

## **Table of Contents**

INTRODUCTION .....	2
PROGRAM DESCRIPTION and REQUIREMENTS .....	3
WinSURV II START UP SCREEN.....	4
ADDING A NEW JOB.....	5
CREATING a JOB TOOL INVENTORY .....	6
VIEWING and PRINTING REPORTS (START-UP SCREEN) .....	7
“COPY & PASTE” TOOL LISTS and BHA’s.....	8
FILE OPTIONS.....	8
VIEW and EDIT BASIC JOB DATA.....	9
<b>Deleting Jobs And Bottom Hole Assemblies.....</b>	<b>10</b>
“MULTI-LINGUAL” LOCALIZATION.....	11
CREATING CUSTOM LOOK-UP TABLES .....	12
MAIN DATA ENTRY – The ‘Folders’ .....	18
JOB MEASUREMENT UNITS.....	21
TOOL LIST .....	22
BOTTOM HOLE ASSEMBLY INFORMATION.....	25
ENTERING BHA ITEMS.....	27
HYDRAULICS .....	31
THE DAILY REPORT .....	35
DAILY COST ENTRY .....	37
DAILY ITEMS .....	39
REPORTS .....	42
<b>Post Well Reporting.....</b>	<b>44</b>

## INTRODUCTION

With the ever increasing complexity and expense of drilling modern directional wells, the need for comprehensive and professional-grade reporting and documentation of the drilling process has become progressively more important. The ideal is to maintain a database built up of all jobs that have been run, that is easily accessible to the average user, and that allows independent development of queries and reports. The necessary information gathered should not increase the information load on the directional driller; rather, the program itself should help to alleviate the information burden to the user, and enhance the on site, and post well reporting process by creating clear, concise reports. The generation of post well reports should be accomplished in a matter of minutes as opposed to days, thus providing the customer a timely, and accurate report. In addition, the historical information archived in the database may be used to support sales strategies and help generate proposals for new jobs.

Of all the programs a directional driller uses on location, the daily report probably consumes most of his time. The most common form for a daily report generated on a computer is based upon a spreadsheet. Although spreadsheets are fine as input devices since they present a WYSIWYG interface and data entry is intuitive, they are clumsy from the standpoint of gathering repetitive data in a user friendly, useful format. A copy of the spreadsheet has to be maintained for each day, making cataloging difficult and prone to lost files. It is not easy to quickly navigate from one day to another; neither is it a simple task to summarize data from a single job, never mind from a multitude of jobs.

WinSURV II performs all of these tasks to produce the finest field and post well reporting package in the directional industry, and has become, over the last seven years, a proven standard utilized by hundreds of people. This premium reporting also saves time. No longer must directional drillers maintain separate spreadsheets for each daily report or BHA. Office coordinators can quickly generate post well reports at the click of a button, eliminating the tedious work of assembling information from multiple sources.

WinSURV II provides a complete package to document your job. The Daily Report records hourly rig activities and includes a summary of the day's drilling results. The BHA Report includes graphics, drilling summary, bit, motor, and mud data – slide sheets and hydraulics calculations reports may also be generated. Daily Costs are tracked and totaled. In addition, Tool Inventory, Tool Utilization summaries and Shipping Tickets may be printed. All information pertaining to the job saved in one file! And all of these reports may be exported in .PDF format, allowing them be attached to an E-mail transmission and reproduced at a remote location.

## PROGRAM DESCRIPTION and REQUIREMENTS

WinSURV II is a big program and requires ample resources to run smoothly. Fortunately, since the introduction of the software, advancements in computer technology mean that almost any new PC on the market will be capable of running WinSURV II efficiently and can be purchased for a reasonable price.

WinSURV II is written in Visual Basic 6.0 and uses Microsoft's ACCESS 97 database engine.

### **Minimum Machine Requirements:**

128 MB of RAM, preferably 256 MB for Windows 98 OS.

256 MB of RAM, preferably 512 MB for Windows 2000 or XP OS.

200 MHz Pentium Processor

25 MB of Disk Space (although you should always have **at least** 60 MB free to run Windows)

As any heavy computer user who runs Windows knows, the faster, and more memory, the better.

### **Important DATE FORMAT Note**

Dates can present a problem if all parties are not in agreement on how to define them numerically. For instance, consider the difference between the conventions used in the United States (MM/DD/YY) and in Europe (DD/MM/YY). To ensure that WinSURV II functions properly and searches and sorts the dates accurately, it is advised to set the Windows Regional Option or Setting (under the Windows Control Panel) to the English (United States) standard format and set the Short Date format as either MM/DD/YYYY or MM/DD/YY. This specification is generally transparent to the user, since most dates are handled through a graphical interface (point and click on a calendar) rather than direct keyboard entry. (Some other formats, such as YYYY/MM/DD, work fine; the European convention, DD/MM/YY, will not work. *Do not use "single character" formats such as M/D/YY*).

A quick way to verify if the Date format setting is correct is to look at the date displayed beneath the calendar on the Daily Report / Date Info page. If the date is not displayed in the MM/DD/YY (or valid alternative) format, close WinSURV II and reset it as described in the previous paragraph, then reopen the program.

It is also necessary that the number format follow the English (U.S.) standard regarding decimals and commas, for example: 120,000.99

## WinSURV II START UP SCREEN

The screenshot shows the WinSURV II software interface. The title bar indicates the version is 3.0.2711, developed by Performance Drilling Technology, Inc. in 1990-2004. The menu bar includes File, Edit Data, Setup Mode, and a Help menu. The toolbar contains icons for Print, Page Width, and other functions. The main window is divided into several sections:

- Left Panel:** A tree view showing the hierarchy of jobs and reports. It includes sections for 'ALL JOBS', 'COMPANIES', and 'Job Selection'. The 'Job Selection' section is currently selected, showing a list of jobs and reports.
- Well Information:** A form for entering well data. It includes fields for Job No., Company, Location, Date, and Well Name. The 'BHA # 2' is displayed in the top right corner.
- BHA Summary Information:** A table summarizing the BHA data. It includes columns for Time In/Out, Rotary Hours, Start Depth, and RPM. The data is organized into rows for different BHA components.
- BHA Detail:** A table providing a detailed breakdown of the BHA components. It includes columns for Description, Weight, Length, and Tap Count. The data is organized into rows for different BHA components.

Job Selection Screen (START-UP SCREEN)

An example of the WinSURV II start up screen is shown above with a preview of an individual BHA report. Virtually all existing reports in the database can be quickly accessed, previewed

and printed from this screen, saving you the time of loading a specific job and searching for the particular report you need.

The “tree” at the left displays all jobs in the database, organized under Company Names. Click on the plus sign to the left of any item to expand the tree to the next lower level. (Double-clicking on the ALL JOBS heading will fully expand the entire tree; double-click again to collapse it completely). The associated Job Tool Inventory, Bottom Hole Assemblies and Daily Reports for each job are listed at the lowest level of the hierarchy. The text box at the top left indicates which job is currently selected, and the total number of BHA’s and Daily Reports for that job. To select a different job, click to highlight either the job line itself (ExampleJob,Well Name) or any associated BHA or Daily Report.

To load the job and proceed to the main part of the program for data entry and editing, click the **Go To Selected Job** button at the top left.

## ADDING A NEW JOB

To start a new job, click the **ADD JOB** button at the top left to open the “Add or Modify Job Information” form. The program prompts you to enter a New Job Number in the first text box; the box is ‘green-lighted’ as long as the Job Number is legal. A ‘legal’ or valid Job Number must be *unique* (even under different Company names) within the database; as soon as you enter a duplicate record, a ‘red-lighted’ text box lets you know that it’s ‘not legal’. Continue entering text until it switches to green again. Enter a Company name in the second text box, or if you are adding a job under an existing Company, you can click on the arrow to select that Company from the list. Naming convention is not case-sensitive (e.g., PDT and pdt, or JOB#1 and job#1 are considered equivalents). These are the only two items that must be filled in initially to create a new record; you can fill in the rest of the information either here on the form or after the job is loaded into the main part of the program.

The screenshot shows two overlapping windows titled "Add or Modify Job Information". The top window has "Job Number" set to "123" and a red error message "NOT LEGAL JOB NUMBER". The bottom window has "Job Number" set to "NewJobNo Here" with a green "LEGAL JOB NUMBER" status. Other fields in the bottom window include "COMPANY" (MyOilCo), "Location" (Example Oil Company), "BHA NAME" (PDT), and "State/Province". There are "CANCEL" and "OK" buttons at the bottom of the bottom window.

The Job Number and Company may also be edited later. You can either select the job on the tree and then click the **EDIT** button at the top left, or double-click on the Job Number and select “Edit Job” from the menu to open the form.

Click OK to close the form when finished (or CANCEL if you decide not to add a new job).

Once a new job number has been added, select it by clicking on it from the tree. Click **Go to Selected Job** at the top left of the screen to begin to enter your job data.

## CREATING a JOB TOOL INVENTORY



A recent enhancement of the WinSURV2 program lets you view, build or edit a tool inventory and print a Tool Utilization Report directly from the start up screen. Click on **Job Tool Inventory** on the tree under the Job number to open an inventory spreadsheet such as the example shown below.

The table duplicates the Tool List from within the main program, but you may find it more convenient and easier to use.

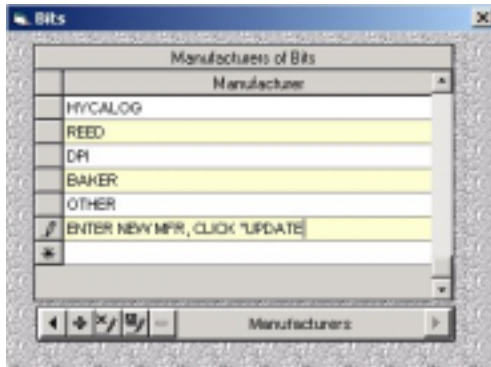
The first three column headings are red as a reminder that you must make an entry for these items; if you don't,

the record will be erased (other fields may be filled in at any time). Select from the pull-down list (do not try to type a full entry – though you *can* type the first letter to navigate the list more quickly: e.g., typing 'J' in the Tool Group field will bring you straight to 'Jars').

List of Inventory for JOB JOB#Example							
Tool Group	Tool Type	Serial Number	ON SITE	MFG	Description	ODFrac	IDFrac
Bits	PDC	106284	<input checked="" type="checkbox"/>	HYCALO	DSX 189 GAW	6.5	
Bits	PDC	204579	<input checked="" type="checkbox"/>	HYCALO	RSX221F+GSW	6.5	
Bits	ROCK	MP-3014	<input checked="" type="checkbox"/>	SMITH	SMITH ROCKBIT	6.5	
Float Sub	Pin Down	6-008	<input checked="" type="checkbox"/>	SDI	4-3/4 Float Sub	4.75	2.70
Hole Opener	Standard	JS6040	<input checked="" type="checkbox"/>	J&S	6-1/2 HOLE OPENER	4.75	2.5
Jars	Standard Picture	380-47338-6	<input type="checkbox"/>	GRIFFITH	4-3/4 DRILLING JARS	4.69	2.25
Motors	Steerable Slick	4115	<input type="checkbox"/>	BICO	4-3/4 4.5 XPS 1.25"	4.3/4	1.5
Motors	Steerable	426	<input type="checkbox"/>	SDI	4-3/4 4.5 XPS 1.25"	4.75	1.5
Motors	Steerable	498	<input type="checkbox"/>	SDI	4-3/4 7.8 XPS 1.5"	4.75	1.5
Muleshoes	Standard	DR-3929	<input checked="" type="checkbox"/>	DIR. REN	4-3/4 MS SUB	4.75	2.25
MWD	Double Box	67-002	<input checked="" type="checkbox"/>	SDI	4-3/4 gMWD	4.75	2.8125
Stabilizers	Integral Pin Down	15885	<input checked="" type="checkbox"/>	StabilDri	7" B Non-Mag Stabli	6.25	2.8125
Stabilizers	Integral Pin Down	DR-3203	<input checked="" type="checkbox"/>	DIR. REN	6-1/8 NM STAB	4.81	2.25
Stabilizers	Integral Pin Down	DR-4916	<input checked="" type="checkbox"/>	DIR. REN	6-3/8 NM STAB	4.75	2.14
X-Over	Double Pin	1-223	<input checked="" type="checkbox"/>	SDI	4-3/4 X-OVER	4.75	2.25
X-Over	Double Box	68-003	<input checked="" type="checkbox"/>	SDI	4-3/4 X-OVER	4.75	2.75
Motors	Steerable Slick	SN XXXX	<input type="checkbox"/>	BICO	4-3/4 4.5 XPS 1.25"	4.3/4	1.5
Motors	Steerable Slick	SN XXXX-1	<input type="checkbox"/>	BICO	4-3/4 4.5 XPS 1.25"	4.3/4	1.5

Work your way across the page to fill in the data. **ODFrac** and **IDFrac** mean that you can enter the OD's and ID's either as a decimal (4.75) or as a fraction (4 <sup>3</sup>/<sub>4</sub>). It's worth it to fill in the whole line, because it can save you time in the long run. See the Motor that is highlighted in the figure? Note the last two lines are copies of that motor record – all you have to do is select the item you want to copy, then hold down **CTRL-A** on your keyboard and it will be automatically added to the list. Then you need only edit the serial number or length or whatever rather than have to fill in the whole thing!

You can modify the list of manufacturers for any particular Tool Group by double-clicking within the **MFG** field for that tool to open a form such as shown.



To Add to the list, click the ‘plus’ (+) sign at the bottom to start a new line, type in your text, click the ‘update’ icon (the floppy disc).

To delete an item, highlight the line by clicking in the left-most column, and then either click the ‘minus’ (-) sign or press the Delete key.

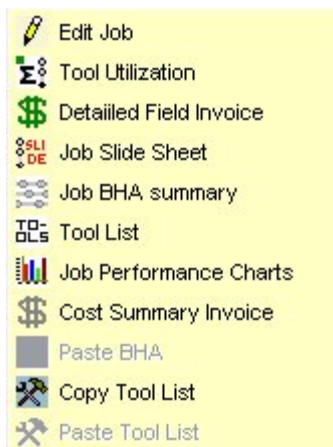
Click the ‘X’ at the top right to close the form.

To delete an inventory item, just highlight the line by clicking in the left-most column, then press ‘Delete’.

Above the spreadsheet are buttons that let you print out Tool Utilization reports for all tools run on the job, for a Tool Group, or for an individual tool, (A tool does not need to be in the inventory to have a Utilization Report. These reports are based solely on the appearance of the tools in actual BHA’s with associated daily activities.

## VIEWING and PRINTING REPORTS (START-UP SCREEN)

Double-click on a Job Number to see the available options:



Select a report to view it in a window on the right side of the screen. Use the controls at the top of the window to adjust the viewing size of the report, or to print it. To edit any data you need to load the job and go to the appropriate data entry page. And of course, all reports can also be printed from within the main program.

Note the dimmed options “Paste BHA” and “Paste Tool List”.



## “COPY & PASTE” TOOL LISTS and BHA’s

WinSURV2 now allows for the copying and pasting of BHA’s and Tool Inventory Lists from one job to another. This is a convenient function for both directional drillers and office personnel that saves a considerable amount of time in the field and when preparing proposals for tender.

The capability to copy Tool Lists from one Job to another would be useful for job scenarios where a directional driller moves from one slot to the next on a platform using the same set of tools but needing a different job number. Just double click on the Job Number and select COPY TOOL LIST. Then double click on the newly created job (presumably, this has already been done) and select PASTE TOOL LIST.

Double-click on a Bottom Hole Assembly to see the available options:

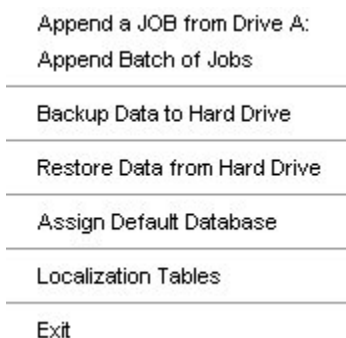


The first five choices are the BHA report options. Select COPY THIS BHA to allow you to utilize the same BHA for another job without having to build it from scratch. The copy is placed on the clipboard and the PASTE BHA menu item will be enabled in both menus. You can double-click either the JOB Number or any BHA under that job and select PASTE BHA from the menu. Enter the number for the BHA you want to create, click OK and it’s done!

Note that the BHA number entered must not duplicate an existing BHA number, or an error will result. However, the existing BHA will *not* be overwritten. Since WinSURV2 automatically creates BHA#1 when a new job is added, if the BHA you want to paste will be the first one for the new job, you should delete the ‘placeholder’ BHA#1 before pasting.

**Menu Bar** – At the top left of the screen is a menu bar listing three options: **File**, **Edit Data** and **Setup Mode**.

### FILE OPTIONS



Append a Job from Drive A: - To add job data, no longer automatically restricted to floppy discs (though the subsequent message box may throw you – just click ‘RETRY’ to open a dialog window to browse for your file). If the identical Job Number already exists in the database, the program checks to see whether the file to be appended has a greater number of BHA’s and Daily Report days; if it does, the current Job data on the hard drive will be overwritten.

Append Batch of Jobs – This function is provided for office coordinators who are receiving updated Job files from multiple ongoing jobs on a regular basis to streamline the appending of



new data. Rather than having to append Jobs one at a time, the files may be placed in the WinSURV2\BatchInputFiles folder. Choosing this option then allows you to process a list of jobs simultaneously. You also have the option to automatically generate and print any 'new' Daily Reports and BHA Reports that were not part of the existing Jobs.

Backup Data to Hard Drive - This action backs up ALL jobs in the WinSURV II database, not just the current job, since all jobs share a common table structure. Automatically creates a file named BACKUP.mdb (located in the WinSURV2 directory) containing BHA, Daily Items, Daily Costs, and Tool Inventory tables. Will overwrite an existing BACKUP, so rename the file if you need to maintain a previous backup intact.

Restore Data from Hard Drive – Looks for and loads the BACKUP.mdb file (and only that specific filename), though this can be somewhat confusing. Because all jobs are saved in a single database file, the **Restore** function will work *only* if there is no duplication of even one Job Number in the current database. To illustrate, consider a scenario in which three jobs, appearing on the Job Selection Screen as JOB1, JOB2 and JOB3 have been backed up. As long as *any one* of these jobs exists in the current database you will not be able to **Restore**: ironically enough, the duplicate jobs must first be deleted, before their older forms can be restored. Any data entered since the last backup would thus be lost. Thus, if you are unsure of what jobs are contained in the BACKUP.mdb file, and which might be duplicated, you can edit the current job numbers slightly, such as by adding an 'X' temporarily, until you can review the restored data.

Assign Default Database – By default, all jobs are saved in one file, called PDTMAST.mdb. With time that file can become fairly large, so you may want to create separate files to group the jobs of different customers. Once you have accomplished that by manipulating the PDTMAST file, you could then switch between databases through this function. This also allows you to work with a file from another user without compromising your own database (rename the file first, since there cannot be more than one PDTMAST mdb files in the same directory).

Localization Tables – Translation tables for language or local use customization of data input screens and report output. See “Multi-Lingual Localization”.

Exit - Close WinSURV II program and return to the desktop or another open application. The next time the program is run the last job loaded remains the currently selected job.

**SETUP MODE** – Simply a toggle switch to permit access to a Master Inventory Tool List. The **Inventory Management** button is dimmed for Field Mode and enabled for Office Mode.

## VIEW and EDIT BASIC JOB DATA

WinSURV II now allows you to view and edit certain job information (primarily that found on the Basic Job Data folder in the main program) in a spreadsheet format from the start up screen.

Spreadsheet Edit of Job Data
Spreadsheet Edit of Date Information
Edit Lookup Tables

Select **Edit Data>>Spreadsheet Edit of Job Data** from the menu bar to view the spreadsheet as shown below.

With a large number of jobs in the database this may be the quickest way of finding and selecting a job. All jobs in the database are listed alphabetically by Company name. Click the appropriate “Scope” button to view All Jobs, the Current Job, or only the jobs associated with the currently selected Company. Individual fields within the spreadsheet may be edited directly, and an entire job can be deleted by clicking in the left-most column to highlight the line and pressing the Delete key on your keyboard. Clicking within any field makes that job the current job as indicated on the tree and in the text info box.

Spreadsheet Scope

☒ View all JOBS  
☐ View Current JOB  
☐ View JOBS by COMPANY

List of all jobs in C:\Minsurv2\pdtnrest.mdb

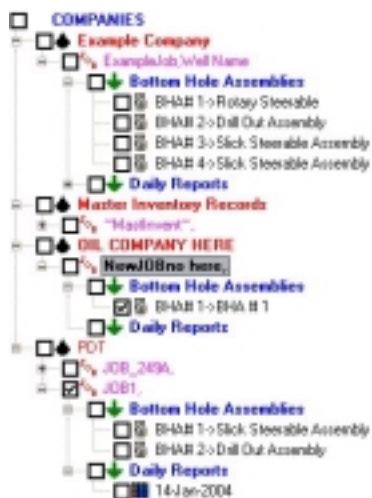
	Company	Job ID	Location	API JOB #	Rig Name	State/Province
<input checked="" type="checkbox"/>	BP America Production	2101003359	Louisiana Marsh	17-101-01456-01	Parker 15-B	Louisiana
<input type="checkbox"/>	BP America Production	ST01BP00	LA MARSH	17-101-01-456-01	PARKER 15-B	LOUISIANA
<input type="checkbox"/>	Example Oil Company	JOB#Example	Some Location	API JOB NO	Some Rig	Your State
<input type="checkbox"/>	Example Oil Company	JOB#Example1	Some Location	API JOB NO	Some Rig	Your State
<input type="checkbox"/>	Master Inventory Reco	-MasterInvent-	Office			
<input type="checkbox"/>	PDT	123	HOUSTON			TEXAS

Similarly, you can view and edit the personnel and other information found on the Daily>Date/Info folder by selecting **Edit Data>>Spreadsheet Edit of Date Information**.

All other editing (e.g., Daily Report, Cost, BHA items) must be done in the main program after loading a Job.

## Deleting Jobs And Bottom Hole Assemblies

Another way to delete an entire Job and all the records it contains is through the tree interface. Click the **Mark & DELETE** button at the upper left of the screen.



Click to put a check mark in the box next to the item you want to delete, then click a second time to remove it. Multiple items may be checked and deleted at the same time. Although ‘check boxes’ appear next to each item in the tree, only the JOB and individual BHA are activated. Individual Daily Reports can only be deleted in the main program after a job is loaded, and the ‘COMPANY’ line will be eliminated automatically if there are

no jobs associated under it.

(BHA's for specific jobs may also be deleted from within the main program.)

**NOTE:** Be advised that once you click 'Mark & DELETE' a second time, there is no warning before all checked jobs and BHA's are deleted. *Deleting a JOB deletes all BHA's and Daily Reports for that job.* Be very certain that is what you want to do, as quite a significant amount of data can be wiped out instantly with one click (if you haven't backed it up), so again, be sure to "double check" what you're doing to avoid a major mishap.

See the discussion about Backup and Restore under **File Options** before choosing to delete a job.

## "MULTI-LINGUAL" LOCALIZATION

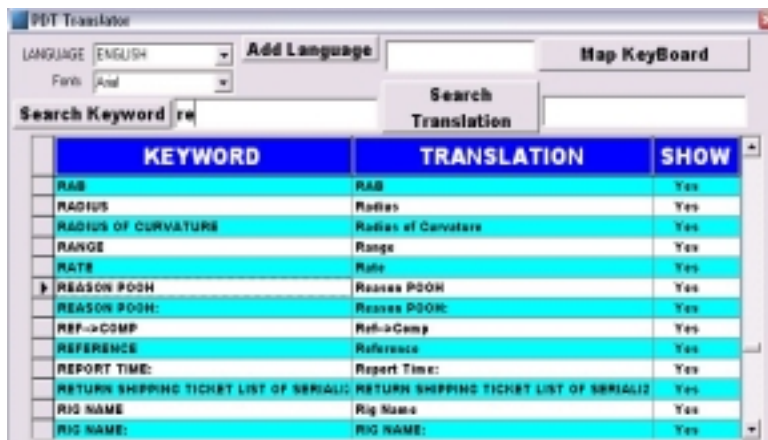
Winsurv2 now has the potential of providing reports in many languages. As time progresses, more translation tables will be incorporated to offer an increasing choice of languages. This multi-lingual capability is not restricted to "non-English", and in effect is more properly described as a "customization option". This simply means that the data labels and headings in the reports can be altered to fit local needs and preferences. For example, in the U.K. the use of 'State' and 'County' is not appropriate, so these keyword translations in the English table may be edited for alternate terminology, which will then be reflected in both the data input screens and the reports.

While this powerful feature provides the client with great flexibility and the opportunity for individualized and enhanced reporting capability, it is highly recommended that only supervisory personnel become involved with altering the tables to prevent potential data mix ups and inaccurate report presentations.

Existing options may be accessed from the drop down list in the upper left of the start up screen. To edit a table or add a new "language", select FILE>>LOCALIZATION TABLES from the menu bar. The PDT TRANSLATOR is shown below.

The KEYWORD column lists the terms as originally defined by WinSURV2. The TRANSLATION column lists the terms as you want them to appear. Each column is dynamically searchable by typing in the first letters of the term you're looking for (for example, "re", as seen in the figure).

There are inherent limits to the localization function. You cannot rearrange and redesign the reports; rather you substitute for original terms and in some cases, desired parameters. You should not alter the KEYWORD list, since these variables may be specified in the program code; similarly, fields for calculated quantities (such as 'average ROP') will always display those values, and so it would be pointless (and *very* confusing!) to change anything other than the designated term for such values.



The SHOW column is a YES/NO switch. Set it to NO to prevent a label from being displayed on the input screen or report.

MAP KEYBOARD is a specialized function to map an alternate character set to a standard English keyboard. Contact PDT for information about this application.

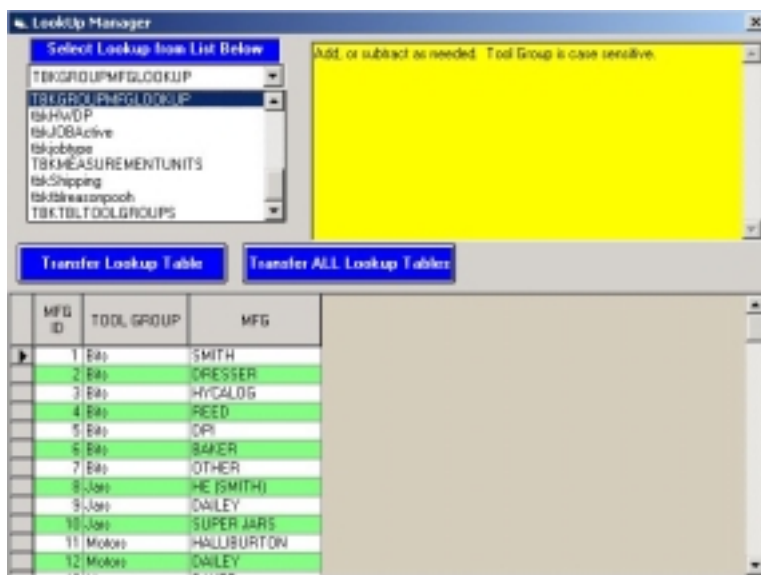
Note that the language which appears in the text box at the top of the start up screen is a global setting applied for all jobs in the database. Once selected, it will remain the default until a different selection is made.

## CREATING CUSTOM LOOK-UP TABLES

Throughout the WinSURV2 program there are many “look-up” tables that prompt you to choose from a list rather than type text, and many of these may be modified to suit your situation (e.g., tool manufacturers, cost groups, casing and drill pipe tables). When the program is installed, a default set of tables from PDT is written to the database. However, if you develop a standard for your company, you shouldn’t have to edit these tables one by one for each individual computer.

For this purpose, WinnSURV2 software versions 271 and later utilize a separate database file called PDTLookups.mdb, and it must be located in your WinSURV2 directory. This file is *not* part of the installation, but it provides a way to overwrite the defaults with your own customized tables. This feature is intended primarily for office supervisors; however, field personnel should know how to manage and transfer a custom file.

To modify these tables and create a custom mdb file, select EDIT DATA>>EDIT LOOKUP TABLES from the menu bar.



At the upper left is a drop down list of all the tables that you may modify. Select the one you want and it is displayed at the bottom, along with helpful tips and warnings relevant to each table.

To delete an item from a table, select it and press ‘Delete’.

To add an item, scroll down to the bottom of the table and, generally speaking, just ‘fill in the blanks’.

If you have only modified or updated a single table, you can then click the TRANSFER LOOKUP TABLE button.

Click TRANSFER ALL LOOKUP TABLES to transfer the entire set of tables. Once transferred, this set of custom tables will remain fixed and available to all jobs as long as a full software installation is not performed. However, if you assign different default databases, the tables need to be transferred for each database individually.

## Inventory Management

Inventory Management is a feature intended for office coordinators to facilitate the creation of a Master Tool Inventory database from which load-out lists and shipping tickets may be generated and tools tracked by job number. Field users may still be interested in reading this section to get an idea of how inventory management is set up, since the TOOL LIST within the main program utilizes a similar structure. Check SETUP MODE>OFFICE MODE from the menu bar and click the Inventory Management button at the upper left. An example of a Master Assets List is shown in Figure 2. Use the horizontal scroll bar to view the columns extending to the far right of the table. Click **Reporting** from the menu to generate a Loadout list or a Shipping ticket.

Now that WinSURV II allows you to copy a BHA from one job to another, the Master Inventory may be of lesser interest if you don’t intend to use it to track tools or shipping tickets.

Three of the columns seen on the Master Assets List are key fields that provide the means to view selected portions of the list segregated by Job, Tool Group type or Size Category. These alternate views may be introduced by making selections from the three drop down boxes at the top of the screen. They may be utilized one at a time or in combination, e.g., to view only 6 ½ inch motors from the Example Job.

**Master Assets List**

Reporting

Size Category: **All** Tool Types: **All** **SHIPPING TICKET** 

**TRANSFER**  Example Job

**Master Inventory List**

Tool Description					Tool Body Dimensions			Connections	
Tool Group	Tool Type	Serial Number	Description	Manufacturer	ID (Feet, IN)	OD (Feet, IN)	Length	Top Connection	Bottom Connection
Jars	Standard Picture	Jar1	JAR1	DAILEY	2.75	8 1/2	23.44	4 1/2 REG	4 1/2 REG
Motors	Steerable	Motor 001	Motor	BICO	0	8 1/2	23.45	4 1/2 REG	4 1/2 IF
Motors	Steerable	Motor 002	Motor	BICO	0	8 1/2	34.23	4 1/2 REG	4 1/2 REG
Motors	Steerable	Motor 003	Motor	BICO	0	8 1/2	23.23	4 1/2 REG	4 1/2 REG
Motors	Steerable	Motor 004	Motor	BICO	0	8 1/2	24.34	4 1/2 REG	4 1/2 REG
Motors	Steerable Stick	Motor 005	Motor	HALLIBURTON	0	8.5	22.43	4 1/2 REG	4 1/2 REG
Mudshoes	Standard	MS1	Mudshoe Opening sub	Pathfinder	2 3/4	8 1/2	3	4 1/2 IF	4 1/2 REG
MWD	Double Box	MWD1	MWD	Pathfinder	4	8	20	4 1/2 REG	4 1/2 REG
MWD	Double Box	MWD2	MWD	Pathfinder	3	4.75	18.5	3 1/2 IF	3 1/2 IF
Stabilizers	Double Pin	STB1	STAB-8	Datol	3	8 1/2	5	4 1/2 REG	4 1/2 REG
JOvers	Double Pin	JO1	DPND	OTHER	3	8.5	2	4 1/2 REG	4 1/2 IF

Navigation:

ALL tools in inventory

*Master Inventory List (JOB SELECTION SCREEN:INVENTORY MANAGEMENT)*

Building the Master Inventory is simply a matter of filling in the boxes, moving left to right across the page by pressing the <TAB> key. Following is a description of the fields in the table.

### Tool Description

The TOOL GROUP is selected from a drop down list. It is a key field that allows a selective view of the Master List based on individual tool groups. The TOOL TYPE is selected from a drop down list specific to Tool Group. It determines the pin/box tool joint configuration and picture type for BHA graphics. Enter the SERIAL NUMBER of the individual tool. You must enter a serial number, and within a particular Tool Group the serial number must be unique. Type the DESCRIPTION of the tool that will appear on BHA reports and graphics. The MANUFACTURER is selected from a drop down list specific to Tool Group, and this list may be modified by double clicking on the drop down button.

### Tool Dimensions

Enter the dimensions in whatever units will be used on the job. The ID's and OD's may be entered either as decimal values or fractions.

### Connections

Tool joint connections for the top and bottom are selected from a drop down list. To avoid having to scroll through the entire list, type the whole number value followed by a space, and only a subset of connections beginning with that number will be displayed.

## **Stabilizer Blade**

Enter dimensional information of the blade center point and gauge diameter.

## **Location**

The ON SITE checkmark and JOB NO help to track the tool's location. A check in the ON SITE box indicates that the tool is "in house", at the base location, not the job site. The JOB NO is specified by selecting it from the drop down list at the top of the screen of all jobs in the database, then selecting the item(s) on the Master List designated for that job, and clicking on the TRANSFER button. Thus, for a new job it is necessary to first add it to the database on the JOB SELECTION screen. All tools that have been identified by JOB NO may easily be viewed independently by selecting the job and pressing the VIEW JOB INVENTORY button to the right of the text box. The button changes to VIEW MASTER INVENTORY to switch back.

## **Materials**

Enter the WEIGHT of the item. Total weights are calculated and included on the Shipping Ticket and in the Hydraulics program module.

## **Size Category**

This is another field that allows you to efficiently sort the tool list by viewing only those of the appropriate size from the Master List.

## **CREATING A LOADOUT LIST OR SHIPPING TICKET**

To generate a Loadout list for a specific job, follow the steps outlined below:

- 1) Select the Job Number from the drop down list of jobs.
- 2) Select the item from the Master Asset List by clicking on the left border of the row to highlight it. Multiple items may be made selected.
- 3) Press TRANSFER to enter the selected Job Number in the JOB NO column of the selected items.
- 4) Mark the items as ON SITE. The quickest way to do this for a long list of items is to press VIEW JOB INVENTORY to segregate the selected tools, and then press BRING HOME, which checks all items for the selected job as ON SITE.
- 5) Choose Reporting>Loadout List to preview the printout.
- 6) PRINT it!

To generate a Shipping Ticket, the first four steps given above must be completed.

- 5) Choose Reporting>Shipping Ticket from the menu bar or press the button SHIPPING TICKET to move to the screen shown in Figure 3.



**Figure 3: Shipping Ticket Setup Screen**

At the lower right corner is the list labeled Tools On Site in Master Inventory. If you followed the steps 1-5, the selected tools will appear in this area, denoted only by Tool Group, Serial Number and Description. On the lower left is the Tools to Send area. There may very likely be a list of tools displayed already since the program returns to the last Shipping # that was used. If this is the case, press the ‘+’ button on the edit bar above the lists to advance to a “clean page” for a new ticket. The Shipping Ticket numbering system is more like an index shared across all jobs; in other words, there isn’t a separate set of numbers for each individual job, and you are restricted to using the given number. If you have your own numbering system, you might use the comment space or ‘Sender’ line in the FROM side of the header to document it.

To create a Shipping Ticket, the tools you wish to send must be moved over to the Tools to Send list. Select the item on the right side by clicking on the left border to highlight the row, then press the ‘◀’ (left arrow) to transfer them. (Multiple items may be selected by holding down the <CTRL> key while selecting the row). With this action the ON SITE checkmarks for those items will be cleared on the Master Asset List to indicate they have left the base and are at the job site.

The Shipping # is displayed at the upper left corner. Below it the user selects the Date of the shipment from a drop down calendar; the date may also be entered directly using the same Windows Regional Setting ‘Short Date’ format (e.g., MM/DD/YYYY).

The Header information occupies the upper part of the screen, indicating FROM and TO where

the tools are to be shipped. Radio buttons on each side provide an option to choose from the list of Jobs in the database or from an address book that you can create. To add or edit an address, select the ADDRESSES button on either side, and double click in the color highlighted first text box, which opens a dialog window. Use the edit bar to add an address. The header information for either Job or Address may be temporarily modified in the text boxes on the screen for the purpose of printing a Shipping Ticket; however, such changes are not recorded in the Address book or Job Information files. Press PRINT TICKET to preview the Shipping Ticket.

Click on the 'X' in the extreme upper right corner to exit the Shipping Ticket or Master Assets List screens.

An office coordinator may choose to send a floppy disk with the Tool Inventory as represented by the items transferred to the specific job (as mentioned previously under **Location**). In the Office Mode, the TRANSFER action within Inventory Management copies those items onto the Tool List of the selected Job Number. That list may then be downloaded to disk by exiting Inventory Management, going to that job from the Job Selection screen, and choosing **File>Save Current Job to A: Drive**. The field personnel could then upload the data to the field computer by choosing **File>Append a Job from Drive A:** from the Job Selection screen as the first step to setting up the job, thereby saving the effort of data entry and ensuring that the field and the office begin the job with identical lists.

## MAIN DATA ENTRY – The ‘Folders’

**Figure 4:** *Job Information Screen (JOB INFO⇒BASIC JOB DATA)*

WinSURV II organizes JOB, BHA and Daily Information data using a folder-tab metaphor. There are six main folder tabs: JOB INFO, TOOL LIST, BHA INFO, BHA ITEMS, DAILY and DAILY ITEMS. Those tabs can be seen at the top of Figure 4. The tab that is selected above is JOB INFO. Under the JOB INFO tab are four sub-folders: BASIC JOB DATA (selected in the example above), JOB COSTING, MEASUREMENT UNITS and JOB SUMMARY. A complete outline summarizing the folder structure is as follows:

### ➤ JOB INFO

- BASIC JOB DATA - Enter or edit Job identification information. Appears on Report headings
- JOB COSTING - Summary of all charge entries to date
- MEASUREMENT UNITS - Select user units to be used in Hydraulics and as screen and report labels
- JOB SUMMARY - Job Summary data presented in written and graphic form

- TOOL LIST
  - List of Tool Inventory and specifications
- BHA INFO
  - SUMMARY
    - Summary of data for currently selected BHA presented in written and graphic form
  - BIT DATA
    - Bit data for currently selected BHA including IADC Dull Bit Code
  - MOTOR DATA
    - Motor data for currently selected BHA
  - BHA COMMENTS
    - Comments attached to currently selected BHA that appear on reports
- BHA ITEMS
  - Entry or editing of BHA components and generation of graphic diagram for currently selected BHA
- DAILY
  - DATE/INFO
    - Calendar to select or add a date; Personnel on location for selected date
  - COMMENTS
    - Comments to appear on Daily Report for selected date
  - DAILY SUMMARY
    - Summary of hours and activities for selected date presented in written and graphic form. Select desired Report Time
  - COSTS
    - Entry or editing of Costs by category for selected date
- DAILY ITEMS
  - Entry or editing of Daily Activity records for selected date

There are several types of data entry methods utilized in WinSURV II. In the case of Figure 4, above, entering data is simply a matter of filling in the boxes and pressing the <TAB> key to move to the next box. For the boxes labeled JOB STATUS and JOB TYPE a drop down field box is used. This method of entry limits what the user can input, requiring a selection from the displayed choices. On other screens spreadsheets are used to enter data, primarily for BHA Items and Daily Items.

Entering BASIC JOB DATA is straightforward. Type in the data and the click on the UPDATE JOB INFO button when you are finished making your changes. You may already have entered much of this information in the Add or Modify Job Information dialog box from the start up screen, and most of this information will remain constant throughout the course of a job. Maintaining Job Status and Job Type is something that would only be done in an office environment where the user may want to query the status of a batch of jobs. The field user need not be concerned with these items.

## JOB COST SCREEN

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**JOB INFO** **TOOL LIST** **BHA INFO** **BHA ITEMS** **DAILY** **DAILY ITEMS**

**BASIC JOB DATA** **JOB COSTING** **MEASUREMENT UNITS** **JOB SUMMARY**

0. ENTRY OF DAILY ITEM CHARGES IS DONE UNDER THE COSTING IN DAILY. CLICK HERE TO GET THERE.

Cross Query Summary Print Report

GROUP DESCRIPTION		CHARGE STRATEGY	CHARGE METHOD	MAXIMUM CHARGE	PRICE	PRICE STRUCTURE	PRICE	PRICE
DATE	ITEM DESCRIPTION	QTY	Unit	Price/Unit	MAXIMUM CHARGE	PRICE	PRICE	PRICE
11/03/03	Directional Supervisor	1	DAY	\$800.00	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Float Subs	2	DAY	\$11.90	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Rented On Floor Subs	2	DAY	\$11.90	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Motor	3	DAY	\$75.00	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Stand By Dr 6-3/4" Motors	1	DAY	\$63.75	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Offshore	1	DAY	\$63.75	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Rented On Offshore Basket	1	DAY	\$63.75	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Steel	2	DAY	\$25.00	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Rented On 10" Steel Porey Collars	2	DAY	\$25.00	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	DAY	1	DAY	\$800.00	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Directional Supervisor	1	DAY	\$800.00	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Float Subs	2	DAY	\$11.90	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Rented On Floor Subs	2	DAY	\$11.90	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Motor	3	DAY	\$75.00	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Stand By Dr 6-3/4" Motors	1	DAY	\$63.75	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Offshore	1	DAY	\$63.75	\$8.00	\$8.00	\$8.00	\$8.00
11/03/03	Rented On Offshore Basket	1	DAY	\$63.75	\$8.00	\$8.00	\$8.00	\$8.00

**TOTAL COST** \$83,289.98

JOB NUMBER: ExampleJob BHA # 4 of 4 Date: 24-Nov-2003 Rec'd Ship #

**Figure 5: Job Cost Summary Screen (JOB INFO⇒JOB COSTING)**

The JOB COSTING screen displays a compilation of each input from all the daily cost sheets for the entire job. It is provided to allow the user to review all of the charges on one spreadsheet; however, it is not possible to edit any of the items from here by design. To alter costs for a given day you must select the specific day from the DAILY⇒DATE/INFO calendar and then click on the COSTS tab. (For a complete discussion of cost tracking see DAILY REPORT). In this format the date is not necessarily part of the display; to determine which date may need editing and to view the information in a more compact, spreadsheet format, click on the Cross Query Summary button to the upper right of the screen. Any CHARGE GROUP category that has been incurred is shown in alphabetically sorted columns. The widths of these columns may be changed in normal spreadsheet fashion by clicking on the heading border. To switch back, click on View Details. Slide bars permit scrolling for both views. A printed output of whichever view is currently displayed may be obtained by clicking Print Report.

## JOB MEASUREMENT UNITS

Measurement	Unit	Conversion	Unit Label
Density	LB/SQAL	1	PPG
Flowrate	Gallons/30/Minute	1	GPM
HP	Hydraulic HP	1	HP
ID	Inches	1	in
IMPACT	Lbs Force	1	Lbs
JETS	32nds	1	32nd
Length	Feet	1	ft
Mass	Pounds	1	lb
OD	Meters	1	m
Pressure	Boiling In	1	PSI
TFA	Sq. Inches	1	sq
Torque	FT-Lbs	1	FT-lbs
Viscosity	Centipoise	1	CP
YieldSt	LB/3000"	1	LB/3000"

**Figure 7:** Job Measurement Units (JOB INFO⇒MEASUREMENT UNITS)

Each job in WinSURV II can be assigned its own set of measurement units. These units are used primarily in the Hydraulics program. To make a selection, click in the UNIT column of the appropriate Measurement row and then select the unit of measurement you wish to use from the drop down box. The choice between feet or meters for length units is shown as an example.

## JOB SUMMARY SCREEN

The Job Summary Screen provides the user with a quick text summary of relevant job information pertaining to the 'job-to-date'. All data is derived from the DAILY ITEMS inputs. The user merely has to keep up with the daily report activities for an accurate, up-to-the-hour summary. Press the CALCULATE button to incorporate any recently entered data and recalculate the summary. It may take a few seconds depending on the size of the job and the speed of your computer.

## TOOL LIST

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JOB INFO **TOOL LIST** BHA INFO BHA ITEMS DAILY DAILY ITEMS

VIEW OPTIONS  
☒ ALL TOOLS ☐ TOOLS ON SITE

☒ All Tools ☐ Select Tool

SHIPPING

Tool Inventory											
Tool Description						Tool Body Dimensions			CONNECTIONS (Use		ON SITE
Tool Group	Tool Type	Serial Number	Description	Manuf	ID [Fract. in.]	OD [Fract. in.]	Length	Top Connection	Bottom Connection		
Jars	Stander-Picture	Jar1	JAR	DAILE	2.75	8 1/2	23.44	4 1/2 REG	4 1/2 REG	<input checked="" type="checkbox"/>	
Motors	Steersabl	Motor 001	Motor	BICO	0	8 1/2	23.45	4 1/2 REG	4 1/2 IF	<input checked="" type="checkbox"/>	
Motors	Steersabl	Motor 002	Motor	BICO	0	8 1/2	34.23	4 1/2 REG	4 1/2 REG	<input type="checkbox"/>	
Motors	Steersabl Slick	Motor 005	Motor	HALLII	0	8.5	22.43	4 1/2 REG	4 1/2 REG	<input checked="" type="checkbox"/>	
MWD	Double Box	MWD1	MWD	Pathir	4	8	20	4 1/2 REG	4 1/2 REG	<input type="checkbox"/>	
DC	DC Double	NM-007	NMDC	Datel	3	8	31.24	6 5/8 REG	6 5/8 REG	<input checked="" type="checkbox"/>	
Stabiliz	Double Pin	STB1	STAB-IB	Datel	3	8 1/2	5	4 1/2 REG	4 1/2 REG	<input checked="" type="checkbox"/>	
X-Over	Double Pin	XO1	DPXD	OTHEI	3	8.5	2	4 1/2 REG	4 1/2 IF	<input checked="" type="checkbox"/>	
*										<input type="checkbox"/>	

Start WINSRVII.DOC - ... WinSURV II - Daily... 11:06 AM

**Figure 9:** Tool Inventory Screen (TOOL LIST)

The TOOL LIST folder allows the user to maintain an inventory of tools, and to track which tools are on site or compose a particular bottom hole assembly. It can be used to efficiently create a BHA by eliminating the need to reenter all of the tool specifications each time a tool is used.

Remember that you can 'Copy & Paste' Tool Lists from one job to another from the 'job tree' on the start up screen.

A Shipping Ticket may be generated for tools sent away from the rig location, and a printout of Tools On Location is available by choosing **Reports>Report Meister** from the menu bar.

Once the Tool List has been established, there are various ways to view the information through the use of the radio buttons at the top of the screen. You may view ALL TOOLS in the inventory or select a particular Tool Group from a drop down list. To see only bits, for example, check the



SELECT TOOL button and click on the drop down control to select BITS from the list. The Tool List display may be further modified to show only the tools marked ON SITE by selecting the appropriate button in the VIEW OPTIONS area. Individual items may be edited by selecting the field that you want to change.

To build the Tool Inventory, items may be entered directly in the spreadsheet. The table is identical to that found in Inventory Management for office users, and the user is referred to that section of the manual for a thorough discussion of the data entry procedure. If the office staff has provided a floppy disk with the Tool Inventory from the initial job loadout, much time can be saved by Appending the Job to load the tool table. (**Note:** This procedure should be the first task performed upon starting a job before any other data is entered since you cannot Append if an identical JOB NUMBER already exists in the database.)

## CREATING A SHIPPING TICKET

Press the SHIPPING button in the upper right corner to access the screen shown in Figure 10.

**Shipping Ticket - Double Click to Add new Addresses**

Shipping #: 00004    Address: ☐ Addresses ☐ Jobs    Print Ticket    Address: ☐ Addresses ☐ Jobs

DATE: 2000-02-29

From: Example Job    Ship To: PERFORMANCE DRILLING

Company: PDT    Address: 2000 Oilfield Parkway

Lease/Well: Any well none    City: Houston

Location: Anywhere    State: TX

Rig: PDT    Country: USA

Sender: Randy Righard    Contact: Steve Shopshire

**Comment** Motor and Jars sent in for service due to operating hours

00004

TOOLS TO SEND	
TOOL GROUP	SERIAL #
Motors	Motor 002
+	

TOOLS ON SITE		
Tool Group	Serial Number	Descrip
DC	NM-007	NMDC
Jars	Jar1	JAR
Motors	Motor 001	Motor
Motors	Motor 005	Motor
MWD	MWD1	MWD
Stabilizers	STB1	STAB-E
X-Overs	XO1	DPXO

**Figure 10:** Shipping Ticket Set Up Screen (TOOL LIST: SHIPPING)

To create a Shipping Ticket for the tools to be returned, they must be entered in the TOOL LIST and checked ON SITE so that they will appear in the TOOLS ON SITE list at the lower right corner of the screen. Select the tools to be sent in by clicking on the left border of the

appropriate row to highlight it. Hold down the <CTRL> key to select more than one item. Click the '◀' (left arrow) button in the middle of the screen to move the selected items to the TOOLS TO SEND list. (In actuality, the items remain in the Tool List, but the ON SITE checkmark is cleared to indicate that they are no longer at the rig location). The example in Figure 10 shows that Motor 002 has already been moved and Jar1 has been selected to be moved. An item may be transferred back if you make a mistake by selecting it and clicking the '▶' (right arrow) button; it will be checked ON SITE once again in the Tool List.

When entering this screen, the last Shipping Ticket # that was created is displayed. (If it is the first shipment of a job, the upper part of the screen will be blank). Click the '+' (plus sign) symbol on the edit bar to increment the Shipping Ticket # to generate a new ticket. You may view previous tickets by utilizing the arrow buttons on the edit bar to move through the shipping archive.

Set the date of the shipment by clicking the DATE drop down control at the upper left and double-clicking on the desired date from the calendar.

The Header information occupies the upper part of the screen, indicating FROM and TO where the tools are to be shipped. The current Job is automatically entered in the FROM section with the data from the JOB INFORMATION table. Radio buttons on each side provide an option to choose from the list of Jobs in the database or from an address book that you can create. To add or edit an address, select the ADDRESSES button on either side, and double click in the color highlighted first text box, which opens a dialog window. Use the edit bar to add an address. The header information for either Job or Address may be temporarily modified in the text boxes on the screen for the purpose of printing a Shipping Ticket; however, such changes are not recorded in the Address book or Job Information files. Press PRINT TICKET to preview the Shipping Ticket.

Click on the 'X' at the far top right of the screen to close the Shipping Ticket and return to the Tool List.

## BOTTOM HOLE ASSEMBLY INFORMATION

WinSURV II - Daily Report & BHA (Version 3.0.257), Performance Drilling Technology, Inc. © 1993-2004

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**JOB INFO** **TOOL LIST** **BHA INFO** **BHA ITEMS** **DAILY** **DAILY ITEMS**

**Bottom Hole Assemblies**

BHA	General Description
1	Rotary Steerable
2	Drill Out Assembly
3	Slick Steerable Assembly
4	Slick Steerable Assembly

**Days BHA Ran**

Date	Days BHA Ran
20-Nov-03	
21-Nov-03	
22-Nov-03	

**Import Surveys** **Current BHA#** 2 of 4

**PUMP INFO** **HYDRAULICS**

**REFRESH LIST**

**SUMMARY** **BIT DATA** **MOTOR DATA** **BHA COMMENTS**

**BIT DATA**

Bit Serial # MP5438 Bit Description 7-1/2" FDT W 3x24

OD 7.5 Length 0.87 Connection 4 1/2 REG

IADC Code 117 No. of Jets 3 Jet Sizes 24.0 24.0 24.0

Type Bit ROCK Bearing Type SEALED BEARINGS TFA 1.325

**IADC DULL BIT CODE**

CUTTING STRUCTURE				B	G	REMARKS	
Inner Row	Outer Row	Dull Char	Location	Bearing Seals	Gage	Other Dull Char	Reason Pulled
2	2	SS	A	E			BHA

JOE NUMBER: Example Job BHA # 2 of 4 Date: 02-Dec-2003 of 33 Rec'd Ship #

**Figure 11: Bottom Hole Assembly Information (BHA INFO⇒BIT DATA)**

The tracking of bottom hole assembly information is one of the core features of WinSURV II. There is no limit to the number of BHA's that may be entered. By convention, a BHA is considered to be different if you have changed any element of the BHA in a trip, and a new BHA number should be assigned. For instance, if only the bit is changed, even if it is the same type of bit as the previous run, the serial number has changed, you have incurred a trip, and therefore it is considered as another BHA. Fortunately, you won't have to re-enter all of the BHA items in such a scenario, since WinSURV II allows the user to copy one BHA to another. This is discussed under BHA ITEMS.

The upper third of the BHA INFO screen displays a list of all of the Bottom Hole Assemblies by number and a short identifying description. To the right of the list the days on which the selected BHA was run are shown. These are dates corresponding to daily reports for which the selected BHA number was included. You may select a date from this list and go to review DAILY information for that BHA and date.

### Selecting a BHA or Date

Click on the row of the BHA or the date that you want to look at; the row will be highlighted and the '►' symbol will appear at the far left of the row. A text box to the right reminds you which BHA is currently selected. As you move through the list selecting different BHA's, all of the rows may remain highlighted; click on REFRESH LIST to clear all selections.

### Adding a BHA

Click on the empty row at the bottom of the spreadsheet (denoted by the '\*' to the left of the row) and enter the BHA number, and the description of the BHA. It is also possible to add a BHA through the Copy BHA feature under BHA ITEMS. One or more BHA's may be deleted by selecting them and pressing the <Delete> key on the keyboard. As always, be certain of your intentions before deleting.

The lower two thirds of the screen display the contents of the subfolders (BIT DATA in the example shown above). The SUMMARY subfolder is similar to the JOB SUMMARY discussed previously, providing a written summary and graphic display of drilling activity for the selected BHA. Press the CALCULATE button to view data for the selected BHA.

The top two rows of BIT DATA, highlighted in yellow, display information entered on the BHA ITEMS spreadsheet. The Bit Type and Bearing Type are chosen from drop down lists. The TFA is calculated automatically once Jet sizes have been entered. At the completion of the trip, the IADC Dull Bit Code may be entered. MOTOR DATA entry is straightforward. You are not limited in the length of your remarks under BHA COMMENTS – the reports will expand to accommodate the entry.

### Import Surveys

This button in the upper right hand corner of the screen allows the user to import a .SAY survey file from the WinSERVE Survey program to be included as part of the Slide Report for BHA. WinSURV II interpolates the survey file to calculate inclination, azimuth and DLS at each end depth of the slide report. (The interpolated surveys will also be filled into the Daily Items pages). The .SAY file must first be *exported* from WinSERVE before it can be *imported* into WinSURV II. Refer to the WinSERVE documentation if you are unsure how this is done. The file must be imported for each BHA independently. You may decide to repeat the export/import procedure at the end of each trip, or if you need only submit the slide sheets at the completion of the job, export the file once and then import for each BHA in turn.

### Hydraulics

Press this button to go to the WinSURV II Hydraulics program module to perform hydraulics calculations for the selected BHA. A complete discussion of this topic may be found in a separate section after the Daily Report.

## ENTERING BHA ITEMS

WISURV III - Daily Report & BHA (Version 3.0.257), Performance Drilling Technology, Inc. © 1993-2004

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JOB INFO TOOL LIST BHA INFO **BHA ITEMS** DAILY DAILY ITEMS

BHA # 4 of 4 Slick Steerable Assembly Import Surveys HYDRAULICS COPY BHA

Item No	Tool Group	Tool Type	Serial Number	Description	O.D.	I.D.	Length	Top Connection
1	Bits	Bi-Center	2016148	7-1/2"x 8-1/2" CSD344	8.5	2.5	1.54	4 1/2 REG
2	Motors	Steerable Slic	625-62397-24	6-1/4" Slick Housing Steerab	6.25		26.72	4 1/2 XH
3	X-Overs	Pin Down	NIR-3207	Float Sub	6.25	2.8125	2.55	4 1/2 XH
4	DC	DC Pin Down	62-12-4999A	6-1/4" Non-Mag Pony Collar	6.125	2.875	13.21	4 1/2 XH
5	Stabilizers	Integral Pin Dr	15885	7" IB Non-Mag Stabilizer	6.25	8.1250	6.27	4 1/2 XH
6	X-Overs	Pin Down	GWL-3450	Non-Mag XO Sub	6.25	2.25	2.06	3 1/2 IF
7	MWD	Double Pin	IMP-2112	Schlumberger IMPulse	4.75	2.25	34.29	3 1/2 IF
8	MWD	Pin Up	VPWD-056	Schlumberger PWD	4.75	3.125	14.94	3 1/2 IF
9	MWD	Double Box	ADN-112	Schlumberger ADN	4.75	3.5	23.29	3 1/2 IF
10	DC	DC Pin Down	46-30-7606	4-3/4" Non-Mag Drill Collar	4.75	2.5	29.13	3 1/2 IF
11	X-Overs	Pin Down	TT-6589	XO Sub	4.75	2.25	2.60	HT38
12	HWDP	HWDP	HWDP-2.375-	4" 6 Jts. Spiral HWDP	4	2.375	182.71	HT38
13	Jars	Standard Pict	3713	Drilling Jars	4.563	2.25	29.18	HT38
14	HWDP	HWDP	HWDP-2.375-	4" 23 Jts. Spiral HWDP	4	2.375	689.05	HT38
15	Drill Pipe	DP	DP-3.34-S-135	4" 237 Jts. Drill Pipe	4	3.34	7402.96	HT38
16	X-Overs	Pin Down	TT 65-86	XO Sub	6.25	2.5	2.75	4 1/2 IF
17							.00	

JOB NUMBER: Example Job BHA # 4 of 4 Date: 02-Dec-2003 Rec'd Ship #

**Figure 12: BHA Item Entry Screen (BHA ITEMS)**

The BHA ITEMS screen provides the means to document and track bottom hole assembly information. At the top of the screen a text box indicates which BHA is currently selected. The arrow buttons to the right of the text box may be used to move up or down through the BHA list to view or edit information. A graphic representation of the BHA is displayed at the right. The option to Import Surveys or load the Hydraulics program module is provided, as has been previously seen and discussed under BHA INFO.

The COPY BHA button provides a very convenient timesaving feature that allows identical or similar BHA's to be built quickly with minimum redundant typing. Simply select the BHA that you want to copy and click on the button. The program will prompt you to enter the number of the BHA to create. The BHA list under BHA INFO will be updated automatically (note, however that the *description* is always copied from the preceding assembly and may need to be edited). Select an item that needs to be deleted by clicking on the appropriate row to highlight it; then press the <DELETE> key. To insert an item, select the row below which the new item will

appear and press the <INSERT> key. To edit an individual item, click directly on the field that you want to change or <TAB> through the row.

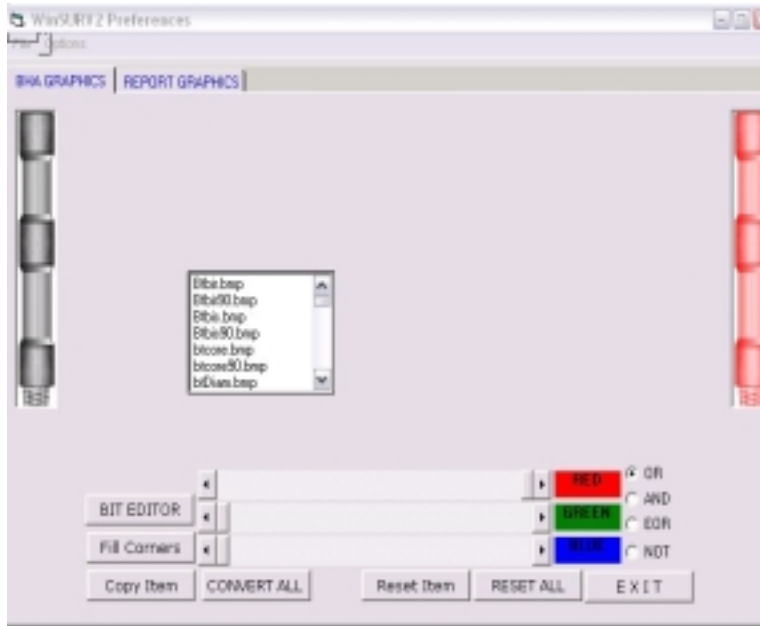
Entering data is straightforward –fill in the spreadsheet, using the <TAB> key to advance to the next column. To add a new item to the list click in the ITEM NO column on the empty row at the bottom denoted by a ‘\*’ and the next sequential number will automatically appear. The TOOL GROUP is chosen from a drop down list. TOOL TYPE selection is also limited to a drop down list; a more appropriate name for this field might be ‘picture type’, because this field determines the type of picture the program will display in the diagram on the right.

The next column is for the SERIAL NUMBER. If all of the serial numbers have previously been entered into the Tool List Inventory, and marked as ON SITE, then the drop down box of the SERIAL NUMBER will list all of the numbers for the given TOOL GROUP as entered in that column, e.g., bits, motors, MWD, etc. Select the serial number of the tool to be run; the rest of the information will automatically be filled in based on the information contained in the Tool List. If you have not utilized the Tool List Inventory, the serial numbers and additional descriptive information must be filled in by hand. In such cases it is recommended to add the item to the Tool List Inventory: double click on the drop down button in the SERIAL NUMBER field and enter the additional data on the inventory table – it is automatically copied to the BHA ITEMS list (conversely, data entered on the BHA ITEMS spreadsheet is not transferable to the Tool List Inventory). The OD and ID diameters may be entered as decimal numbers or fractions (be sure to leave a space between the whole number and the fraction). Tool joint connections are selected from a drop down box. (Note that WinSURV II does *not* check inputs for physical compatibility – it is the responsibility of the user to ensure that the connections as entered make sense “on the rig floor”).

Once the serial number has been selected and you have tabbed to the next column, a picture of the item will appear at the top of the BHA graphic. Continue to add additional items by clicking in the ITEM NO column beneath the previous entry to quickly build up your Bottom Hole Assembly.

WinSURV II employs a “drag and drop” feature to make rearranging the elements of the BHA a simple task. Click on the picture of the item to be moved and drag it to a different location by holding down the left mouse button. Place the picture over the tool joint where it is to be inserted and drop it by releasing the mouse button. Sometimes it can be tricky to accomplish the move, particularly for longer BHA’s in which the pictures are of a reduced size. Best results are obtained by selecting the item toward the upper left corner of the picture. Be patient and you will eventually get a feel for an effective technique. The spreadsheet list automatically updates to reflect the changed position of the item.

## Changing the Color of a BHA Picture



WinSURV II offers a little “eye candy” for users of color printers that allows you to customize the look of the BHA by changing the picture colors of one or all of the BHA items (to promote company colors or more readily identify particular items, for example).

**Figure 13:** *Changing BHA Item Color*

Select **File>>Preferences>>BHA Graphics** on the main menu at the top left of the screen, then scroll through the list of bitmap files to select an item, or select the item directly from the BHA diagram by right clicking with the mouse cursor over the BHA picture you want to change. This will invoke the BHA PICTURE MANAGER and bring up the current picture ready for editing.

The default color for all items is made up of a palette of gray shades. Changing the color of an item is a matter of adjusting the Red, Green and Blue components by means of the horizontal sliders at the bottom of the screen. The 4 radio buttons to the right (OR, AND, EOR and NOT) provide ways of manipulating the color pixels. Experiment to see the effect on the picture. Using the OR command is generally the cleanest way to change the color. A picture may be further modified using MSPAINT by clicking on BIT EDITOR.

### Function of the Picture Manager Buttons

- |               |  |
|---------------|--|
| • RESET ITEM  | Copies the default gray color picture for current item.  |
| • RESET ALL   | Replaces <u>all</u> current pictures in the user bin with the default gray pictures.                     |
| • COPY ITEM   | Copies the colored item on the right hand side of the screen into the user bin.                          |
| • CONVERT ALL | Converts <u>all</u> pictures in the user bin to the color. This process can require a couple of minutes. |



- BIT EDITOR                      Loads the currently selected picture into MSPAINT where the user may edit and save it.
- FILL CORNERS                Click on this button, then click in the colored areas that you want white. It flood fills the areas with white.
- EXIT                              Exits the Picture Manager and returns to the BHA program.

A word of caution must be given about changing colors. Two subdirectories found in the WinSURV II directory are named BHASTANDARD and BHASTUFF. The BHASTANDARD directory contains all of the default grayscale graphics; BHASTUFF contains duplicate copies of these bitmap files in which any changes made to the pictures are stored. These files are shared by all jobs in the database, and are not attached to specific jobs as part of saving to floppy disk, or backing up to the hard drive. The effect of the RESET ITEM and RESET ALL commands is to overwrite the modified picture in BHASTUFF, replacing it with the default. This change will be seen *for all jobs listed* on the startup screen. This is also true for changes made using the COPY ITEM and CONVERT ALL commands.

Therefore, if you have worked to create a preferred custom color palette for your BHA's, the solution is to copy all the files under BHASTUFF either to disk or to another directory that you've created on your hard drive. Then your custom pictures will always be available to you by copying these backup files over the contents of the BHASTUFF directory. Do **NOT** change the filenames, however, or WinSURV II will not be able to find the files from its standard drop down menus. It is possible to add or modify pictures that can be included in these menus. Contact PDT for more information.

## HYDRAULICS

WinSURV II Hydraulics Module - Job ID = ExampleJob BHA #4

**Tables** **General Input** **Pressure Drops** **Casing Info** **Annular Geometry**

**FLOW AND PRESSURE**

Pressure (PSI)  ☒ SOLVE FLOW

Flow (GPM)  ☐ SOLVE PRESSURE

Depth (FT)  ☐ SOLVE FOR TFA

Hole Diam. (In.)

**MUD PROPERTIES**

Wt (PPG)

PV (CP)

Yield PT.

**Hydraulic Summary**

ITEM	Value	Units
Surface Drop	42.8	PSI
Pipe Drop	2526.6	PSI
Mud Drop	.0	PSI
Motor Drop	.0	PSI
Bit Drop	255.8	PSI
BHHP	59.52	HHP
HSI	1.11	BHHP/in*
Noz Velocity	141.52	Ft/sec
ECD	14.54	PPG
Impact Force	413.8	Lbs
Annular Drop	174.8	PSI

**JETS in 1/32nds**

# JETS  TFA

MAX. HEP 263 (HEP @ 1.11 HSI) TFA @ 141.52 (GPM)

MAX. IMPACT 711 (Lbs) @ 1.11 HSI TFA @ 141.52 (GPM)

**Optimize Bit**

☒ Do Optimization

**BHA Details and Pressure Drops**

Description Type	I.D. In.	Length Ft	Inner Drop PSI	Annular Drop PSI	Total Drop PSI	D =
7-1/2"x 8-1/2" CSD344	0.080	1.54	255.77	0.00	255.77	
6-1/4" Slick Housing Steerable	0.080	26.72	.00	3.09	3.09	
7.875 Lbs. 4.9 Chances Motor	2.813	2.55	1.04	0.29	1.34	
6-1/4" Non-Mag Pony Collar	2.875	13.21	4.86	1.30	6.16	
7" ID Non-Mag Stabilizer	2.813	6.27	2.57	0.72	3.29	
Non-Mag X/O Sub	2.250	2.06	2.50	0.24	2.73	

**CONTROLS**

Power Law:

**Calculate**

**PRINT**

**Goto BHA's**

**Figure 14:** Hydraulics Module Main Screen (Hydraulics⇒General Input)

The WinSURV II Hydraulics Module is integrated with the BHA program so as to minimize the amount of redundant data input required, and maximize the quality of the reported data. The user may choose one of three available models to perform the hydraulics calculations: Power Law, Bingham Plastic, or Newtonian. The selection is made from a drop down box located in the lower right corner of the screen. The Bingham Plastic model is preferred for oil base muds and generally yields higher values of pressure than the Power Law model, which should be used for water-base mud. The Newtonian model is typically used when pumping cement slurries. The units identifying the various parameters that are involved in the calculations are those as specified under JOB INFO⇒MEASUREMENT UNITS. Selected units may reflect whatever mix you desire: for example, ID's can be in millimeters and OD's in inches. Input values are assumed to be correct for the units selected; if the units are changed *after* data is entered, it is not converted. The hydraulics calculations can be made once all of the appropriate data has been entered. At the top of the screen are folder tabs that control the upper two thirds of the display. The best procedure is to begin with the **CASING INFO** tab, followed by **PRESSURE DROPS**

and finally **GENERAL INPUT**.

The BHA data required to perform the calculations are the OD, ID and length of each item. Across the lower third of the screen is a spreadsheet containing BHA details carried over from the entries made in BHA ITEMS (blue type), and the calculated pressure drops for each item (red type). The BHA details may be edited on this table if necessary, and the changes will be incorporated in BHA ITEMS. However, it is not possible to add or delete items from this screen. Press the GO TO BHA's button in the lower left corner to return to the BHA module should such editing be necessary.

By convention, drill pipe tally is not considered part of the BHA. However, for purposes of hydraulic calculations the last item of your BHA should be drill pipe because if the dimensional information of the last item is carried to the surface, an erroneous and misleading calculation may result. In fact, if the last item is a crossover, the calculation is *not* made back to the surface and reported pressure losses through the pipe are greatly underrepresented. Enter "0" length for the last drill pipe entry; the program will calculate a length based on the DEPTH entered, assuming the difference between TD and the surface. The ID's for the bit and motor should always be set to zero (and the respective pressure drops specified by the user on the PRESSURE DROP folder). The Weight calculations provide useful additional information but are not relevant to the basic hydraulic equations. The Wet or buoyant weight is obtained by applying a buoyancy factor specific to the mud density.

The first folder to the left, TABLES, provides a summary of typical mud properties. The tables are strictly for reference and have no bearing on the calculation; thus no action by the user is required.

The PRESSURE DROPS folder provides a list of the four standard API cases to determine the pressure drop attributed to the surface equipment configuration. Choose the case that most closely approximates your situation and enter the number in the text box at the upper left. Enter values for the pressure drops across the MWD tool and motor if they are present in the current BHA. The Motor % Loss represents the percentage of the mud flow that is diverted to the annulus to cool the motor bearings. Be sure to set these values to zero if these tools are not in the string; WinSURV II does not do it automatically and stray values will yield irrelevant results.

Under the CASING INFO folder the user enters the information on a spreadsheet describing the casing profile for the well. Click on the drop down button in the SIZE column to select from a table of standard casing sizes; the weight, OD and ID will be filled in for you. If your casing has a specification different from those listed, enter the values directly. Enter the TOP DEPTH and SET DEPTH for each casing string. Information may be added in any order – press the SORT button to rearrange the list in descending size order. A row may be deleted by selecting it and pressing the <DELETE> key. Casing string information may also be entered by clicking the CASING INFO button at the bottom of the JOB INFO⇒BASIC JOB DATA page.

The ANNULAR GEOMETRY folder displays a table of annular pressure drops across each item of the BHA, through the casing string to the surface after a calculation is performed. Annular fluid velocities and the nature of flow (turbulent or laminar) are also indicated.

The GENERAL INPUT folder is where variable data is entered (as contrasted to 'fixed data' such as casing information) and the user may examine different scenarios with regard to maximum standpipe pressure, flow rates, mud properties and jet sizes and the resultant effects on the hydraulics calculations. Once all of the data has been entered, whenever a parameter is changed the entire hydraulics is instantly recalculated.

Mud Properties, total Depth and Hole Diameter are entered in text boxes in the upper right corner of the screen. Located at the top center are three radio buttons to select a calculation mode and the variable to be solved for:

- **SOLVE FLOW** - Enter a maximum operating standpipe pressure for the rig. The program then iterates the flow rate until the solution is found for the given pressure.
- **SOLVE PRESSURE** – Enter the desired flow rate and the pressure is calculated based on that rate.
- **SOLVE FOR TFA** – Enter values for both the pressure and flow rate and the program will determine the required jet sizes to meet those conditions. This solution method is not exact, and very often the flow rate is altered as well; however, it can be a useful 'first pass' solution to get a general idea of the jet configuration needed. Then you may switch to SOLVE FLOW mode to fine tune your jet selection.

In the center of the screen is the area to select the number of jets and their size. Adjusting the size of jets used in bits is a basic component of hydraulics calculations. In the text box labeled # JETS you may select up to ten jets. When you <TAB> off the box, a vertical slide bar with the corresponding size is displayed for each jet. The slide bar supports standard jet sizes from 8/32nds to 32/32nds. If your choice of units presents jets in their millimeter designations, the sizes displayed are rounded off to the nearest integer. The TFA is automatically calculated and displayed. As you simply adjust the jet sizes, all of the calculations are instantly updated to reflect the change, thus facilitating a quick decision on your final jet selection.

At the far right center of the screen is an option to optimize bit hydraulics. Place a checkmark in the box DO OPTIMIZATION and two curves are generated for a given maximum operating pressure. The larger, blue curve represents flow rate vs. Hydraulic Impact; the smaller curve in red shows flow rate vs. Hydraulic Horsepower (HHP). The maximum values of these parameters are displayed below the jet controller. Although these curves are not always useful, very often when drilling with a rock bit in an 8½-inch hole or larger, it is desirable to optimize one or the other. The black vertical line indicates where you intersect the curves at the current flow rate. By adjusting jet sizes you can easily find the optimal flow rate for your application as the black

line moves instantly reflecting your changes. If you change the Pressure, pressing the Optimize Bit button erases the graph and recalculates the curves; clicking within the picture frame preserves the previous graph while generating new curves so that you may compare multiple scenarios.

At the left center of the screen a tabular summary of the hydraulic calculations is displayed. In the lower left corner is the area labeled CONTROLS, where the user selects the calculation method. When solving for FLOW or PRESSURE, calculations are instantly updated for any parameter change; however, in SOLVE FOR TFA mode, you must press the CALCULATE button to view the results. Click GO TO BHA's to return to the BHA program. Click PRINT to open the Custom Preview Window and to print the report.

The WinSURV II is an efficient, compact design in which all of the information discussed in this topic fits on a single page, including a diagram of the BHA. With nearly all other programs the hydraulic data is spread across several pages, making the analysis a clumsy process. Although there might be more information than is strictly necessary, with WinSURV II all of the information you need is right at your fingertips. An example of the Hydraulics Report may be found in the Appendix.

## THE DAILY REPORT

Of all the programs a directional driller uses on location, the daily report probably consumes most of his time. Because WinSURV II is built upon a relational database structure rather than a tedious spreadsheet format to manage the daily information, it successfully minimizes the burden of data entry for information that does not vary much day to day, while at the same time is capable of easily tracking data that changes as a function of time, such as mud properties and drilling parameters. It provides a simple user interface to add successive data and quickly move from one day to another. Supplemental tasks such as cost tracking are incorporated into the same structure, streamlining file management responsibilities and reducing the risk of lost data. Concise, complete and professional summary reports may be generated with the click of the mouse.

WinSURV II - Daily Report & BHA (Version 3.0.257), Performance Drilling Technology, Inc. © 1998-2004

File Other Programs Reports Help

JOB INFO TOOL LIST BHA INFO BHA ITEMS **DAILY** DAILY ITEMS

Date: 12/02/03 Report Time: 2400

**Date/Info** Comments **DAILY SUMMARY** Costs

Lead Directional DD #1

Second Directional DD #2

Directional Co. Directional Company

Mud Company Mud Company

Company Man Operator Rep

MWD Engineer1 MWD #1

MWD Engineer2 MWD #2

Inclination In 20.17 Inclination Out 20.17

Azimuth In 132.17 Azimuth Out 132.17

Copy Previous Update Record

December 2003

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

01/16/04 12/02/03

Geologist

JOB NUMBER: Example Job BHA # 3 of 4 Date: 02-Dec-2003 Rec'd Ship #

**Figure 15:** Daily Report Information Screen. (DAILY⇒DATE/INFO)

The **DAILY** folder contains four sub-folders: **Date/Info, Comments, Daily Summary** and **Costs**.

The **DATE/INFO** folder displays a calendar that highlights all of the days of the current job for which data has been entered, defaulting to the last such day. The slide bar below the calendar allows the user to scroll through other months. For a new job the calendar defaults to the current month and day. At the left of the screen are text boxes to enter personnel information associated with the selected date. To select a day simply click on the date, which will then appear in the text box at the top of the screen. Click on the drop down button to view a table summarizing this information for the entire job. (You may also move to a different date by selecting it from this table). To add a date, click on it and you will be prompted to confirm the action to add that day to your daily reports. If you answer 'YES', the information on the left side of the screen will be erased. If you want to copy the previous record's info, click on the COPY PREVIOUS button. The Inclination and Azimuth IN for the new date are posted from the OUT data of that record. Edit the information that may have changed, and then click on the UPDATE RECORD button to save your changes. (Especially when beginning a new job, remember to initialize the report by adding the date before entering DAILY ITEMS).

Right-click on a date with data and a pop up menu appears. Choose VIEW to change the calendar to display one, two or three months. You may go directly to the DAILY ITEMS from this menu or delete the day and all of its records.

The **COMMENTS** folder provides the opportunity to include comments that will appear on the Daily Report. The length of your comment is not limited – the report will expand to accommodate however much you wish to write.

The **DAILY SUMMARY** provides a text summary of the same information previously described in JOB SUMMARY or BHA SUMMARY, except in this case the information is summarized over a 24 hour period ending at the time specified in the REPORT TIME text box at the upper right of the screen. If, for instance, the report time is set at 0600, then the data would be summarized over the 24 hour period between 0600 yesterday and 0600 today. (A message box on the report clearly indicates the time period to avoid confusion). This is also where the user decides on what time basis the Daily Report will be made. This REPORT TIME, however, is not considered in the calculation of the daily costs, which are always accrued from 0000 to 2400 hours of the calendar day.

If you want a Report Time other than 2400, make sure that you have a Daily Activity Item entry for that time each day (even if you have to 'break up' an extended period of drilling, for instance) to have a complete list of activities and proper calculation of hours and depth drilled on your report. If there is no line entry for the specified Report Time, the program cannot 'guess' what may be happening, and will stop at the next earlier time entry.



## DAILY COST ENTRY

Daily cost tracking is done through the **COST** folder, shown in Figure 16. The lower half of the screen shows the Daily Cost Itemization table where the user enters the charges incurred for the selected day. (The date must be selected from the DATA/INFO calendar, not from the drop down table). Each cost item is allotted two lines, and the cell assignments are as indicated in the top header lines. The GROUP and ITEM IDENTIFIER fields (highlighted in red) are known as primary or index key fields: for the record to be accepted both must contain an entry. Click in the GROUP field to make a selection from a drop down list of various cost groups (this table may be edited for user preferences by double-clicking on the arrow).

The ITEM IDENTIFIER is a unique tag that may take whatever form the user decides, e.g., it could be a serial number, shipping ticket number, date or simply a label of a couple words. The important point is that the field cannot be left blank – you will be besieged by error messages. The Cost Group ‘DAY RATE’ is a special case. Since it is the most common type of charge, if you <TAB> out, the date is automatically filled in as the Item Identifier, though it may still be edited. The IDENTIFIER DESCRIPTION field on the second line is optional, though you may choose to provide further information about the nature of the charge or an elaboration of the Item Identifier. However, the Item Identifier and Identifier Description are the two fields utilized to generate the Field Invoice Summary Report. Cost items for which these fields are *exactly alike* from day to day in the course of the job are condensed to a single line entry. If you intend to make use of this report, it is absolutely necessary that you edit the automatic date entry in the Item Identifier field.

The CHARGE METHOD offers a drop down list to identify the unit basis of charge, whether it is by hour, day, job, item, etc. This is only a label to ensure clarity, and is left to the user’s discretion.

Actual monetary totals are calculated based upon unit quantity (QTY. Units) and Price per unit, subject to the specified Maximum and Minimum charges under Price Structure for the given entry. The calculated price is compared to these values: if it is less than the minimum, the minimum value is used, or if it exceeds the maximum, the maximum value is entered. If these values are set equal to zero the calculated price is entered directly. A credit is entered as a negative charge in Price/Unit and is displayed in parentheses. The Total Day Cost is displayed at the bottom of the page. The example screenshot illustrates several of these points.

The upper third of the screen displays a summary of circulating, below rotary and drilling hours broken down three ways: cumulative job up to the selected date, total per BHA and currently selected date. The hours are not automatically updated upon entering the screen; you must press

the GET HOURS button to retrieve the information for the selected date and BHA. Note that the choice of BHA displayed is not linked to the date selection. If you are interested in the BHA pertaining to the date, you must go to BHA INFO and select the proper BHA yourself. However, BHA hours are always total hours, regardless of the date selection.

WinDRILL II - Daily Report & BHA (Version 3.0.272) Performance Drilling Technology, Inc. © 1990-2004

File Other Programs Reports Help

JOB INFO TOOL LIST BHA INFO BHA ITEMS **DAILY** DAILY ITEMS

Date 12-Nov-2003 11/12/2003 Report Time 2400

**Date/Info** **Comments** **+DAILY SUMMARY** **COSTS**

**GET HOURS** Job thru 11/12/2003 For BHA # 3 11/12/2003

Circulating Hours	119.00	83.00	13.50
Below Rotary Hours	203.25	104.00	24.00
Drilling Hours	106.50	64.50	11.50

**Daily Cost Itemization**

GROUP DESCRIPTION	CHARGE STRATEGY	PRICE STRUCTURE	NOTES
GROUP	ITEM IDENTIFIER	CHARGE METHOD	
	IDENTIFIER DESCRIPTION	QTY. Units	Price/Unit
CREDIT	Discount - Use of Gyro	ITEM	
	\$100 discount per day	1	(\$100.00)
DAY	Flat Day Rate - Motors less	DAY	
DATE		1	\$3,800.00
PERSCOT	Directional Driller Chg	DAY	
	Flat Rate Gulf Coast - 2nd Directional	2	\$600.00

Copy Previous Day's Costs

**TOTAL DAY COST** **\$4,900.00**

JOB NUMBER: 2101003359 BHA # 3 of 3 Date: 12-Nov-2003 Rec'd Slip #

**Figure 16: Daily Cost Entry Screen (DAILY⇒COST)**

Since many cost items are routinely the same from day to day, you can save a lot of time by using the COPY PREVIOUS DAY'S COST function. Once you have added a report for a new day, simply go to the Cost folder and click the button, then add or edit items as necessary.

The user may refer back to the JOB INFO⇒JOB COSTING tab to review the costs for the entire job. Note that on that screen the jobs are not broken out by date, and it is not possible to edit any information.

## DAILY ITEMS

WinSURV II - Daily Report & BHA (Version 3.0.257), Performance Drilling Technology, Inc. © 1993-2004  
File Other Programs Reports Help

**JOB INFO** **TOOL LIST** **BHA INFO** **BHA ITEMS** **DAILY** **DAILY ITEMS**

24 Nov 2003

QUICK SCAN

BHA #	From Time	End Time	Activity Code	Comment	Start Depth	End Depth	WOB	TFD	ROP	RPM	Surface Torque	FLOW RATE
3	00:00	00:15	Other	Flow Check & ...	15816	15816			00			282
3	00:15	01:00	Drilling	Rotate	15816	15826	10		13.33	40	5000	282
3	01:00	01:10	Survey & ...	Survey	15826	15826			00			282
3	01:10	04:00	Drilling	Rotate	15826	15880	10		19.05	40	5000	282
3	04:00	04:15	Circulating	Work On Pumps	15880	15880			00			282
3	04:15	05:35	Drilling	Rotate	15880	15911	10		23.25	40	3000	282
3	05:35	05:55	Circulating	Took Slow Pump	15911	15911	10		00			282
3	05:55	06:05	Survey & ...	Connection	15911	15911			00			282
3	06:05	06:30	Drilling	Rotate	15911	15917	15		14.40	40	3000	282
3	06:30	06:35	Survey & ...	Survey	15917	15917			00			282
3	06:35	08:40	Drilling	Rotate	15917	15950	15		15.84	40	3000	282
3	08:40	12:30	Sliding	Slide	15950	15997	15	150	12.26			305
3	12:30	15:00	Circulating	Pull Off Bottom & ...	15997	15997			00			305
3	15:00	15:15	Other	Flow Check	15997	15997			00			305
3	15:15	20:10	Circulating	Raise Mud Wt. ...	15997	15997			00			305
3	20:10	20:20	Other	Flow Check	15997	15997			00			305
3	20:20	20:30	Other	Function Test BOP	15997	15997			00			305
3	20:30	20:45	Circulating	Took Slow Pump	15997	15997			00			305
3	20:45	22:00	Sliding	Slide	15997	16008	10	150	8.80			305
3	22:00	22:20	Other	Flow Check & ...	16008	16008			00			305

JOB NUMBER: Example Job BHA # 4 of 4 Date: 24-Nov-2003 Rec'd Ship #

**Figure 17: Daily Items Input Screen (DAILY ITEMS)**

The DAILY ITEMS folder is where the user records the daily activity. Each day's activity should be recorded using military time (0000 to 2400) regardless of your preferred Report Time – WinSURV II will retrieve the data to create the report for the specified time. The important restriction to remember is that you must make an entry with an ending time corresponding to the Report Time to obtain a complete report – the program cannot guess what's happening if no entry exists for that time. To make an entry, click in the first column, and the BHA # and end time of the previous record are copied as the start time of the new line. If there is no BHA in the hole, enter 0 for BHA #. Press <TAB> to complete the entry and move to the next column.

The ACTIVITY CODE is selected from a drop down list of various possible activities. As a shortcut, the first nine commonly used items may be entered by simply typing the corresponding number. The next column is for a COMMENT regarding the activity.

Drilling Parameters		Mud Properties	
Start Depth:	10645	Mud Type	OIL BASE
End Depth:	10680	Mud Weight	15.5
WOB:	10	pH	0.02
ROP:	45.00667	Plastic Viscosity (PV)	33
RPM:	65	Yield Pt (YP)	10
Surface Torque:	6000	Solids	32
Stick OFF Wt:	255	Sand	0.1
Pick UP Wt:	265	Clones	25.5
Rotary Above Bottom Wt:	258	Flow Temperature	114
Flow Rate	476	Bottom Hole Temp	181
SPM	120	GPP (Stand Pipe Pres.)	0
		Mud Plugs and Additives	SARITE, DIESEL
Azimuth @ End Depth	210.1837	Tool Face Orientation	0
Inclination @ End Depth	1.663263	DLS @ End Depth	0.56909
<input type="button" value="Update"/> <input type="button" value="COPY PREVIOUS"/>		<input type="button" value="OK"/>	
Depth Interval	35	Time Interval	75

To the right of the END DEPTH column are nearly thirty columns providing detailed information about drilling parameters and mud properties. Relax! You're not expected to fill in all of that information for each and every activity.

When you <TAB> after entering the Activity Code all of this data is copied from the previous record to the current record. (and the last line of the previous day will be copied to the

new day). It is only necessary to edit the items that may have changed, for example a new mud report or a different WOB. Thus it is most advantageous to enter as much information as possible on the first entry line so that it will automatically be copied for you on the following records. The easiest way to edit an individual item is to click on the '3-Dot' button in the START DEPTH column to open the Drilling Parameters / Mud Properties form shown above, which presents all the data in a more efficient format to make your changes. After editing, press the UPDATE button to save the changes and return to the activity input screen. (The '3-Dot's are not visible while starting a new line entry, indicated by a 'pencil' icon at the far left of the table. Just click within the activity code or comment on a different line to switch modes to access the form).

Sometimes you may notice that the data was not copied while you were adding the record. This will happen if you exit the record without entering an Activity Code. Remember – it is the action of exiting the Activity Code field when you are in 'add mode' (indicated by the pencil icon in the far left column) that triggers the automatic copy process (including setting the START DEPTH of the new record as the END DEPTH of the last). If you want to copy the drilling parameter data of the previous record, press the COPY PREVIOUS button, followed by UPDATE to save. If you simply review the data without making changes, press OK to return to the activity input screen.

For software versions 276 and later, a much-appreciated enhancement now allows you to insert Activity line items! Select a line item, press the INSERT key on your keyboard, and a record will be inserted on the line above which copies the original previous record. The END TIME of the inserted line will be the average of the END TIMES of the selected line and the original previous record. In addition, if the previous record had an ROP associated with it, the start depth

of the new line will be calculated using that ROP.

The special case is when you want to “break up” the first activity line (for instance, to insert an activity code with the END TIME the same as the REPORT TIME). Select the first line, press the INSERT key, and the first record will be copied, with times and depths averaged as before for the appropriate Activity Codes.

Always be sure to check your start and end, times and depths for the selected and inserted records and edit as necessary to ensure continuity for that day’s activities.

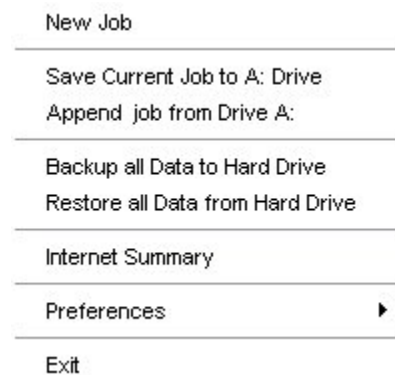
Note that the drilling parameters that will appear on the Daily Report are those from the last line of the day, regardless of the specified Report Time. In addition, the parameters that will appear on the BHA Detailed Report are those corresponding to the last entry for that BHA.

Notice that there are two fields to enter an inclination and azimuth for each activity line. You may enter these values directly, but be advised that the IMPORT SURVEYS routine discussed in BHA ITEMS will fill in these fields with values interpolated at each end depth if the file is imported for the current BHA and includes the range of depths reported for that day.

## MAIN SCREEN MENU OPTIONS

The Menu Bar is located at the top of the screen and is always accessible no matter which folder you may be working in. The Menu options are described below.

### File



The **File** submenu is shown to the left.

**New Job** returns the user to the Job Selection Screen.

**Exit** closes the WinSURV II program.

**Internet Summary** creates a summary spreadsheet of all BHA and Daily data that may then be E-mailed to the office. You may take a look at the proposed format of these sheets; however, the E-mail function is currently inactive. This feature will be incorporated into future versions of WinSURV II.

**Preferences** provides the user with the opportunity to customize the look of Reports printed in color, modify BHA graphic component colors, and insert a Logo to appear on all Reports.

The most important features from this menu are the file management functions. You will notice as you use WinSURV II that there are no ‘SAVE’ buttons in any of the folders. This is because your work is automatically saved as data is entered. The Backup is a precaution against corruption of the database structure.

When you **Backup Data to the Hard Drive**, selected tables containing BHA, Daily Items, Daily Costs, and Tool Inventory are copied into the WinSURV2 directory as a Microsoft Access database file named BACKUP.mdb. This action backs up ALL jobs in the WinSURV II database, not just the current job, since all jobs share a common table structure. The **Restore** function will work *only* if there is no duplication of Job Numbers in the current database. This can be somewhat tricky to understand. To illustrate, consider a scenario in which three jobs, appearing on the Job Selection Screen as JOB1, JOB2 and JOB3 have been backed up. As long as *any one* of these jobs remains active in the database and appears on the Job Selection Screen, you will not be able to **Restore**: the jobs must first be deleted. Any data entered since the last backup will thus be lost.

**Save Current Job** creates as a default an .mdb file with a name identical to the Job Number. Useful to transfer job data to the office or between computers, at which time you would **Append Job**. However, similar to the Backup feature, a job cannot be appended if it already exists in the database. The term “append”, in essence, means to add to the database.

## Other Programs

Provides a shortcut to the WinSERVE Survey program and allows the user to keep WinSURV II open as a background application if your computer contains enough memory. This facilitates switching back and forth as the need arises. If this interferes with the smooth operation of either program, it is advisable to close the application and open the other in the normal manner from the Windows desktop.

## REPORTS

Provides access to the variety of standard reports supported in WinSURV II. The power of the relational database engine is put to use to “crunch the numbers” and communicate a wealth of information at the click of a mouse. Examples of each report may be found in the Appendix. Choose **Report Meister** to select from the list of available options:

Daily Report

Report of Daily Activity including drilling summary, costs and personnel on location for selected date and time. (Uncheck ‘Show Costs’ if you don’t want that information to appear on the report)

Summary Report for All BHA’s

Summary of hours, footage and drilling parameters

Slide Report for BHA

Slide Report for JOB

Graphic Detail Report for BHA's

Picture of BHA without Detail

Tools On Location

Tool Utilization Report

Cost Estimation

Pre-BHA Items Report

Post Well Chart Reports

Field Invoice Summary

for all BHA's including graphics and general comment

Sliding and Drilling summation for selected BHA with interpolated WinSERVE surveys

Sliding and Drilling summation for all BHA's

Comprehensive report for selected BHA including summary of drilling parameters; bit, motor and mud data; component listing and graphic; comments

Graphic representation of selected BHA with comments

On site inventory categorized by Tool Group

Summation of drilling & below rotary hours, and footage drilled for each item; segregated by Tool Group

Total charges summed individually by Cost Group

Table of BHA components for selected BHA presented without graphics for quick printing

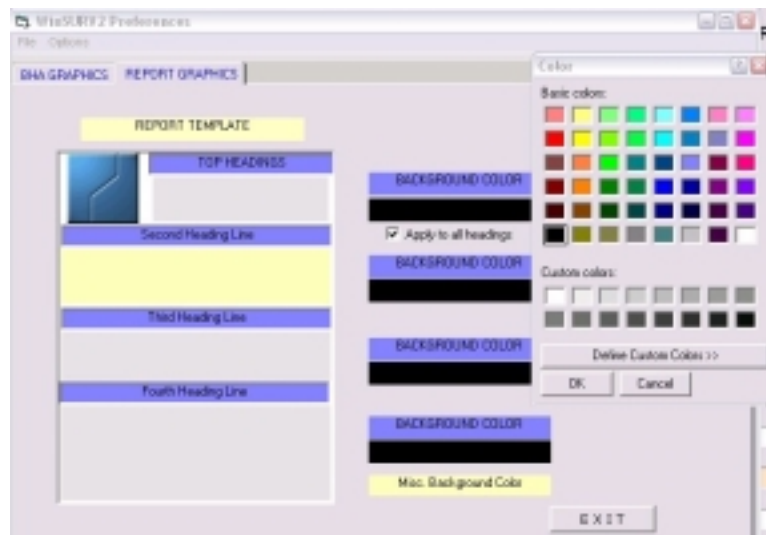
Six pages of summary data presented graphically, including Footage, ROP, and Depth per BHA; Activity histogram; depth per day; Rotate and Slide breakdown by total footage, percentage, ROP, and time.

More compact version of the Cost Estimation reports

To customize the color of the report, choose FILE>PREFERENCES>REPORT GRAPHICS.

Click within the color boxes to the right of the sample report to open the color palette (shown). Each heading may be set individually, or check 'Apply to All Headings'.

Set the LOGO by choosing FILE>PREFERENCES> SET COMPANY LOGOS. ('Directional Company' is the one you want).





## Post Well Reporting



With WinSURV II, generating Post Well Reports is simple and convenient, “one-stop shopping”. Choose REPORTS>POSTWELL REPORTING from the menu bar.

A complete set of reports may be sent to the printer with a single print command by clicking the ALL REPORTS button. If you want more than one set, click ALL REPORTS again to increment the Report Count by the total number of reports (it may take a while to load all the reports in the preview window for a long job).

Otherwise, you can check the boxes individually for complete sets of only those reports that you want to print. As you make your selections, the total number of reports to be printed is indicated in the Report Count text box. Click the PREVIEW REPORT button to open the Custom Preview Window. Note that the pages are displayed in inverse order so that they will stack correctly in the printer tray. The Daily Reports and BHA Reports folders let you select any combination of specific reports to print from a spreadsheet listing (click the ‘Selected Dates Only’ or ‘Selected BHA’s Only’ buttons to view the list). Click GENERATE REPORT to preview the selected reports. At the top of the Custom Preview Window is a menu bar. Choose **File** to access Printer Setup, to Print or to EXPORT to PDF File.