevation Mode, this will record depths deeper than the strike mode. Probably not a very useful set of data!

You may also choose a Matrix Update Basis. You can choose to update your Matrix as follows:

- **Always** updates your Matrix continuously. This option enables you to follow your dredging in the Matrix while not recording the Raw data if you don't need it.
- **While Logging** updates your Matrix only when you are logging Raw data.
- **Never** causes the program not to update the Matix with "As Dredged" depths.

The Matrix is updated, by default, with corrected depth information. You may record the uncorrected depth by checking Use Uncorrected Depths.

2) Showing the Original Data in the Survey Matrix

You can compare survey data of the same area from an earlier survey by loading a matrix containing the earlier sounding data. As you dredge, the "As Dredged" data will be saved to the matrix. You can toggle between displays of "As Surveyed" depths and "As Dredged" values by selecting MATRIX-SHOW ORIGINAL DATA ("As Surveyed" view) and MATRIX-SHOW DREDGE DATA ("As Dredged").

3) Showing the Differences in the Matrix

DREDGEPACK® will compute the difference between the dredged depths and the pre-dredge survey depths and display the difference. To do this select MATRIX-SHOW DIFFERENCES.

- **In depth mode**, the display will be represent the dredge depth minus the survey depth.
- **In elevation mode**, the display will represent the survey depth minus the dredge depth.

E. Editing Matrix Depths in DREDGEPACK®

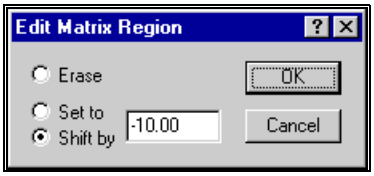
The Matrix menu has a group of selections that, together, enable you to use a Border File to modify the soundings in your matrix inside or outside its boundaries.

1. **Create a Border File** describing the area you wish to edit. You can:
   - Create it in the BORDER EDITOR and load it into DREDGPACK by selecting MATRIX-LOAD BORDER.
   - Create it in DREDGEPACK:
   - Select MATRIX-CREATE BORDER. Click as many points as you need to outline your area then right click either inside or outside of the border you have created according to which portion of your data you want to modify. The polygon will automatically connect the first and last left clicked points.
2. **Save your Border file** by selecting MATRIX-SAVE BORDER and providing a name. The file will be saved to your project directory with the *.BRD extension.
3. **Modify your data** by selecting MATRIX-EDIT BORDER. The Edit Matrix Region dialog will appear. For all soundings inside or outside the

border (depending on where you right clicked when you created the border) you can:

- Delete them by selecting Erase.
- Set them all to the same depth by selecting Set To and entering the depth you want.
- Increase or decrease all of the depth values by a constant number by selecting Shift By and entering the amount (positive or negative) by which you want to adjust your depths.

Edit Matrix Dialog

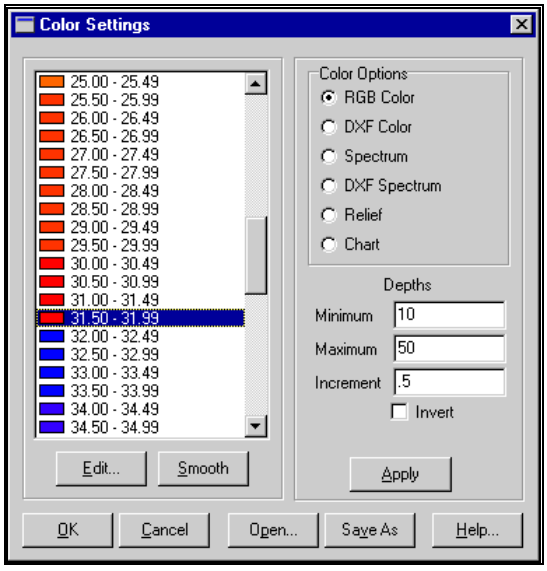


4. **Click [OK].** The dialog will disappear and the modification will be made and drawn to the screen.
5. **Remove the border file from your display (optional**) by selecting MATRIX-REMOVE BORDER.

F. Matrix Color Settings in DREDGEPACK®

The colors of the cells used to display the matrix information are inherited from the HYPACK® MAX Color Settings. Once you are running the DREDGEPACK® program, you can make changes to the color assignments by right clicking on the matrix legend, located on the left-hand side of the Map window. The Matrix Colors Setup window will appear.

Matrix Colors Dialog



In the example, we have a project design depth of 31.50. We have set the color for material that must be removed (less than 31.50) as red-orange. We have set the color of material where the depth is deeper than the design as blue. This provides the operator with a clear graphic that displays where they should be digging and where they do not have to dig.

The number of color zones can be determined from the following formula.

No. of zones = [(MaxDepth – MinDepth) / ZoneIncrement] + 2

For example, we want to display depths from 25.0 (MinDepth) to 40.0 (MaxDepth) with a zone every 0.5' (ZoneIncrement). Plugging these into the formula gives:

No. of zones = [(40.0 – 25.0) / 0.5] + 2 = 32 zones.

G. Saving Matrix Files in DREDGEPACK®

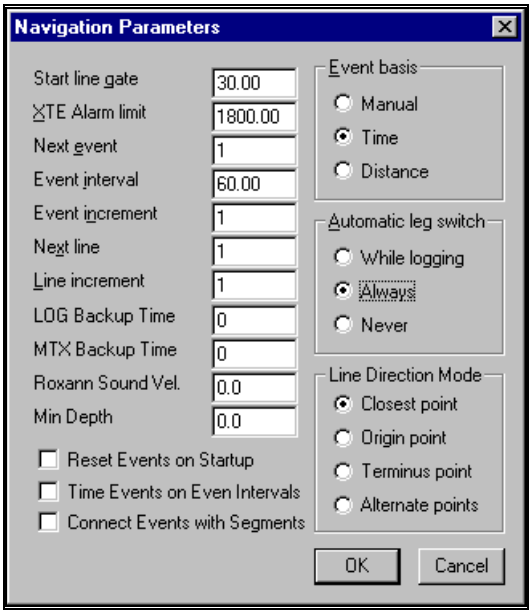
You can save your Matrix data at any time during your survey. You can do this

- **Manually**:
  - Select MATRIX-SAVE MATRIX to save the Matrix file in its current state.
  - Select MATRIX-SAVE TO XYZ to the current data in XYZ format. In this case, the data will be saved according to the choices in the Matrix Options dialog.
- **Automatically at regular intervals:**

This option provides you with a near-current copy of the MTX file that is pretty useful, should you have a power failure.

Select OPTIONS–NAVIGATION PARAMETERS and the Navigation Parameters dialog will appear. The number of minutes in **MTX Backup Time** represents the frequency that the program automatically backs up the MTX file. If the value is 0, the program will not automatically create a backup file

Navigation Parameters Window

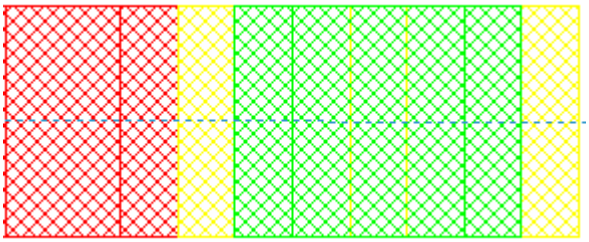


A value of 10 to 15 is recommended.

V. Bucket Patterns in DREDGEPACK®

If you are using a bucket dredge, you can display bucket patterns. This option can be helpful in tracking your coverage and in achieving optimal bucket placement.

Sample Bucket Patterns



There are two distinct uses for bucket dredges:

- **Dredging** to remove material. Click F3 each time your bucket reaches the bottom and your project depth colors will be used to color-code bucket foot-prints according to the depth and orientation of your bucket.
- **Capping** puts material down. Click F3 each time you drop material to track the number of drops at each position.

In both applications, the location of the previous bucket gives you a visual reference with which to control the next placement.

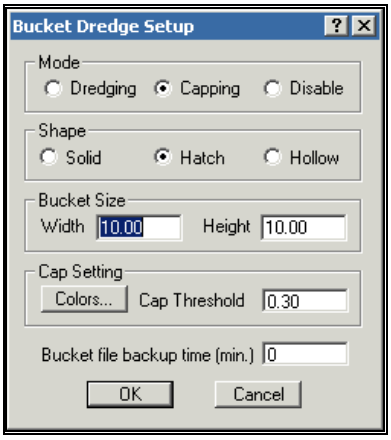
A Bucket file (*.BKT) is automatically created in your project each day you work with bucket patterns. By default, bucket files are named *Date*.BKT All of the bucket footprints created in any one day are saved to the day's file. It can be displayed in the area map of DREDGEPACK® and in HYPACK® MAX. They can be automatically saved at even time intervals by setting a bucket file backup time in the Bucket Setup Dialog.

A. Displaying Bucket Patterns in DREDGEPACK®

When you launch DREDGEPACK®, all bucket files that are enabled in HYPACK® MAX will be loaded as a background chart. The display of each file can be turned on and off through the map menu.

Before you begin to log data, you must set your Bucket Options. Select OPTIONS-BUCKET PARAMETERS to access the Bucket Dredge Setup dialog.

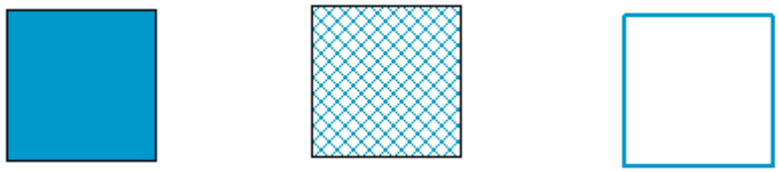
Bucket Dredge Setup Dialog



Mode tells DREDGEPACK® whether you are dredging or capping. The *Disable* option suspends this display.

Shape describes the fill pattern of the footprints displayed on the screen.

Bucket Display Options



Solid *Hatch* *Hollow*

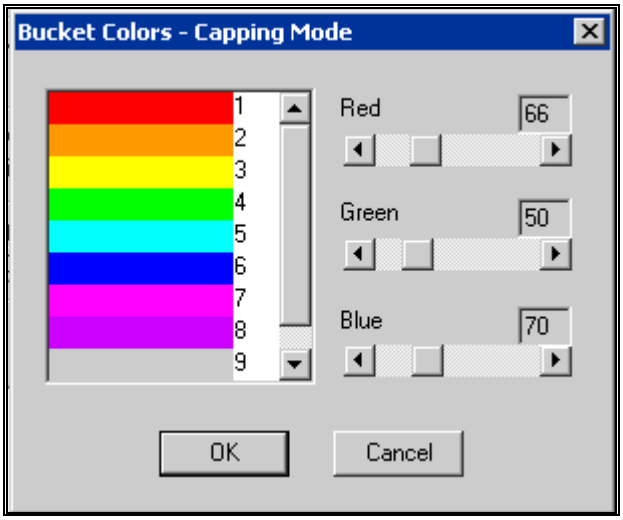
Bucket Size determines the dimensions of the footprint displayed.

Cap Setting: In Capping mode, DREDGEPACK® tracks the number of drops at each location so you know you have achieved even coverage of an area. If you know the *approximate* change in depth for each drop, you can also *estimate* how much you have added to any location.

It is also used in Capping mode to determine which color footprint to draw. The footprint colors at each location will be incremented with each drop according to the colors in the Bucket Colors dialog and the user-specified Cap Threshold.

[Colors] accesses the Bucket Colors dialog. Select each color on the left and customize your color scheme using the sliders on the right.

Bucket Colors Dialog



The **Cap Threshold** defines the amount one bucket footprint must overlap another before DREDGEPACK® will increment the color. Currently, it is not based on the footprint *area*, but on the distance between the footprint center points.

An example will help to illustrate how this all works. We will use the settings as displayed in the Bucket Setup dialog above (bucket size = 10 x 10 and Cap Threshold = 0.7). The color will increment if the bucket center is more than 3 units (1-0.7=0.3 which is 30%) offset from the center of all previous bucket footprints in that area.

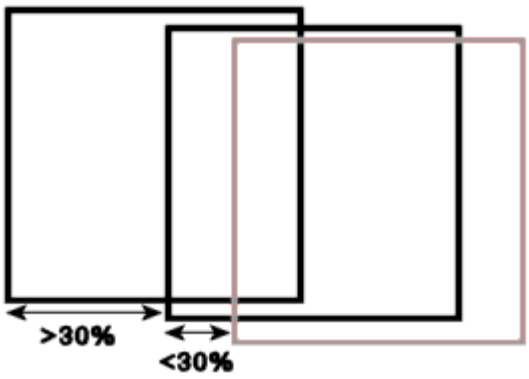
The first bucket dropped at any position will display a Color 1 footprint. After that, as long as the position of the bucket center for each drop is greater than 3 units (approximately 70% overlap of the bucket as indicated by the Bucket Threshold) away from any other, each of those footprints will also be Color 1. If any subsequent bucket is dropped *less than* the threshold distance of the bucket width away, the footprint will be Color 2. A third drop within a half-bucket width of the same location will draw in Color 3.

From left to right:

-The first bucket is color1.

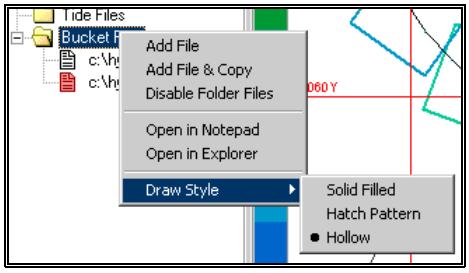
-The second bucket is more than 30% offset so it is still color 1.

-The third bucket is offset less than 30% from the second, so it is color2.



B. Displaying Bucket Patterns in HYPACK® MAX

Bucket files are listed in the Project Files list in the HYPACK® MAX screen. Enable or disable them, as any other file type, to



control whether they are drawn to the map area.

Note: While most files enabled in HYPACK® MAX are loaded and displayed in DREDGEPACK®, Bucket files may only be drawn to the DREDGEPACK® screen according to the Bucket History and Bucket Today options in the DREDGEPACK® Map menu.

You can also choose the design of the footprint by right clicking "Bucket Files" and selecting "Draw Style". You have the same options (solid, hatch pattern or hollow) as in DREDGEPACK®.

VI. Volume Estimates in DREDGEPACK®

A real-time volume estimate that calculates the difference between the "As Dredged" and "As Surveyed" surfaces is available by selecting Data DISPLAY–CONFIGURATION-VOLUME. You must realize that this is only an estimated value. A detailed hydrographic survey with precise depth measurements must be performed to calculate the true amount of material that has been removed.