SCIENTIFIC DATA SYSTEMS, INC.

Warrior Software Version 7.0 – Standard Cased Hole

Field Operations Manual

WARRIOR SOFTWARE VERSION 7.0 STANDARD CASED HOLE

Field Operations Manual

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Introduction

Warrior software Release 7.0 is a second-generation 32-bit program. The Warrior software is a mature logging environment that stresses ease of use, wide versatility, with a true multi-tasking environment. This software can also be used from a desktop to replay, recalculate and print logs from the raw data or imported data from other systems such as LAS or LIS data. The Warrior software runs on Windows Operating Systems (Windows 2000 and Windows XP). Operators need to be familiar with Windows and logging.

The Warrior Tool Interface and Power Supply Panel is a new generation logging system. This system utilizes the USB Bus (Universal Serial Bus) along with DSP (Digital Signal Processor) technology providing the latest signal recovery technology available. This allows the PC to be upgraded independently as newer and faster PC's become available. Systems can be configured based on the services required at each site. The operator interface remains the same for each configuration, allowing the same look and feel for the operators.

The Warrior Well Logging System consists of a Tool Interface and Power Supply Panel, a computer, a printer and optional depth, line speed, line weight panel, and perforating power supply. The tool interface panel contains the necessary circuits to interface to most cased hole tools, both analog and digital. The depth encoder and line weight interfaces are built into the panel, as is the down hole tool power supply. All functions are digitally controlled from the software, with the power supply having a manual control mode. The panel incorporates data acquisition functions primary DSP based, that interface to the host computer through the industry standard Universal Serial Bus (USB). A seven port USB hub is also incorporated inside the panel allowing a single cable connection to the host computer. A second monitor may usually be attached to provide a Hoistman's or client's display.

The system supports most thermal well log plotters and a selection of color printers. An optional depth, line speed and line weight panel is available. This panel provides 12 Vdc. powered, independent depth measurement. It connects to the host computer through the USB and can be synchronized from the host depth or the host depth may be read from the depth panel. The Warrior logging system currently consists of the following components:

CPU – Laptop/Desktop
Monitor
Shooting Panel
Tool Interface and Power Supply (CP/PA/OP/SLAB)
Keyboard
Plotter
Depth, Line Speed and Line Tension Panel (optional)
UPS (optional)

It is strongly suggested that the CPU and monitor (and optionally, the interface panel) be run from an UPS with a capacity of approximately 1000 VA. Do not attempt to use an on-line type UPS with diesel generators unless the manufacturer specifically states that the product is suitable for this application. The (cheaper) switching type UPS seem to work well. Loss of data is guarded against by periodic update of the data base files, however, the use of a UPS allows the system to be shut down in an orderly manner and may also condition the line power to the system, thus eliminating problems due to a noisy power source.

Release Notes Warrior CasedHole

Release notes for Warrior Casedhole 060825

Log formats	Add Image 3D and Potato plot types for multi arm caliper array data.
Plotting	Can start XYPlot when service starts like Iplot. Extra parameters entered in Services Editor.
All logging	Generic Borehole Imaging tool module
All	Bugfix recalculation of depth-shifted data
CH Logging	Titan telemetry 24 bit raw data channel support
All Logging	Temp. Compensated XY Caliper tool; ported to Win-32.
Printing	Add calibration for Windows printers
CH Logging	Added spinner calculation program - Flowvelocity
All logging	Compatibility fix for FX1 based hardware with VIA USB host controller
All logging	Average Caliper output added to XYCal; slight clean-up.
Perforating	Use service dump for more accurate sensor offset calculations. Bug fix - Closing all from Acquisition while wizard was open could delete joplan entries.
Tool string drawing	Use service dump for more accurate sensor offset calculations.
Alarms	Alarms now can be canceled in groups - depth, depthpnl using new alarms.
All logging	Multiple gain/filter board support, new I2C system addressing enhancements
All logging	Multiple DSP board support
All logging	New I2C system addressing enhancements, support for USB44R6
All logging	New I2C system addressing enhancements
TVD Calculations	Uses new tvd library - DS points will be saved in a database instead of external file. TVD plots won't need to be saved to database, can be added to plot job later.
All logging	CNTP-313-B Probe Tool Added - New Algorithm.
Headings	Headings can have watermarks
CH Logging	Panex Spinner Flow support
Tool string drawing	User can create their own list of sensors to hide in the tool string drawing. File logsys.ini, section [ToolDiagramSkipSensors], then list sensor names 1=SENS1, 2=SENS2, etc.
Plotting	Can enter a decimal value for line thickness to fine tune curve thickness on printers with resolution >= 300
Well Objects	Casing, plugs, packers can have colors.
All logging	New device for surface acquisition
All Logging	Bug fix for data transfer
Tool Power Monitor	Bugfix tool power monitor config, inhibit. Can now declare “NoMonitor=yes” in specific services (or globally via Warrior.ini)

Release notes for Warrior Casedhole 060407

CH Logging	Hotwell PNN downlink timing improvement and biased output returns to max. pos. rail for larger neg. deflections
All logging	Nominal gains and offsets for Tvolt and Tcurr by panel type
CH Logging	Sondex PL telemetry has new channel type "flowdir2" for modified XMW using two channels for flow rate and direction
CH Logging	Fix for PIP panel PLL multipliers

Release notes for Warrior Casedhole 060321

All logging	Bug fix - Could cause "Unable to create curve" errors at log up time.
Windows printing	Can adjust resolution of Windows Printing source data via Warrior Control Panel. Lower resolution speeds up printing but can lower print quality. This setting is used in addition to the printer resolution set in the Windows printer settings.
XY Plot	Legend for curve names, Editable legend items, Uses banner for heading, Can plot constant values for reference.
Plotting	Add entry to warrior.ini in [Heading] section for "defaultbanner". If entry not there then will use title.wlb
Sondex Support	Sondex PL supports flow detection on all lines including H2S. QPS bug fix
Plotting	Can show legend for shading in log inserts
All Logging	Prohibit Panel Type change (flag setting to enable in Warrior.ini)
All Logging	Logging releases use new style device drivers
All Logging	Sondex name fix, gauge overflow fix, smoother output filename handling
All Logging	Fix resource leak - was causing misc. device record and storage errors when recording multiple passes of logs with many outputs
Perforating	New Perf Job Planner
Panex Support	Panex GR support, other updates per Panex
Cal reports	Cal reports now have a heading with database and dataset source for cals.
Printrex printing	For 820RM printers, add 820RM=1 to printrex printer section in warrior.ini.
Heading	Added 'U' for underline edit type in .hdg file. "editHSLTU", "editVSLTU", etc.
Services Editor	Tools will be exported with service into wcf file by same name as wsv file. Tools can be imported with service by same method. When editing tools for service, can see list of current tool/serial numbers to pick from.
Panex Support	Bug fix to coefficients file read in
Panex Support	Enhanced Panex monitor and control
Creating Alias	Dialog will not close after alias created, but user will see status message if alias created successfully.
Backup	Was not checking set aside space for backups properly.
LIS export	Added option "OneFramePerRecord" to [LIS Export] section. Required for WellCad software to read sonic data.
Cal reports	Can draw rectangles around entries by prepending underscore before text. [Columns] entry can have start,stop values (1=0,20), and stop value for columns is required for rectangles to come out correct.
SCBL	Can manually adjust gates after automatic moves
Waveform Display	When multiple waveforms are in window, double click to fill window with that waveform and double click again to go back to multiple display.
Plotting to Fax	Move plot options to config dialog like other printers. Add option for Normal (100dpi) and Fine (200dpi). Default is Fine - which is what it was hard coded to before. Requires new entry in warrior.ini for [Fax] - "custom=faxfile32.dll".
Well Objects	Well object Highlight type can have different colors. Perfs with single depth will show up now.
Plotting	Added 'repeat' mode for correlation curves. Correlation curves will only be plotted if that curve is shown. So you can show curves from main pass on top of repeat pass to easily see repeatability
All Logging	Default software power controls to be off, override via new control word in service or global enable via warrior.ini

All Logging	New safety feature: Tool Power will be disabled if line current drops out
Merge	Warn user if depth correction is entered and no curves have depth correction to be applied
Tracer Interp	Can use caliper reading as casing ID value for calculations
CH	Support for Geofizika PL string
Tool string drawing	Was not always showing proper offsets for tracer tools
All Logging	Open line monitor temporarily inhibited during tool power voltage/current calibration
Perforating	Update CYShpl support to monitor AC/DC and Pos/Neg switch positions when available
All logging	Modifications to Sondex/CSS Compensated Neutron calibration and verification routines
Config restore	Run latest warrior convert option when restoring config files
Tool string drawing	Fix for multiple instances of the same tool
Direct printing	First plot from Job Editor will be spooled so printer won't start/stop
LAS Export	Fix CNTY=COUNTY
XY Plot	Can turn off curve labels. Added more curve styles. Print directly to Windows printer for better quality.
Hot var editor	Was not working properly on numeric values.
Waveform plotting	Fix for low vdl levels - before were coming out all white.
Interactive plot	Bug fix hang-up of Iplot if you have it minimized and save a well object to the same database.
All logging	Big fix for probe telemetry channel offset and Titan "combined" channel types
Services, Tools editor	Saving a service will also create a file with tools for that service, then Import will look for both files
Format editor	Speed up reading/writing of log formats
All logging	CYAuxF1 - new device support
DSP logging	Ability to specify pmon for "Probe" command
All logging	Tool Power monitor settings can be specified per service
All logging	Robertson Geologging 6 Channel and 12 Channel Telemetry support
All logging	CYShPnlF1 - new device support
CH Logging	Includes Hotwell PNN
	Release notes for previous release, Warrior Casedhole 051110
LAS Export	User can add their own heading information via [Heading] section in las.ini
All logging	Bug fix - Could cause "Unable to create curve" errors at log up time.
Windows printing	Can adjust resolution of Windows Printing source data via Warrior Control Panel. Lower resolution speeds up printing but can lower print quality. This setting is used in addition to the printer resolution set in the Windows printer settings.
All logging	Legend for curve names, Editable legend items, Uses banner for heading, Can plot constant values for reference.
Plotting	Add entry to warrior.ini in [Heading] section for "default banner". If entry not there then will use title.wlb
Sondex Support	Sondex PL supports flow detection on all lines including H2S. QPS bug fix
Plotting	Can show legend for shading in log inserts
All Logging	Prohibit Panel Type change (flag setting to enable in Warrior.ini)
All Logging	Logging releases use new style device drivers
All Logging	Sondex name fix, gauge overflow fix, smoother output filename handling

All Logging	Fix resource leak - was causing misc. device record and storage errors when recording multiple passes of logs with many outputs
Perforating	New Perf Job Planner
CTS Telemetry	CTS Telemetry monitor showing Caliper commands
Sondex Support	Sondex MIT supported
Panex Support	Panex GR support, other updates per Panex
Cal reports	Cal reports now have a heading with database and dataset source for cals.
Printrex printing	For 820RM printers, add 820RM=1 to printrex printer section in warrior.ini.
Heading	Added 'U' for underline edit type in .hdg file. "editHSLTU", "editVSLTU", etc.
Services Editor	Tools will be exported with service into wcf file by same name as wsv file. Tools can be imported with service by same method. When editing tools for service, can see list of current tool/serial numbers to pick from.
Panex Support	Bug fix to coefficients file read in
Panex Support	Enhanced Panex monitor and control
Creating Alias	Dialog will not close after alias created, but user will see status message if alias created successfully.
Backup	Was not checking set aside space for backups properly.
LIS export	Added option "OneFramePerRecord" to [LIS Export] section. Required for WellCad software to read sonic data.
Cal reports	Can draw rectangles around entries by prepending underscore before text. [Columns] entry can have start,stop values (1=0,20), and stop value for columns is required for rectangles to come out correct.
Memory Logging	Major enhancements for LGAT, Lonkar Gamma Analysis Tool
SCBL	Can manually adjust gates after automatic moves
Waveform Display	When multiple waveforms are in window, double click to fill window with that waveform and double click again to go back to multiple display.
Plotting to Fax	Move plot options to config dialog like other printers. Add option for Normal (100dpi) and Fine (200dpi). Default is Fine - which is what it was hard coded to before. Requires new entry in warrior.ini for [Fax] - "custom=faxfile32.dll".
Well Objects	Well object Highlight type can have different colors. Perfs with single depth will show up now.
Plotting	Added 'repeat' mode for correlation curves. Correlation curves will only be plotted if that curve is shown. So you can show curves from main pass on top of repeat pass to easily see repeatability
All Logging	Default software power controls to be off, override via new control word in service or global enable via warrior.ini
All Logging	New safety feature: Tool Power will be disabled if line current drops out
Merge	Warn user if depth correction is entered and no curves have depth correction to be applied
Tracer Interp	Can use caliper reading as casing ID value for calculations
CH	Support for Geofizika PL string
Tool string drawing	Was not always showing proper offsets for tracer tools
All Logging	Open line monitor temporarily inhibited during tool power voltage/current calibration

Section

1

1 Windows XP Set Up

The Warrior well logging system runs in the Microsoft Windows software (2000,or XP) environment. This gives the user many powerful tools and facilities not previously available in an inexpensive logging system. One of the principle advantages is that the system is multitasking, meaning that several programs (or tasks) may be running on one computer at the same time. Within the Warrior system, for example, several different log plots may be displayed independently on the screen and other logs may be directed to plotters. Headings may be prepared, and final log presentations set up, all whilst continuing to acquire data.

Another advantage of the Windows environment is the graphical user interface, which presents the functions available in the system in an easy to understand manner (well, fairly easy). Whilst the simple interface makes the Warrior easy and fast to operate, the full power of the system can only be realized when an understanding of MS Windows itself has been acquired. It is therefore strongly recommended that, after some initial experimentation with the system, the Windows User Guide is studied and the Windows Tutorials run. Courses are also available on videotape, and other media, from many sources.
We recommend customize the windows XP with the following presentations: (Fig: 1.1, Fig: 1.2, and Video1.1).

FIG: 1.1 Start Menu Presentation

FIG: 1.2 Taskbar Presentations

VIDEO: 1.1 MS_XP-Setup Presentation

Section

2

2 Warrior Software Installation

2.1 Distribution Media

The Warrior Data Acquisition Software version 7.0 (051114) or latest is distributed on one CDROM. Or the software is downloadable in the form of a single executable file WAR7CH05114.exe from the web site http://www.warriorsystem.com/under **DOWNLOADS** Warrior Software 32 Bit Version Warrior 7.0 STD Casedhole 051114 This file should be copied to a temporary directory and run to expand itself. To install the Warrior software runs the SETUP.EXE.

It is a fact of life that every computer system will, sooner or later; suffer a failure, such as a disk crash, where there is the potential for loss of programs and/or data. This will generally happen at the most inconvenient time. The importance of keeping current backups cannot be overemphasized. It is vital that the time be taken to keep current backups of all essential programs and data.

All Warrior systems from Scientific Data Systems are shipped with some type of mass storage device, (usually a CD-R/W drive) which can be used for backing up programs and data. The procedure for using CD drives varies with the software supplied. Become familiar with the specific software by reading the manual, or select 'Help' after starting the program. It may be useful to purchase an off the self-CD program to standardize all systems.

All files copied from a CD to a hardrive are written as read only. Some files used by the Warrior software will not function properly as read only. To change the attribute, use Windows Explorer select the copied files, right click on the files and select properties, uncheck the 'Read Only' Attribute and click the apply button.

The warrior system is usually configured for the selection of services to be run by a given client. This information is primarily contained in three files, Warrior.ini, Services.ini, and Tools.ini. (A copy of all files a client can changed and back up to floppy by using Backup/Restore utility 'Configuration Files'). A complete backup of the Warrior program (excluding data base files) can be done using the Backup/Restore Utility.

2.2 New Installation Warrior Software.

Previous to the installation of the Warrior software we recommend to update the Windows operating system through the Internet connection. When performing a new installation all Warrior program files, default configuration and Data files are copied to hard disk. Configurations are subsequently modified to suit customer requirements.

Warning!

Restart the computer and turn OFF the Interface Panel Power supply

Place the new version of Warrior CD in CD Drive. It should auto run if not run setup from CD causes the installation. An interactive menu appears as shown in The Fig: 2.1

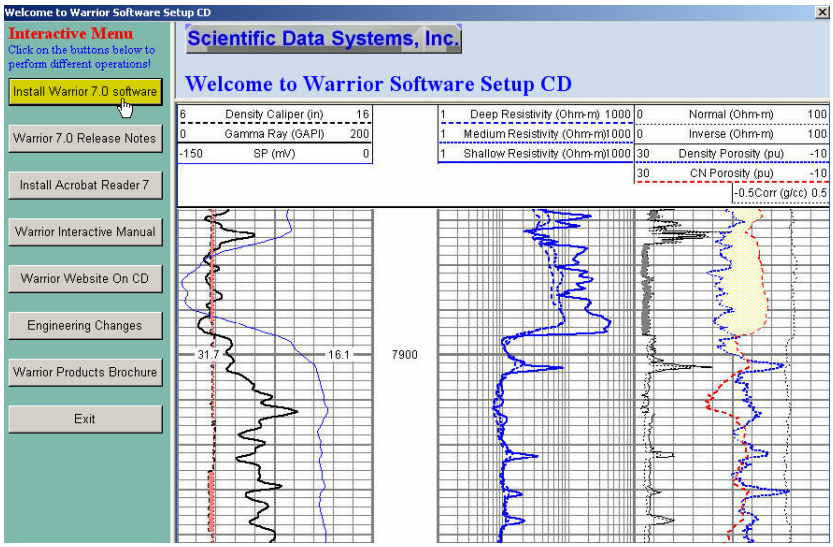


FIG: 2.1 Interactive Menu.

Click on **Install Warrior 7.0 Software**

FIG: 2.2 Warrior 7.0 Version 051114

Click **Next** to continue with the Setup program.

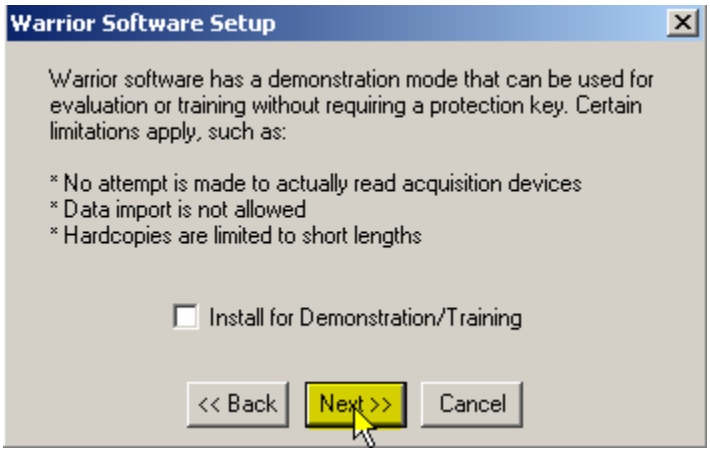


FIG: 2.3 Warrior Software Setup

At this screen a choice can be made to install the software in Demonstration/Training Mode.
In this mode, no software USB key is required and most functions can be accessed in a limited way for training. However, all acquisition and import capabilities are disabled.
Approximately 300 feet of log can be plotted when in this mode. Services and Tools can be entered, checked and installed on a full system. The software may be switched between Normal and Demo modes by the Demo Mode parameter in the [GLOBAL] section of the Warrior.ini file. Normal Mode has "Demo-Mode=0"; Demonstration and Training Mode has "Demo-Mode=1". Note that a reboot is required after changing this parameter.

Click **Next** to continue with the Setup program, if the software would be run in demo Mode check **Install for Demonstration/Training.**

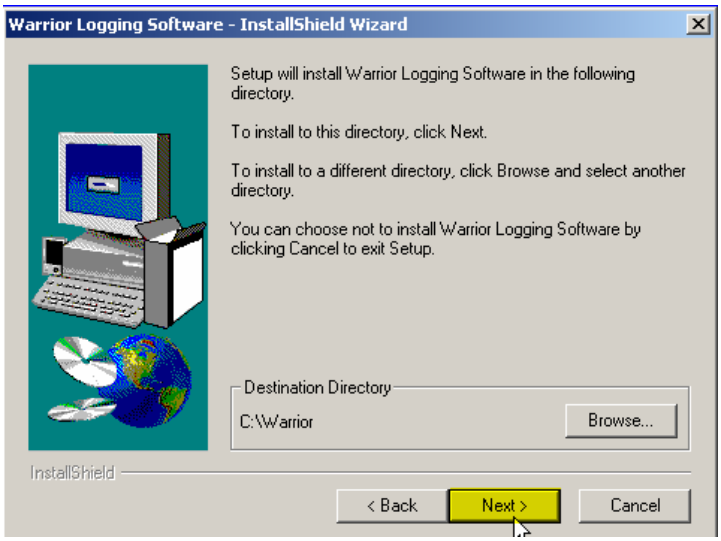


FIG: 2.4 Setup directories

Install to default directory C:\Warrior, Click **Next**

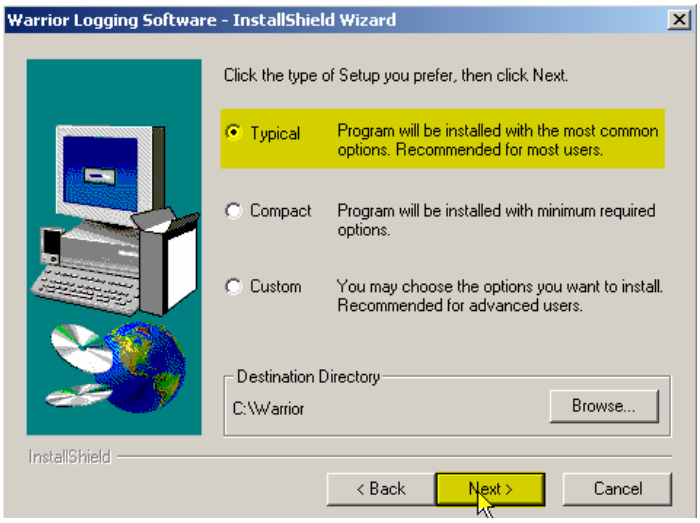


FIG: 2.5 Setup Options

Fig: 2.5 Shows the choice of setup types available. **Typical** installs all the available items, **Compact** installs the minimum set of items and **Custom** allows you to choose which items to install. For a new installation, select the **Typical** option. If you wish to install to a directory other than the default (\Warrior), change the **Install to** entry now (However, this is not recommended). Click on **Install** to copy the programs, data and other files. Select the **Typical** option, and then click **Next**.

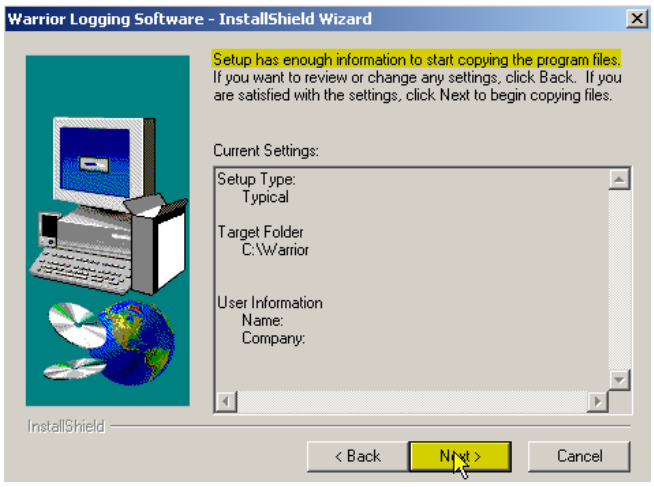


FIG: 2.6 Setup Ready to install

Click Next to continue.

FIG: 2.7 Setup has finished.

Remove any disk from their drives, and click Finish to complete setup.

VIDEO: 2.1 Install the Warrior Software for the First Time

2.3 Warrior Software Upgrade or Perform new versions.

Upgrades are released from time to time to distribute new or improved components of the software. These are different from upgrades, which are full releases in their own right.
Upgrades Warrior Data Acquisition Software version 7.0 (051114) or latest is distributed on one CDROM. Or the software is downloadable in the form of a single executable file WAR7CH05114.exe from the web site http://www.warriorsystem.com/ under **DOWNLOADS** Warrior Software 32 Bit Version Warrior 7.0 STD Casedhole 051114 This file should be copied to a temporary directory and run to expand itself. To install the Warrior software runs the SETUP.EXE.

Restart the computer and turn OFF the Interface Panel Power supply
Place the new version of Warrior CD in CD Drive. It should auto run if not run setup from CD causes the installation. An interactive menu appears as shown in The Fig: 2.8

To install the update from CD, Place the new version of Warrior CD in CD Drive. It should auto run if not run setup from CD. When upgrading from an existing installation, the current Warrior system program files and configuration files are saved to a backup directory. If problems occur with the new installation, the previous installation can be restored entirely. Select Upgrade from Version X.x to Version Y.y, the program files will be updated and existing configuration files will be then retained.

FIG: 2.8 Warrior 7.0 Version 051114

Click **Next** to continue with the Setup program.

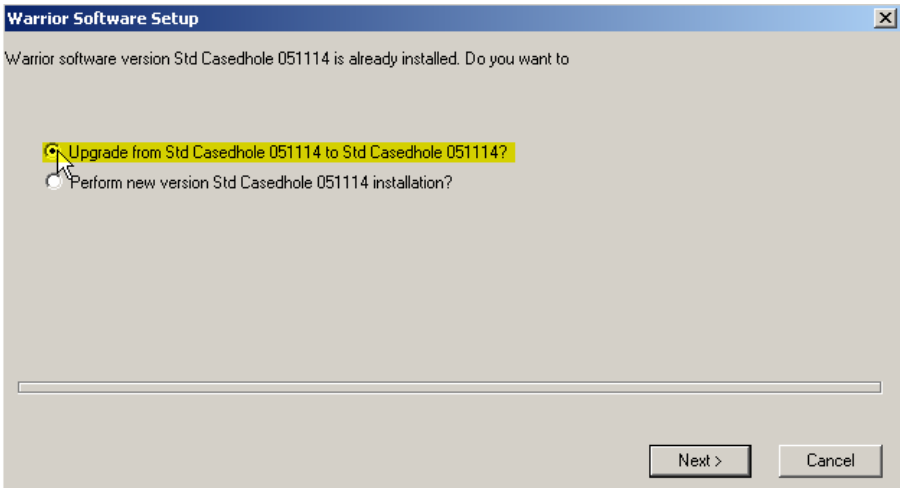


FIG: 2.9 Upgrade and Perform new version.

The Upgrade option of the software will keep the Services, Tools configurations, your customized presentations, and the tools string.
The option perform a new version the system will install new software, but it will perform a backup before of installing the new version, the system performs a backup and saves in the following path **C:\warroldbin**
If either upgrade or new version is selected and a previous version of Warrior exists, the current installation is saved to a backup directory.

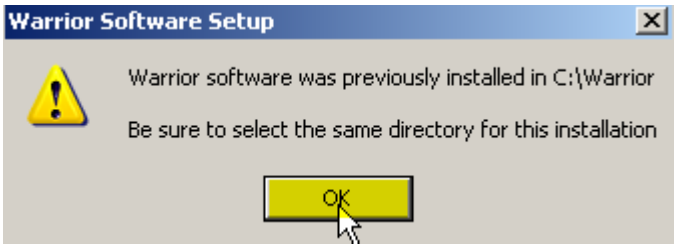


FIG: 2.10 Start the installation

The following dialog box (FIG: 2.11) will be shown while the information is being backed up. No action is required.

If you wish to backup to a directory other than the default (c:\warroldbin), click the Browse button and select the directory that you wish to use.

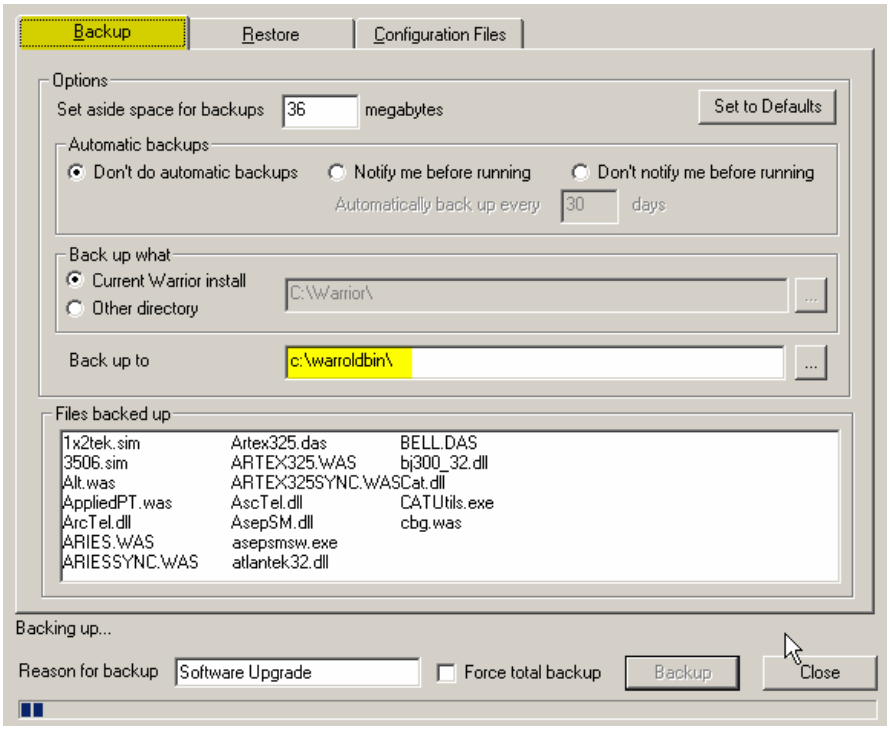


FIG: 2.11 Backup files

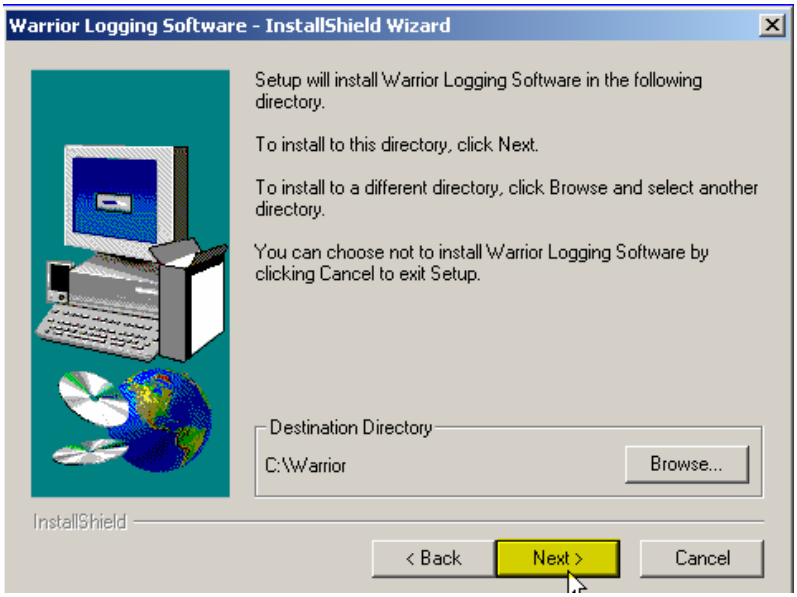


FIG: 2.12 Setup directory

VIDEO: 2.2 Warrior Upgrade or Perform a new version

2.4 Warrior Software Structure

The Warrior system has been designed to run a large number of downhole tools from a variety of manufacturers. For this, and other reasons, the system is highly configurable. The configuration of a particular installation is controlled by a number of configuration files. These files reside in the active warrior directory. At the time of commissioning of a system the configuration files are always modified from the SDS general release to meet a clients particular requirements. SDS does not keep copies of every installation, and while it is always possible to regenerate a particular configuration it is much simpler if copies of the configuration files are made and stored safely.

Under warrior the system has the following folders:
BIN 32: are all the Applications (.exe), Dynamical link libraries (.dll), Digital Acquisition Script (.DAS, and .WAS), Simulator files (.sim), System file (sys), and Help files (.hlp). Control Files (.cnt), CBL Acquisition Script (.cas)

CONFIG: are all configuration setting (.ini), Company logo (.lgo), Warrior Calibration File (.wcf), Warrior Service File (.wsf), Warrior Import Filter (.wif), Warrior Convert File (.wcu).

DATA: the database from the logs.

FAX: The structure system to received and sends faxes.

DRVERS: The system drivers (.sys), Dynamical link libraries (.dll), and setup information (,inf)

FORMAT: Heading (.hug) , List Export Template (.let), Presentation Script (.prs), Warrior Calibration Plot (wcp), Warrior Tool Diagram (.wtd), and Warrior Well Diagram (.wwd).

MANUAL: Warrior Manual. PDF

TEMP: Temporal files.

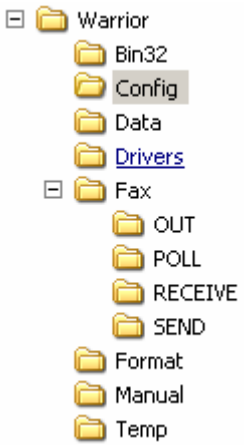


FIG: 2.13 Warrior Structure.

2.4.1 Program Files

EXE (Executable files). Software programs start from an executable file.
DLL (Dynamical Link Library files). EXE files will call these to execute certain functions.

2.4.2 INI Files

There are several files with suffix .ini. They are generally used to store information concerning the overall setup of the system, and also information concerning tools and services. The files are generally updated from Warrior programs, but it may sometimes be desirable or necessary for the advanced user to update them directly using a text editor.

Before changing any *.ini file make a copy of the original under another name so that if anything goes wrong you can recover by reverting to the original.

Warrior.ini – Controls the system settings for a particular system. The warrior.ini file contains information concerning the global configuration of the logging system, both hardware and software. It is divided into sections delineated by keywords inside square brackets. Many parameters are set from Warrior system menus; however, some may only be modified from the warrior.ini file.
It defines such things as where and how data is obtained. Default headings, default log scales, screen and plotter setups, and certain logging service parameters are setup in this file. (It is what makes a system different from other systems). The primary edit programs for this are the Warrior Control Panel and the Depth control panel.

Services.ini – Defines what services are available from acquisition and how each individual service is setup. The primary edit program for this is the Edit Logging Service Details button from Warrior Utilities.

The warrior system is highly configurable in order to support a wide variety of downhole tools. SDS sets up the services.ini file for a particular service set according to client and hardware requirements. **Do not modify it without first creating a backup.**

The first series of entries define the content of the Services menu in the Acquisition module. The following entries define the setup of those services. Services are composed of one or more tools.

Tools.ini – Defines the tools that are available for the system. Information includes physical model description (length, weight, type software, default filters, etc.) and calibration information for each particular serial number.

Annotate.ini-Defines the annotation text which appears in the annotation window.
Items under Always appear in the selection box of the annotate window and may be added or deleted and may be translated into another language.
Items under translations define the extended curve names produced when a mnemonic is chosen from the list in the annotate window. The `translation' may change to whatever the user requires.
Text file used to setup default annotation selections. May be edited using WordPad or notepad.

Gates.ini – Text file used to save the PMON discriminators and WAVEFORM gates setups.
LAS.ini – Text file used to setup default settings for writing LAS files, may be edited using WordPad or Notepad.
LISTOWAR.ini – Text file used for conversion of warrior mnemonics to standard LIS mnemonics.
VARS.ini – Default variables when acquisition starts. May be edited using WordPad or Notepad.
Printers.ini – Default printer setups for adding printers through the warrior control panel.
CGBTEL.ini, Servedit.ini, Tooledit.ini, Trcintrp.ini, Units.ini, and Wobjedit.ini are miscellaneous text files used to initialize certain services or programs.

2.4.3 LST Files

Layouts.LST – Text file to describe default grid layouts for log formats in the Format Editor. May be edited using WordPad or Notepad.
Data.LST – Text file used for default DB item List when defining a curve in the Format Editor. May be edited using WordPad or notepad.

2.4.4 Miscellaneous Warrior File

DAS – DSP Data Acquisition Script. Text file used to control how the Digital Signal Processor looks at signals and acquires data.
HDG – Heading File. Text files that describe what is in a heading. May be edited using WordPad or notepad.
WLB – Well Log Banner. Text files that describe what is in a banner. May be edited using WordPad or notepad.
HLP – Help files for particular programs.
LET – LIS Export Template. Text file used to describe how Warrior Data is exported to an LIS file. May be edited using WordPad or Notepad.
BIN – Binary files used by certain processes (Mainly DSP).
CNT – Control files used by certain processes.
LGO – Warrior Logo Files. Created by use of MFGRAB.exe.
PRS – Warrior presentation file. Text file used to describe log format presentations. Edited with the Log Format Editor.
WCF – Warrior Calibration file. Exported file used by the Tool editor for exporting/importing tool calibrations.
WCP – Warrior Calibration Plot. Text file that describes how a calibration is printed out during a plot job. May be edited using WordPad or Notepad.
WSV – Warrior Service file. Used by the service editor for exporting and importing services.
WTD – Warrior Tool Diagram. Created by use of MFGRAB.exe.

2.4.5 Data Base Files

Files, which terminate in the suffix .db are Warrior database files. They contain the well log data stored in a hierarchy by field, well, run and pass. The Warrior database file is physically a DOS file. Within the DOS file data from multiple wells or jobs may be stored, although generally one job is stored in a database file. The database files also contain various embedded files which themselves contain important information. These include:

- Service data, e.g. tool string, depth offsets, filters etc. which relate to the log data within the *.db file.
- Headings, the completed heading information and formats generated by the Heading Editor.
- Plot job, the information generated by the Plot Job Editor for one or more plot jobs.
- Annotations or curve labels.
- Well sketches.

2.4.6 Warrior\ Bin32

DAS and WAS – DSP Data Acquisition Script. Text file used to control how the Digital Signal Processor looks at signals and acquires data.

2.4.7 Warrior\ Config

Layouts.LST – Text file to describe default grid layouts for log formats in the Format Editor. May be edited from the Format Editor by choosing Layout – Edit Layout
Data.LST – Text file used for default DB item Quick Pick List when defining a curve in the Format Editor.
CNT – Control files used by Help file processes.
HLP – Help files for particular programs.
LGO – Warrior Logo Files used in Headings and Log Banners.
WCF – Warrior Calibration file. Exported text file used by the Tool editor for exporting/importing tool calibrations.
WMP – Warrior MATH PACK file. Text file for saving Math Pack calculations.
WSV – Warrior Service file. Text file created by the Service editor for exporting and importing services.
SIM – Binary file used for playback of recorded signals by the Warrior Simulator Box.

2.4.8 Warrior\ Data

DB – Warrior Database Files.
LAS – ASCII data files that are produced from an LAS Export.
PDF – Adobe Acrobat Portable Data File produced from a Warrior Print to PDF Action.
TIF – Graphical image Tiff file produced from a Warrior Print to TIFF action.

2.4.9 Warrior\ Format

HDG – Heading File. Text files that describe how a heading is constructed and what information can be shown in a heading.
LET – LIS Export Template. Text file used to describe how Warrior Data is exported to an LIS file.
PRS – Warrior presentation file. Text file used to describe log format presentations. Edited with the Log Format Editor.
WCP – Warrior Calibration Plot. Text file that describes how a calibration is printed out during a plot job.
WLB – Well Log Banner. Text files that describe how a Log Banner is constructed and what information can be shown in the banner.
WRF – Casing Joint Table. Text files that describe how a Casing Joint Table is constructed and what information can be shown in the table.
WTD – Warrior Tool Diagram. Normally created through the Logging Tool Editor.
WWD – Graphical file for user defined well object in the Well Object Editor.

2.5 Create Device Manager on Desktop

In Windows XP. Open Windows Explorer, navigate to C:\Windows\system32 find devmgmt.msc Right-click on the file select Send to Desktop (create shortcut). Rename this shortcut to Device Manager.

VIDEO: 2.3 Device Manager

2.6 Warrior Shortcut Icon

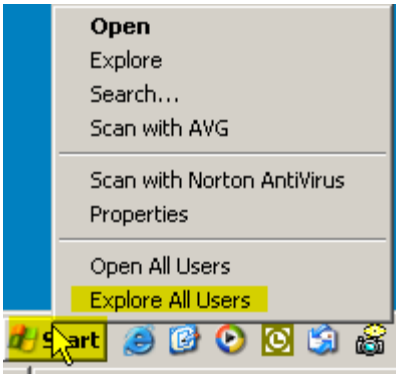


FIG: 2.14 Explore All Users

On Start Right Click and select Explore All Users

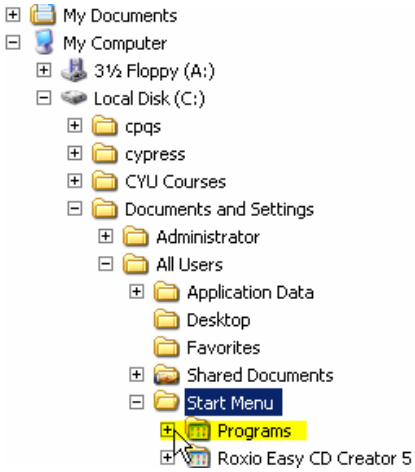


FIG: 2.15 Select Start Menu\Programs\Warrior 7.0

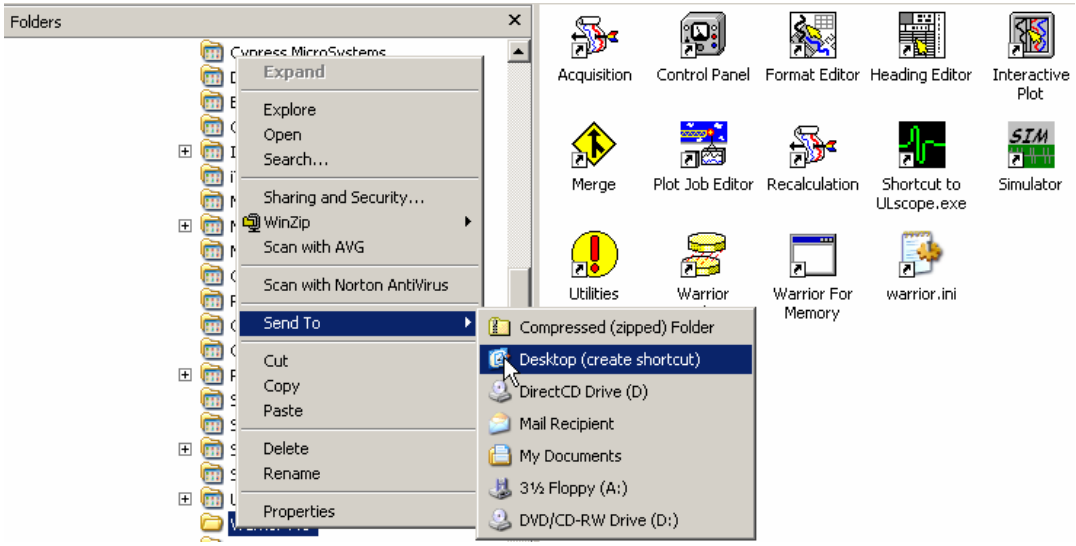


FIG: 2.16 Send the Shortcut Icon to Desktop

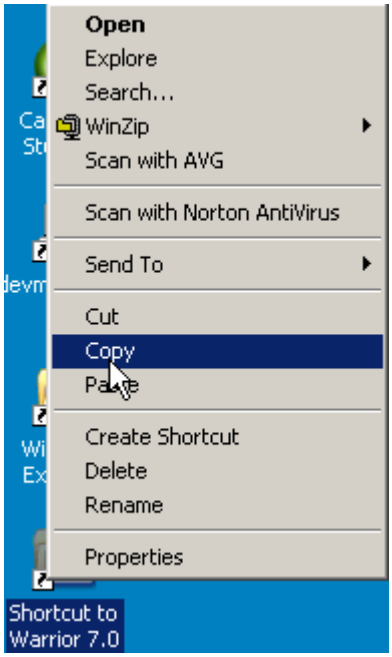


FIG: 2.17 Copy the Shortcut Warrior 7.0 and Paste to Start Menu

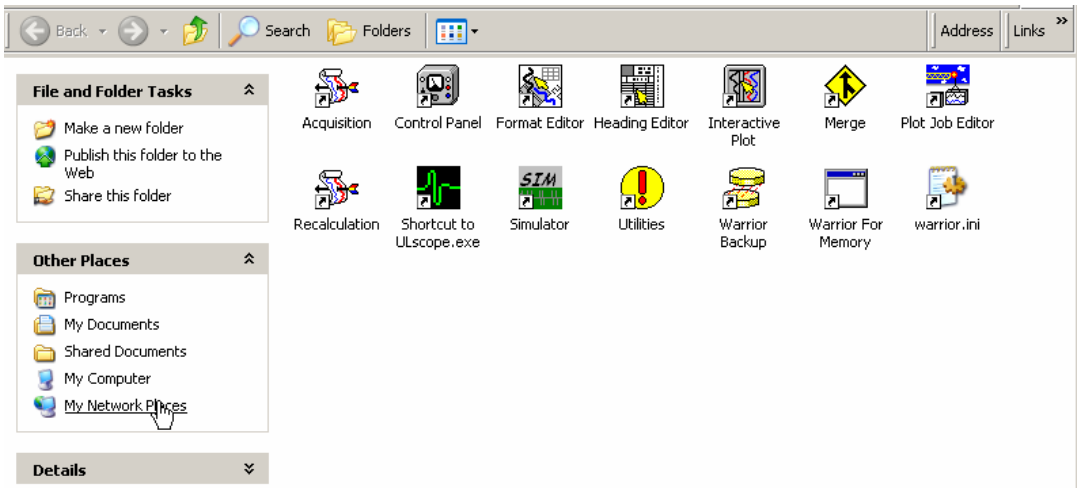


FIG: 2.18 Open the shortcut warrior 7.0 and Select Tools\Folder option

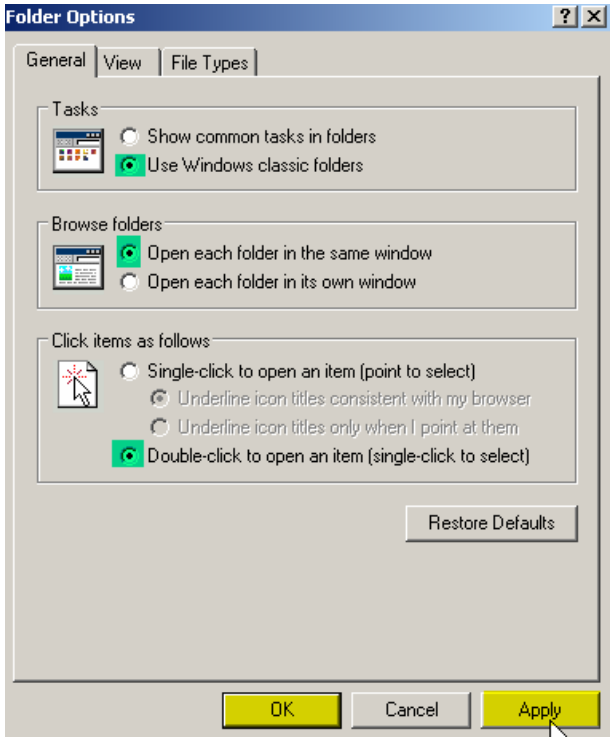


FIG: 2.19 Folder Options

Check Use Windows classic Folders open each folder in the same window, and Double click to open an item (single click to select) select **Apply** and **OK**.

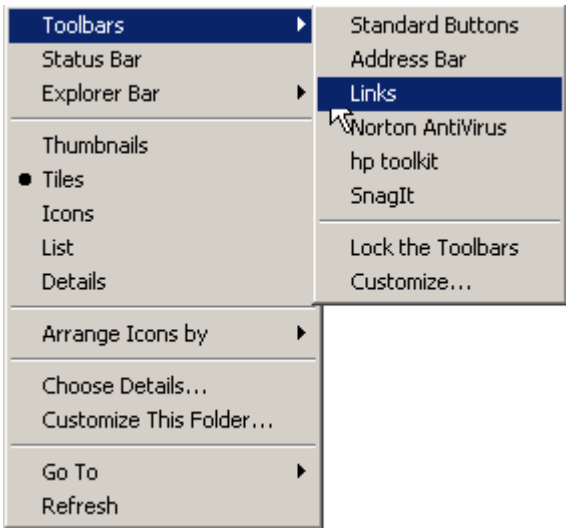


FIG: 2.20 Select View\Toolbars uncheck Standard Buttons, Address Bar, Link, and check Tiles

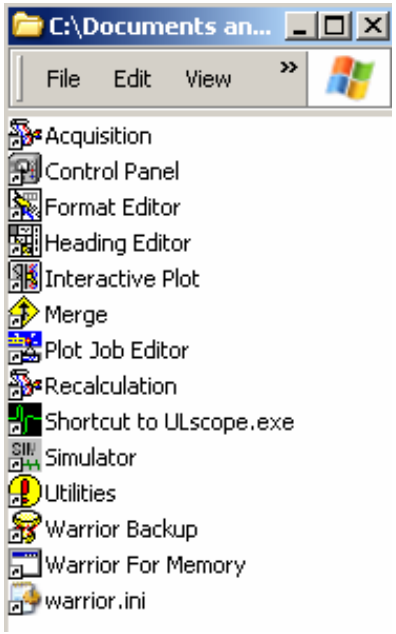


FIG: 2.21 Resize the Window and move to right bottom side

VIDEO: 2.4 Warrior Shortcuts

2.7 Key Software Authorization Setup

There are two types of keys commonly supplied with systems:

2.7.1 Full key

Allow complete and unrestricted operation of the Cased Hole and/or Open Hole Software.

2.7.2 Companion key

Allow full operation of all the software, except for logging data against depth from an encoder. Companion keys are generally supplied on their own for stand-alone desktop processing systems.
A Warrior USB key must be attached to a USB port on the computer for the software to operate (unless it has been installed in Demonstration mode). In addition, the key code and the panel type for the key being used (which is written on the tag attached to right side of the panel) must be entered into the Warrior Control Panel for the key to be recognized.
Connect the Computer to the Warrior Panel (CP/CD/PA/OP/SLA) with USB Cable and let the panel OFF.

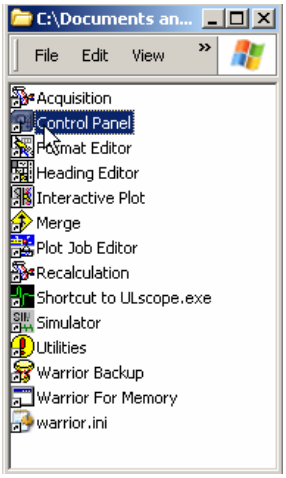


FIG: 2.22 Select Control Panel

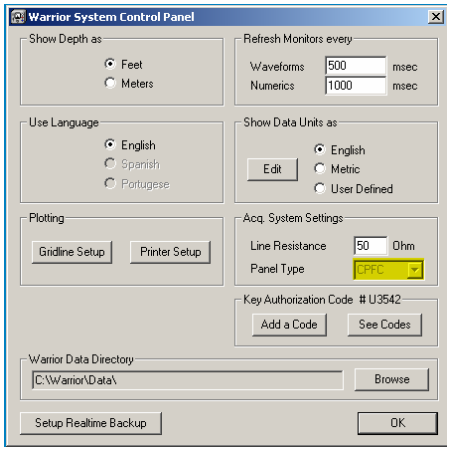


FIG: 2.23 Panel type

The software read automatically the Panel Type from the USB key inside the panel

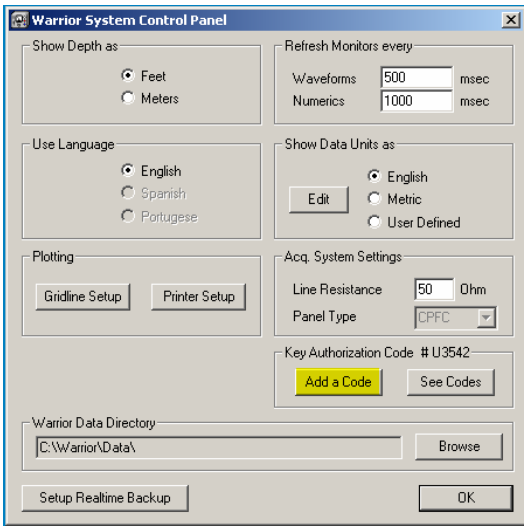


FIG: 2.24 Click on Add Code

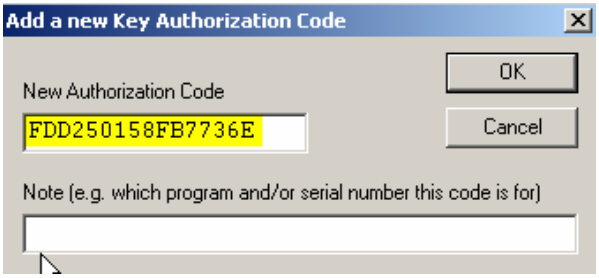


FIG: 2.25 Type the Key Authorization Code (16 Hex Digits).

In Demo Mode the software does not need the Key authorization.

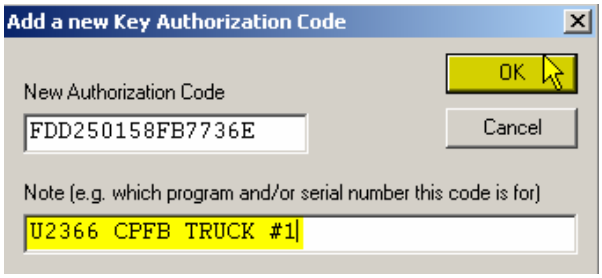


FIG: 2.26 Type the notes about the Key Number, Panel Type, Software version, and Logging Unit.

VIDEO: 2.5 Key Authorization setup

2.8 Warrior USB Drivers Setup

USB Warrior Drivers are copy under C:\Warrior\Drivers the first time you installed the Warrior Software.
Since your computer comes with more than one USB port to connect your Warrior Panel, the Following procedure should be repeated for each USB port in the computer:

- Connect the USB from Warrior Tool Interface Power Supply Panel cable to the new USB port Computer.
- Turn ON the Warrior Tool Interface Power Supply Panel.

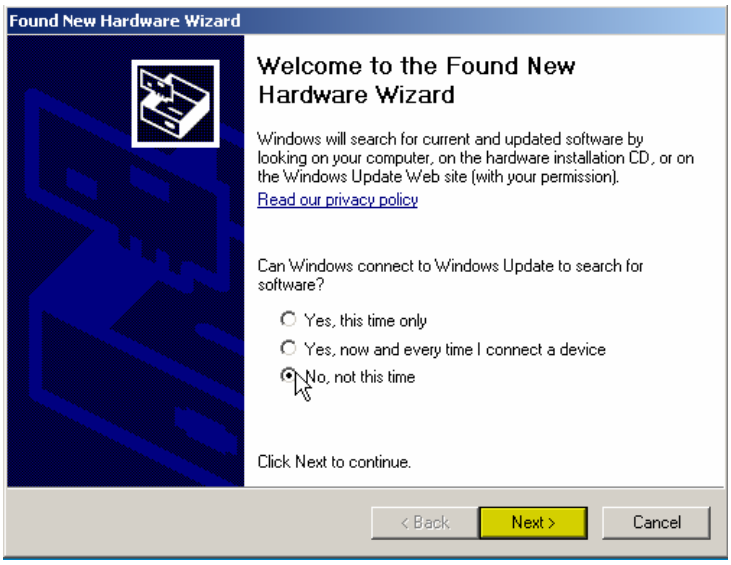


FIG: 2.26 Windows XP Found New Hardware

Select: **No, not this time** and click on **Next** to continue

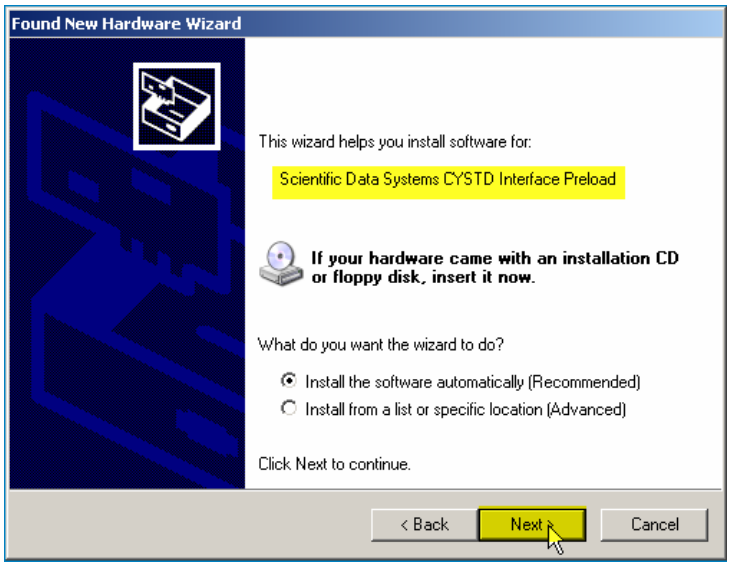


FIG: 2.27 Cypress Driver STD interface Installation

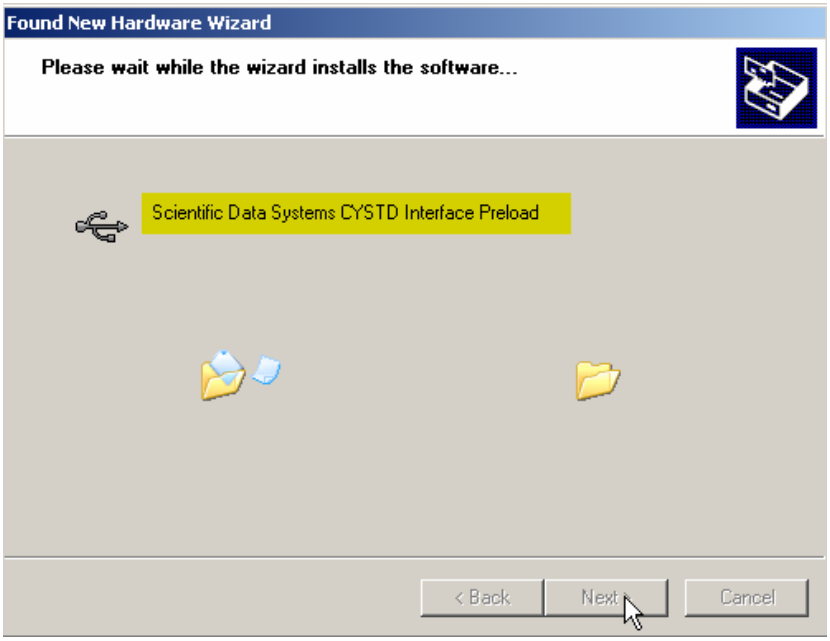


FIG: 2.28 Preload Driver CYSTD

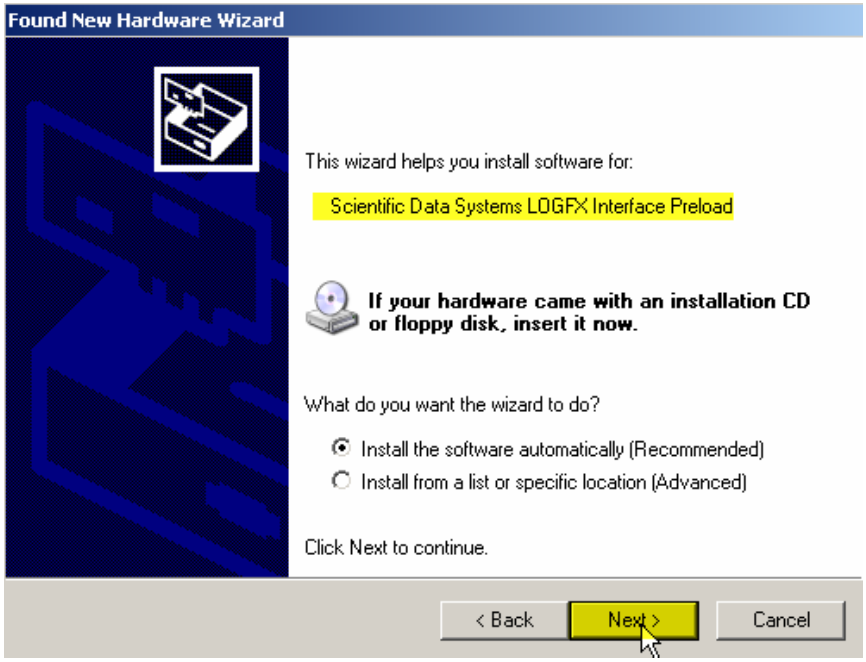


FIG: 2.29 Start LOGFX Interface Preload.

Click on Select **Next** to Continue

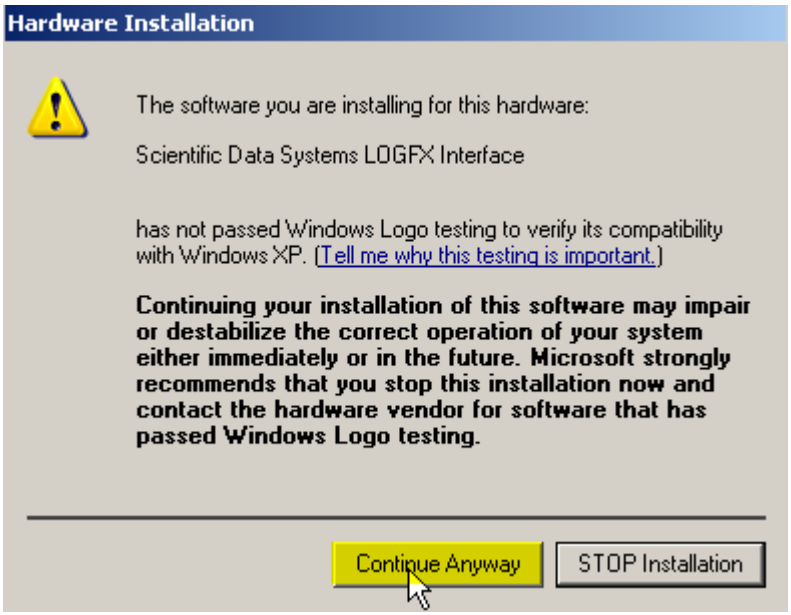


FIG: 2.30 Continuing your Installation

Click on **Continue Anyway**

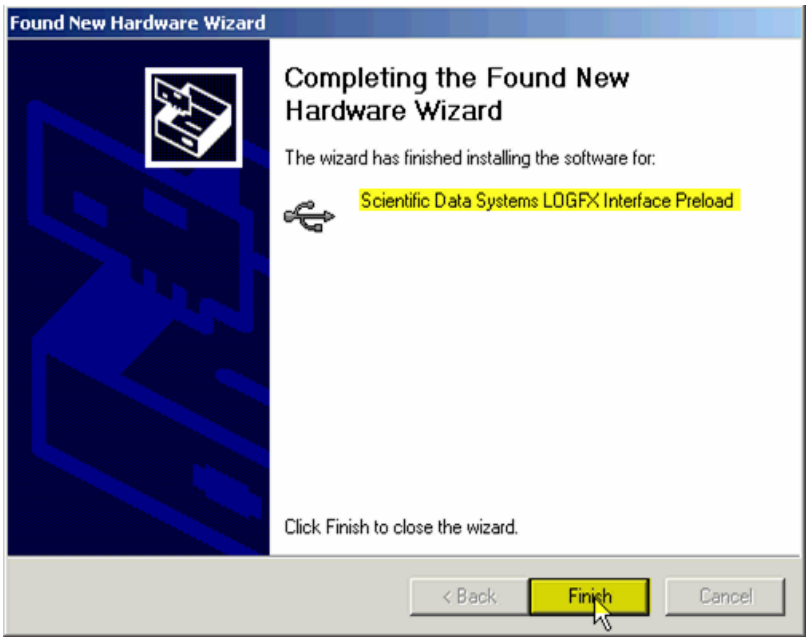


FIG: 2.31 End the LOGFX Interface Preload

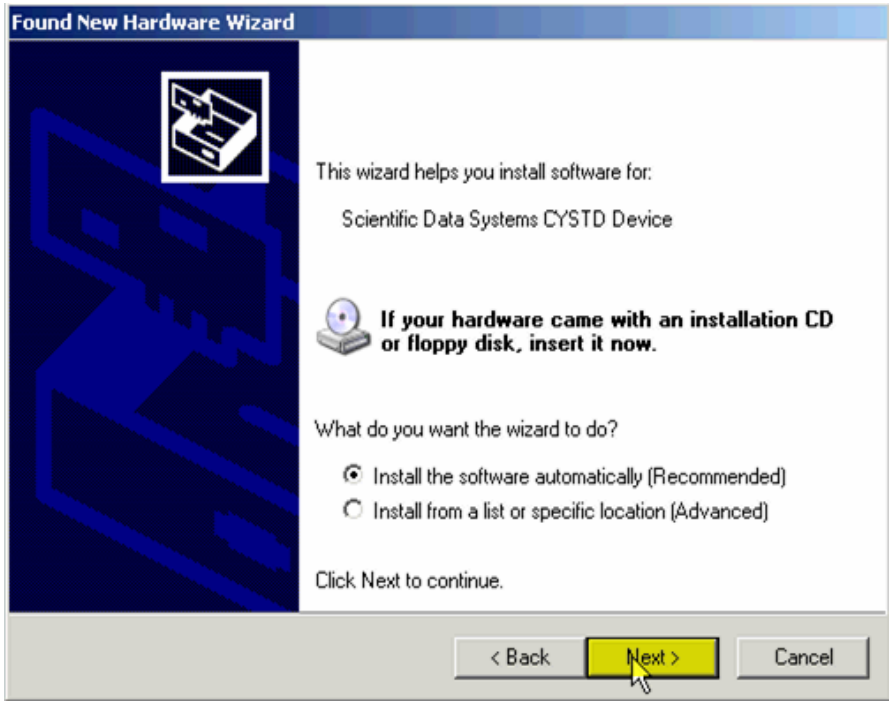


FIG: 2.32 Install driver CYSTD

Click on Select **Next** to Continue

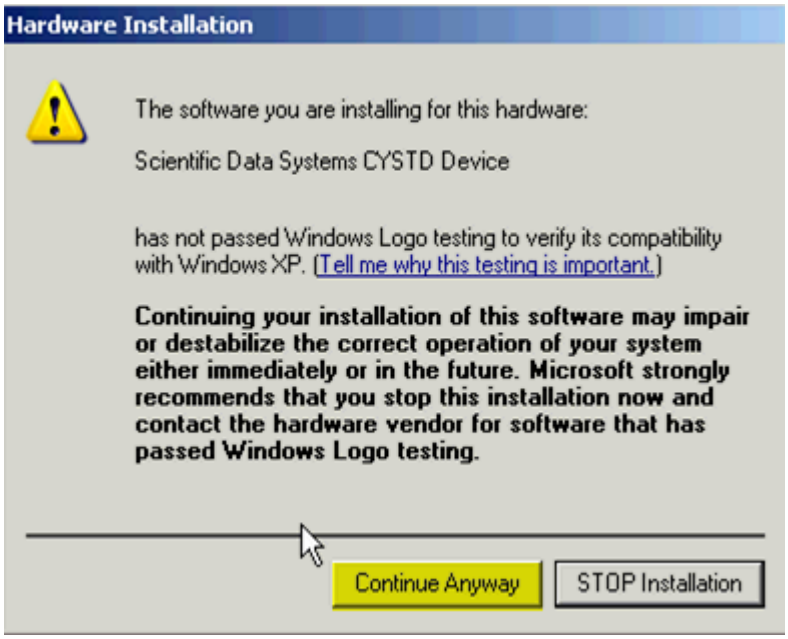


FIG: 2.33 CYSTD Driver Installation

Click on **Continue Anyway**

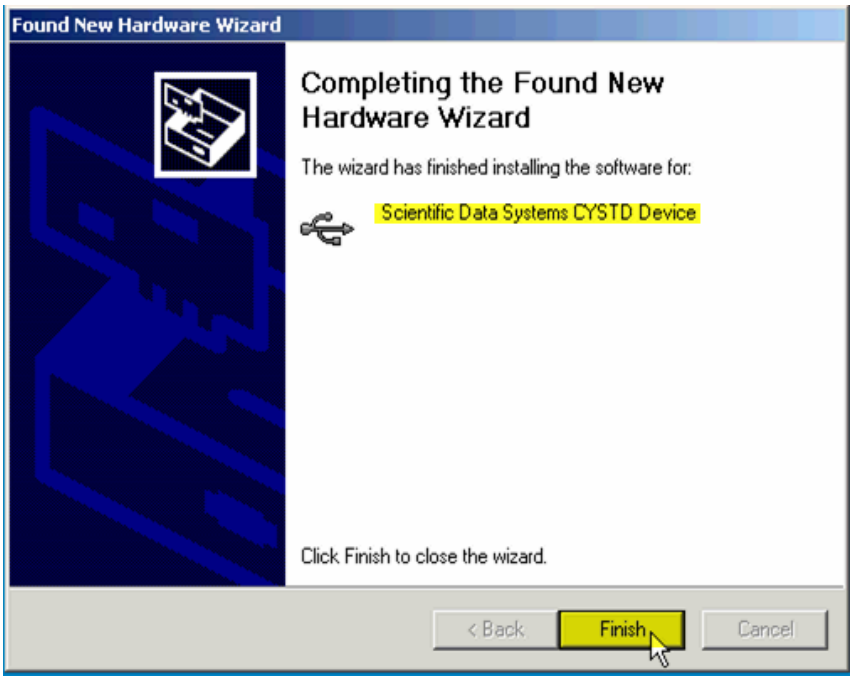


FIG: 2.34 End CYSTD Installation

Click on Select **Next** to Continue

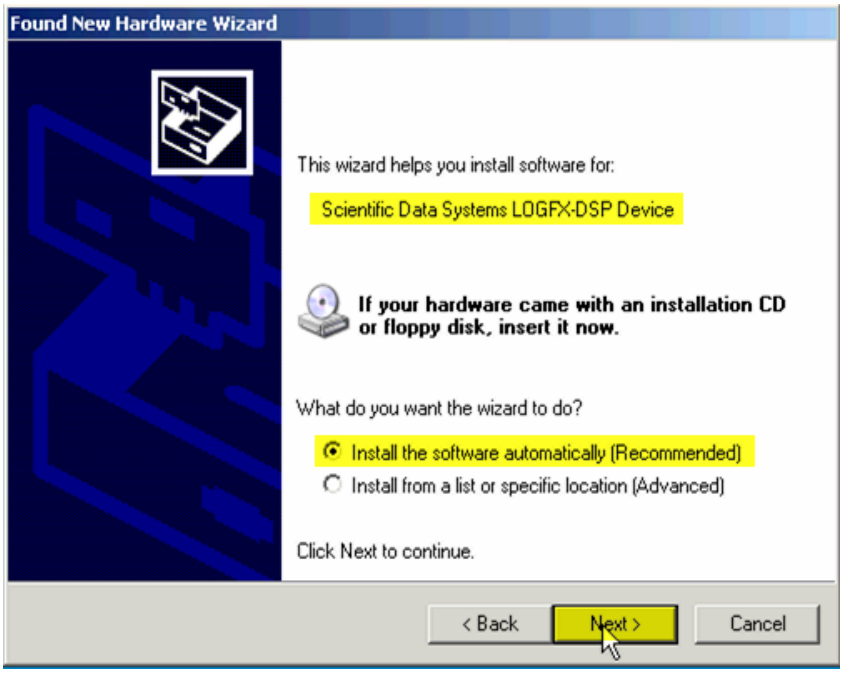


FIG: 2.35 Install driver LOGFX-DSP

Click on Select **Next** to Continue

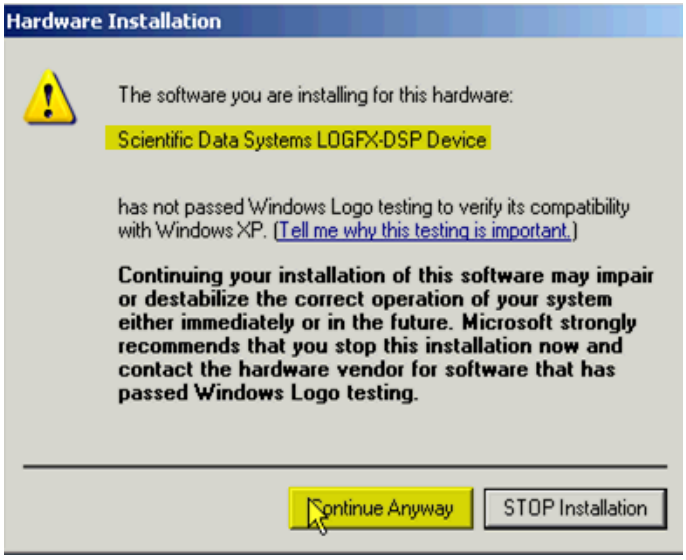


FIG: 2.36 Install LOGFX-DSP Device

Click on **Continue Anyway**

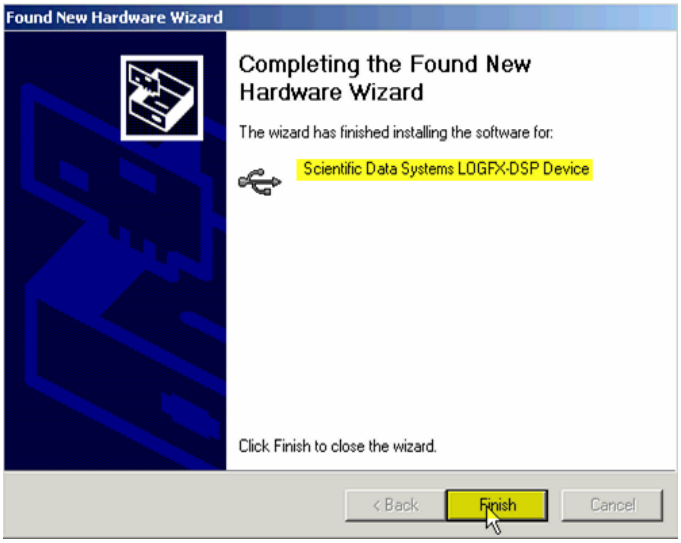


FIG: 2.37 End LOGFX-DSP Installation

Click on **Continue Anyway**
Turn OFF the Warrior panel, Connect the USB Cable to next USB port, Turn ON the Warrior Panel and repeat all the process until pass for all the USB ports in the Computer.

VIDEO: 2.6 Drivers Installation.

2.9 Device Manager

The device manager checks the connectivity between the Devices (Warrior Panel), USB Connection, and the computer. Double click over Icon

FIG: 2.38 Device Manager Icon

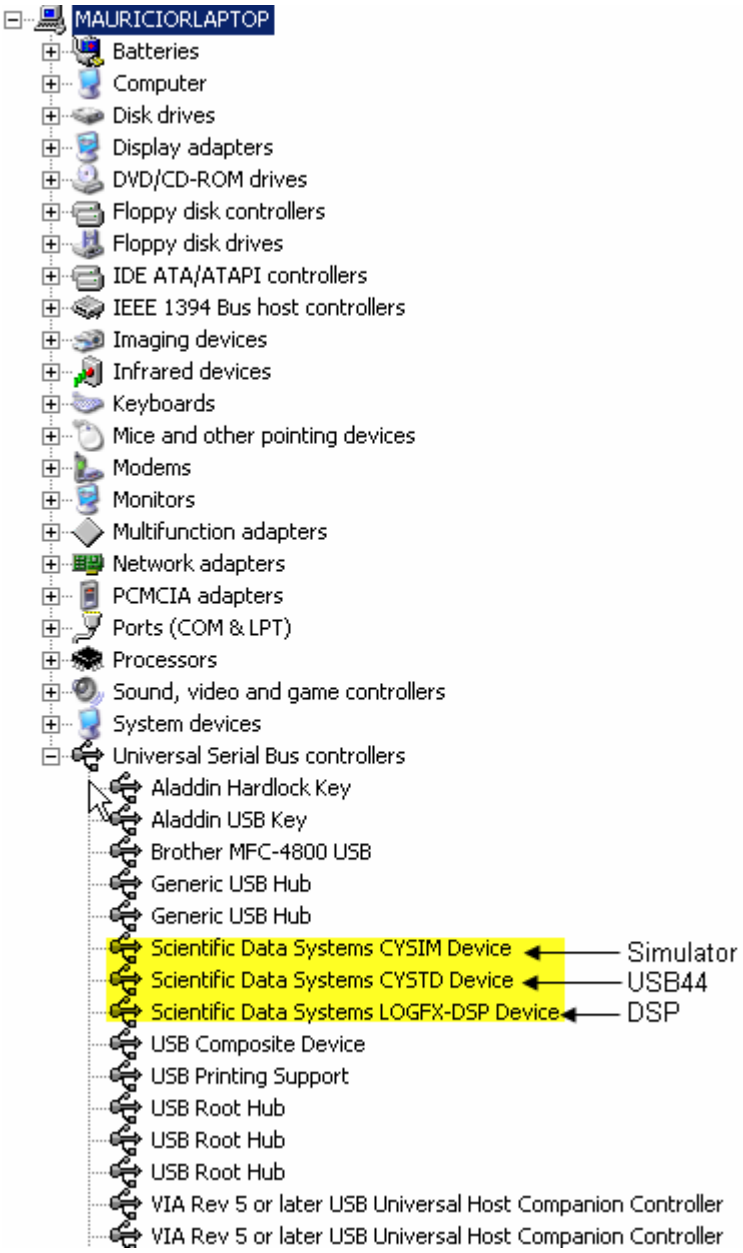


FIG: 2.39 Device Manager Path

The new Warrior software version install in XP windows Control panel the new Devices:

CYSTD: Replace the old DAMUPCI (USB44 Board)
CYAUX: Replace the old USBAUX (Slab, Sondex Panels)
CYDEP: For a new Acquisition/Depth Panel
CYUSB: Generic Replace the HID (Human Interface Devices drivers for USB44 board)
EZUSB: Generic used by DSP
SDSLOGFX: DSP Driver

DEVICE MANAGER:
Scientific Data Systems CYSTD (USB44 Board)
Scientific Data Systems LOGFX-DSP (DSP Board)
Scientific Data Systems CYSIM (Simulator Box)
Scientific Data Systems CYSHPNL USB Shooting Panel)

The new software version installs the Icon Scientific data Systems under Control Panel
Aladdin USB Key is inside the panel, Simulator is connecting to USB HUB, SDS LOGFX-DSP, and USB44 are inside the panel.

FIG: 2.40 SDS Control Panel

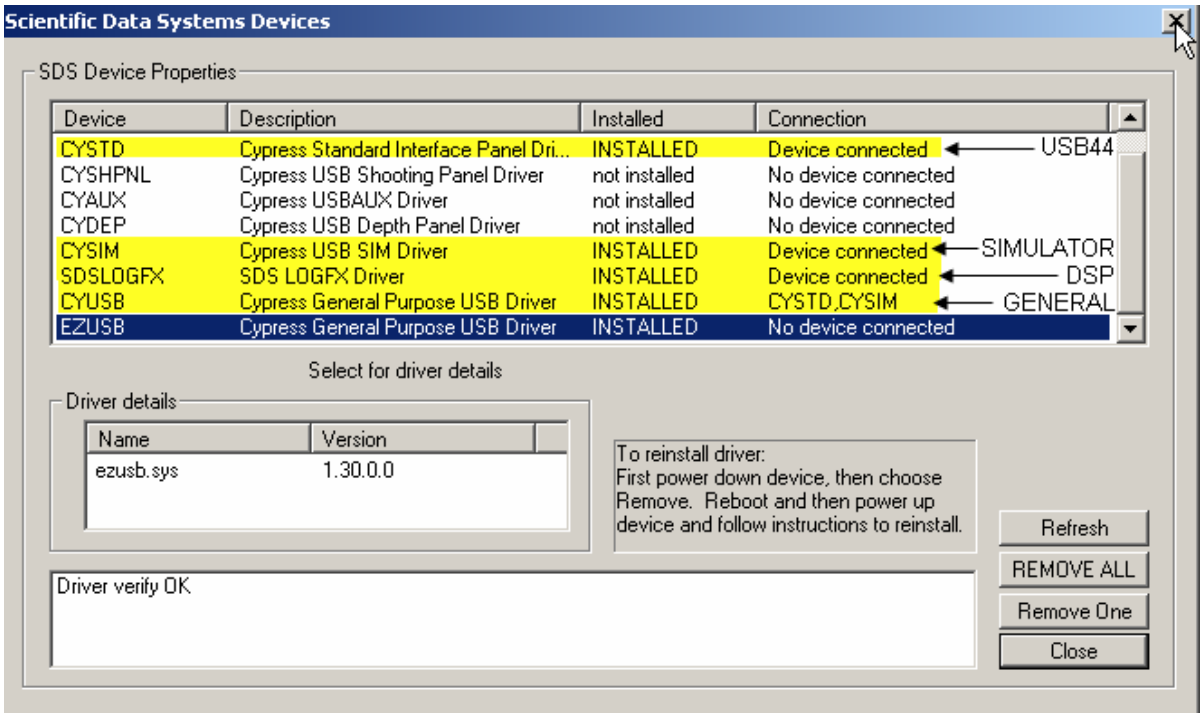


FIG: 2.41 SDS Device Properties

2.10 Creating Logo

The following will explain how to create a Warrior Logo file (*.LGO files) for use on headings and log banners. The primary Warrior program for creating LGO files is called MFGRAB.EXE and is located in the Warrior\Bin32 folder. MFGRAB “captures” any graphic image that is on the Windows Clipboard and allows the user to save the file as an image that can be used by the Warrior Software. This is the last part of the process and is relatively easy. The hard part is to get an appropriate logo copied to the Windows Clipboard.

For a logo to work correctly in the Warrior Standard heading, it should be twice as wide as it is high and be outlined with a heavy dark line. The actual dimensions used are not critical, it is the two to one relationship that is important so that the logo will appear in correct proportion when placed in the heading. If the logo is not outlined, it will cover the Border area of the heading around the logo and make it look unusual.

If you do not have any existing graphical image for a logo, such as a JPG, TIF, or BMP, you can use most drawing program such as Windows Paint to create your LOGO image. If you meet the above criteria, you should be able to copy the image directly to the Windows Clipboard. In Paint, this is done by clicking on **Edit ->Select All**, to select the image. Then clicking on Edit -> Copy, to copy the image to the clipboard.

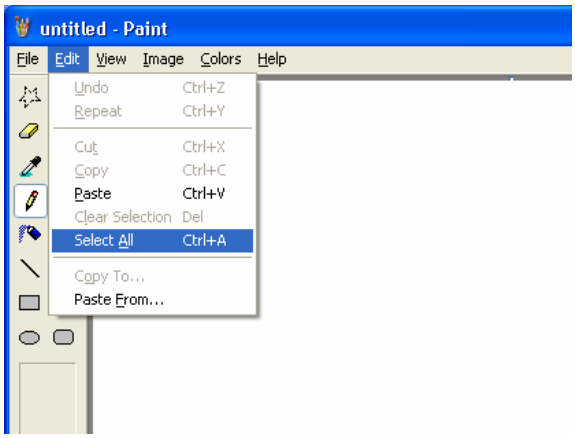


FIG: 2.42 Windows Paint

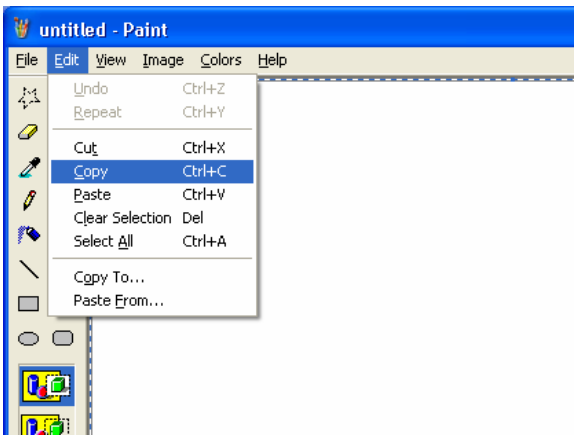


FIG: 2.43 Copy

At this point, you could use the MFGRAB program to save your logo. We will look at this later. What we want to look at now is if you already have an existing graphical image, how do you use this image to create a logo.
The problem is to get your existing graphical image to match the criteria of being twice as wide as high and having a border around it. You could put it into a drawing program and try to get it to fit. I like to us Microsoft WORD.
The first step is to insert the image into the WORD document. To do this, open a new WORD Document. On the Menu Bar, click on Insert -> **Picture -> From File** … An Insert picture dialog box will come up.

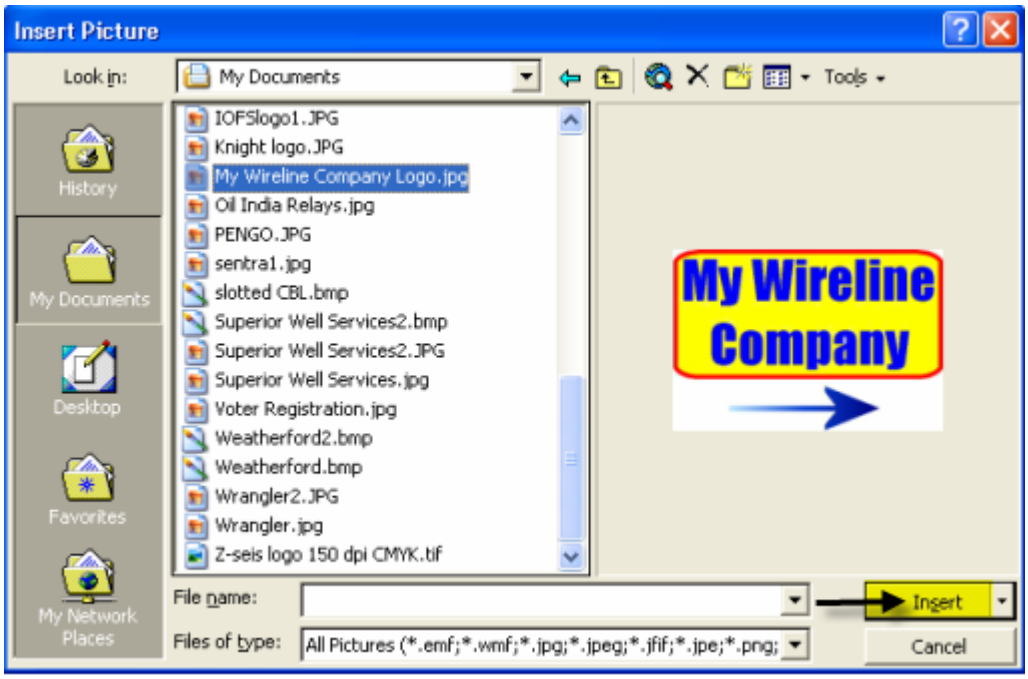


FIG: 2.44 Insert File

You can use the Look in: dropdown list to choose the drive or folder that the file is located in. Click on the image file that you wish to make into a logo. Then click on the Insert Button. Your selected image should now be in your word document.

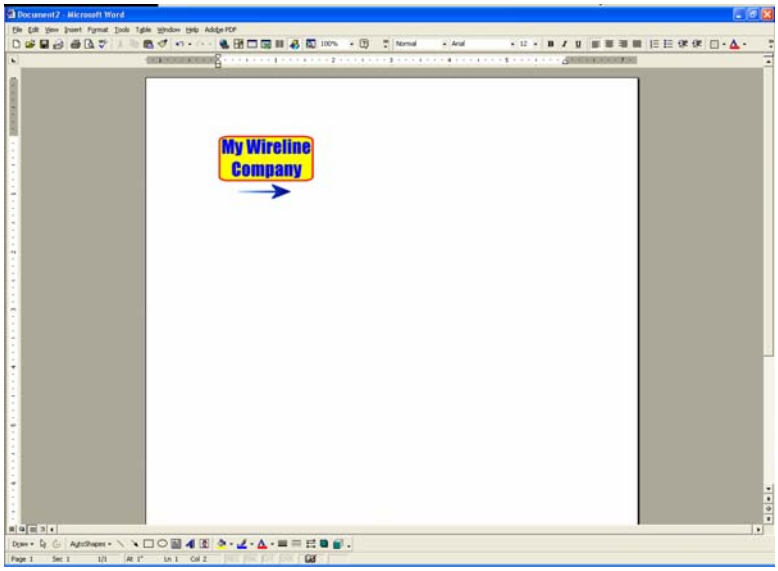


FIG: 2.45 Insert in Word document

Next we need to create a box to put the logo into. If the Drawing Toolbar is not at the bottom of the WORD window, click on **View -> Toolbars** and click on **Drawing** to activate the drawing toolbar. Look on the drawing toolbar and click on the rectangle. Now use the cross hairs of your mouse to draw a rectangle on the WORD document. When you have the rectangle drawn, right click inside the rectangle and choose the Format Autoshape choice.

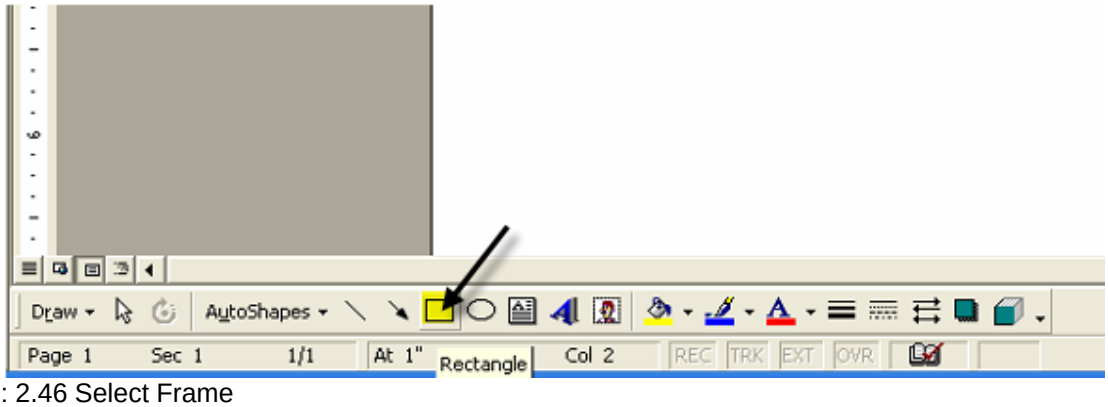


FIG: 2.46 Select Frame

There are several things that we need to do to format the rectangle. First select the Colors and Lines Tab. Set the Color to No Fill. The line defaults are Color - **black, Dashed – solid, and Style – single** line. Change the line weight to 2.

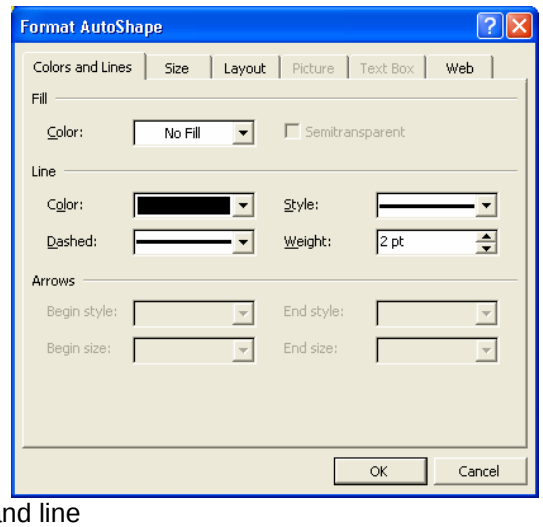


FIG: 2.47 Select me color and line

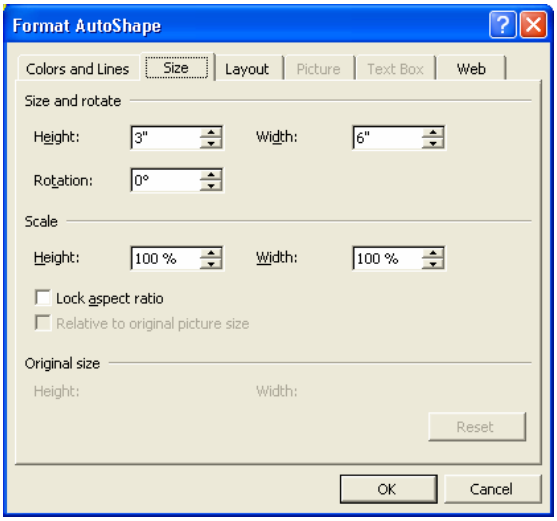


FIG: 2.48 Set Frame Size (3x6)

Next, click on the Size tab and set the **Height** and **Width** to your desired dimensions. Three inches by six inches work well form most logos. Your WORD document should now have your logo image and the box on it.

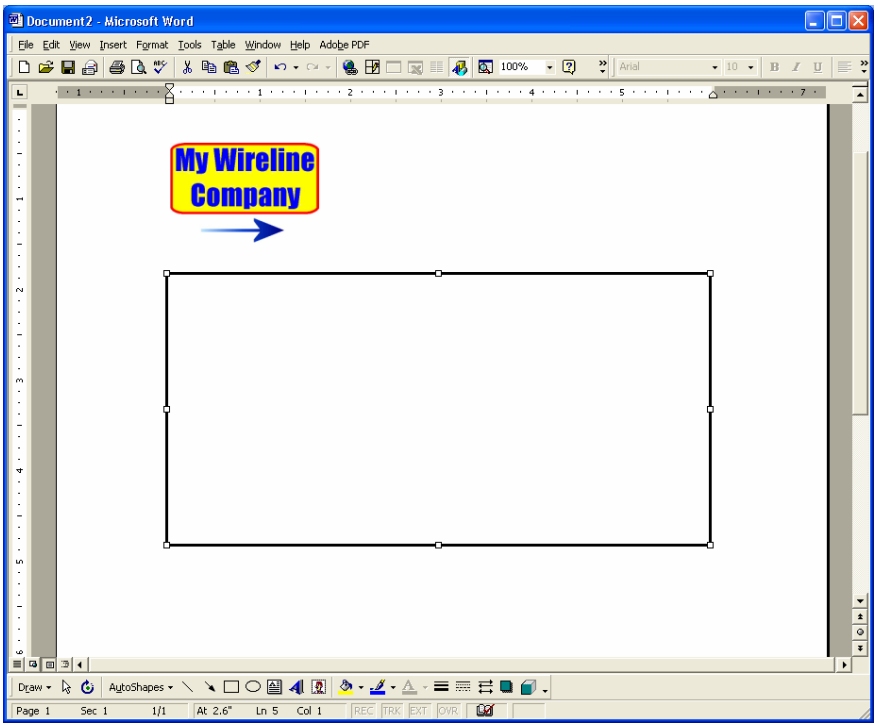


FIG: 2.49 Setup Frame

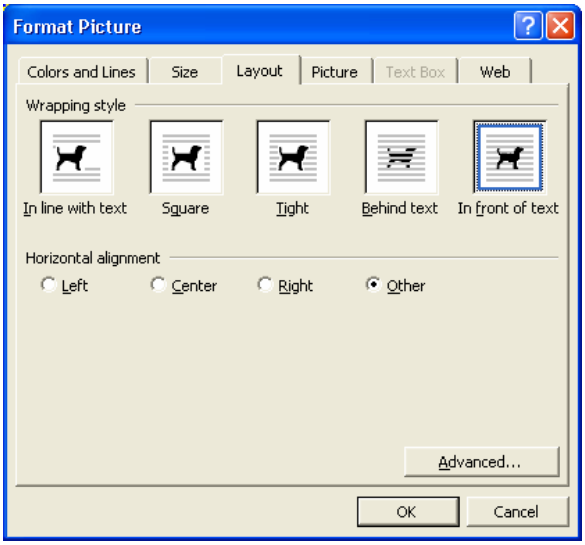


FIG: 2.50 Layout Picture

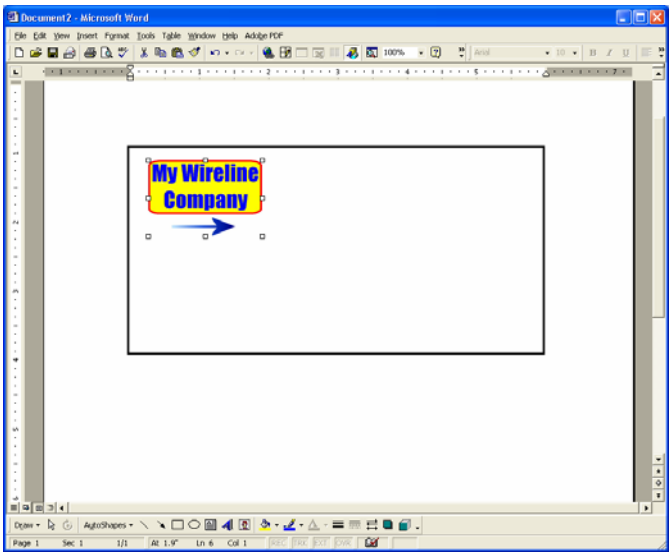


FIG: 2.51 Set picture into the Frame

Next we need to move the image and size it to fit into the box. Right click on the image and choose Format Picture. Then click on the Layout tab. Choose the right most icon, In front of text, and click OK. Your image should not be surrounded by squares. If you position the mouse on the image and click and hold the left mouse, you should be able to reposition the image. If you move the mouse to one of the squares and click and hold the left mouse, you should be able to resize the image. Move and resize the image as needed so that it fits into the logo box.

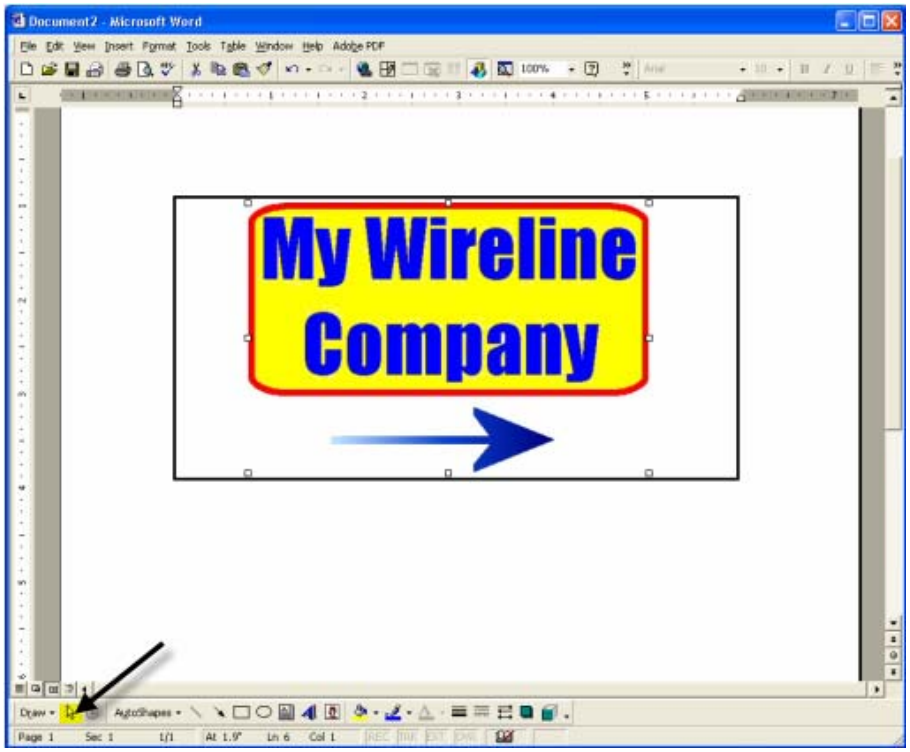


FIG: 2.52 Resize Logo picture

Now the image is in the box but we still have a bit more to do. On the drawing toolbar, click on the select objects arrow. Then use your mouse to make a rectangle around both the image and the logo box. Both the image and the logo box should have the resize rectangles on them now. On the drawing toolbar, click on Draw and select Group. The resize rectangles should only appear on the logo box.

At this point, you can right click on the logo and select Copy. Or you can select Edit on the Menu Bar

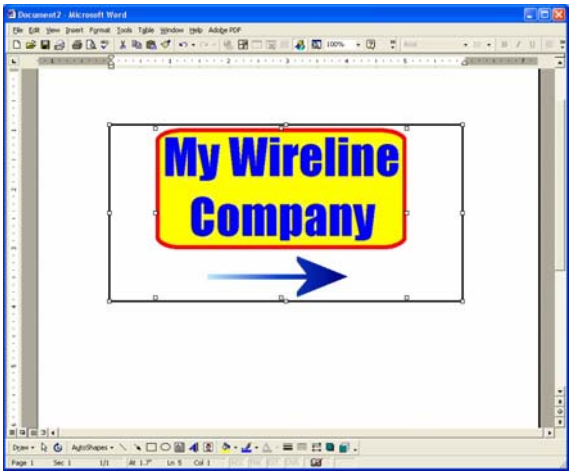


FIG: 2.53 Copy Logo

and select Copy. This copy action has copied the logo that you have created to the Windows Clipboard.
You will find MFGRAB.EXE in the Warrior\Bin32 folder. You can use Windows Explore to find the program and execute it or you can use the Start Button – Run option to find the program and execute it. It should show the logo that you have created.

FIG: 2.54 Execute MFGRAB

FIG: 2.55 Save file in warrior

To save the logo, Click on **File -> Save As** . . . You will get a dialog box in which to enter the logo file name. The path must be C:\warrior\config\. The file name must be an 8 character or less DOS compliant file name with the .LGO extension. In the example below, NAME would be the DOS file name.

FIG: 2.53 Create a path to save the file

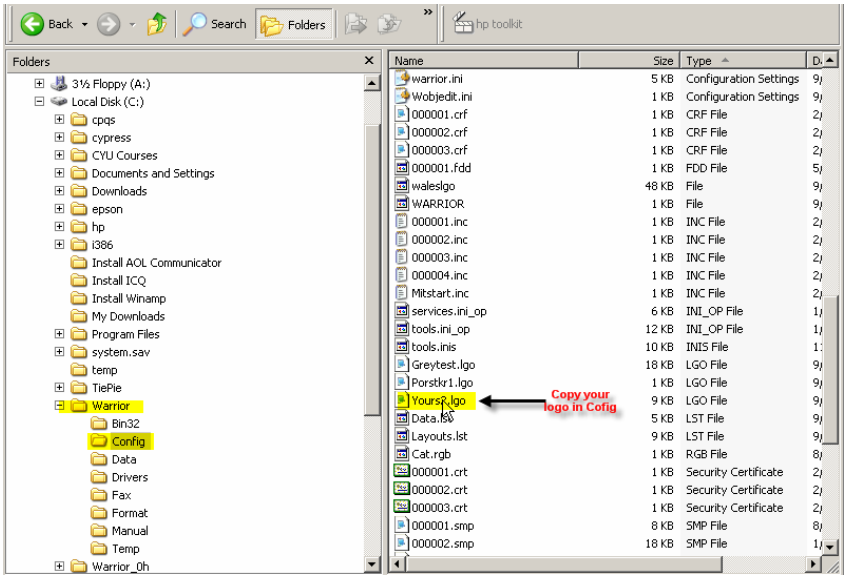


FIG: 2.54 File Logo Path

Double Click over your Warrior.ini

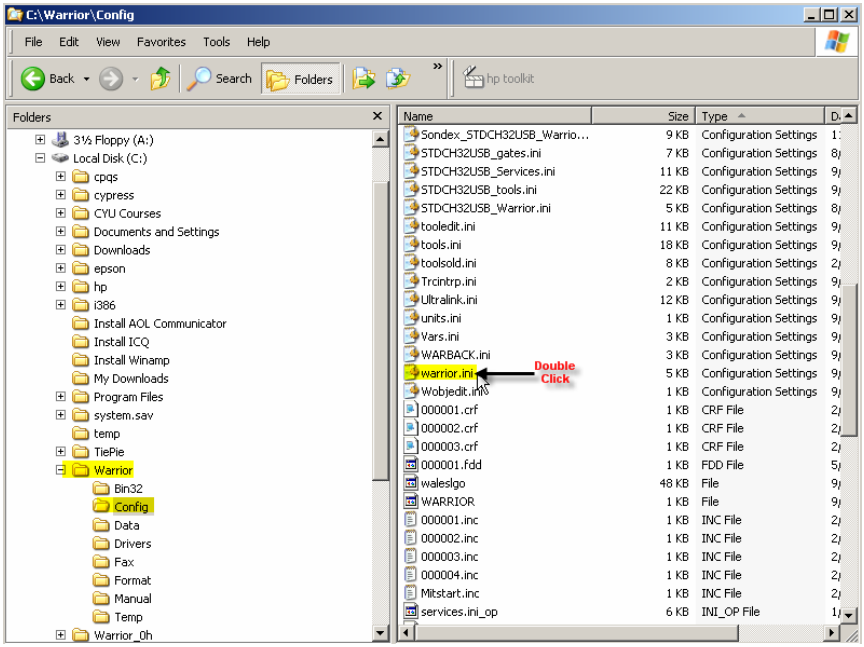


FIG: 2.55 Warrior.ini

Finally, in order to use the logo, we must declare it in the Warrior\Config\Warrior.INI folder under the heading section as shown:

```
[Heading]
default=StdCased.hdg
Logo=NAME.lgo
```

StdCased heading uses the picture name Logo, which is defined here. Different headings may use different picture names, but that will not be discussed at this time.
Copy your logo under Warrior\Config

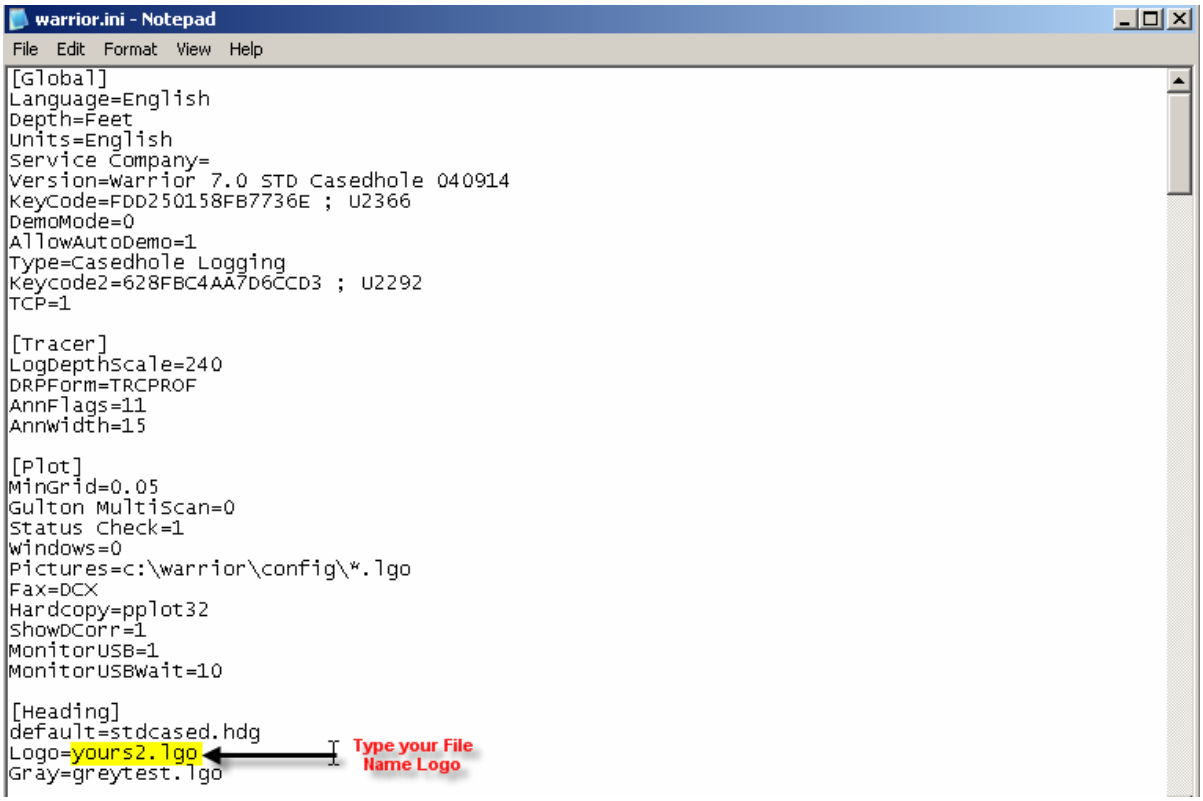


FIG: 2.56 Warrior.ini

Save the File

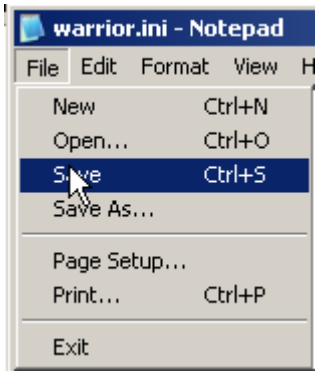


FIG: 2.57 Save

2.11 Warrior Convert for OLD version 7.0

Convert files from previous versions 7.0 - 051114 to the new ones 7.0

2.11.1 If you Upgrade your old version

Go to Warrior\Bin32\WarConv.exe

FIG: 2.58 Select WarConv

Double click over WarConv

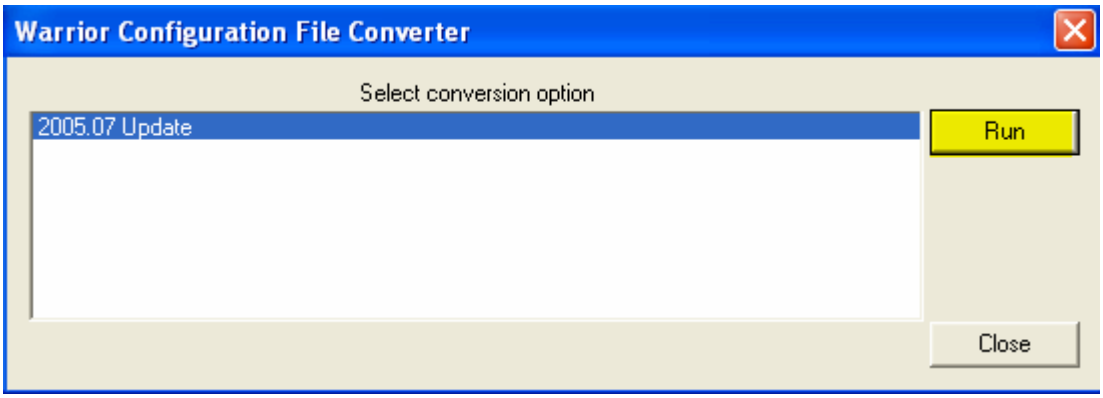


FIG: 2.59 Run Warrior Configuration File Convert

Select 2005.07 Update
Click on **Run**

2.11.2 If you perform a new version and you have the old configuration, Files

Restore the Old Configuration files version 7.0
Go to Warrior\Bin32\WarConv.exe

FIG: 2.60 Select WarConv

Double click over WarConv

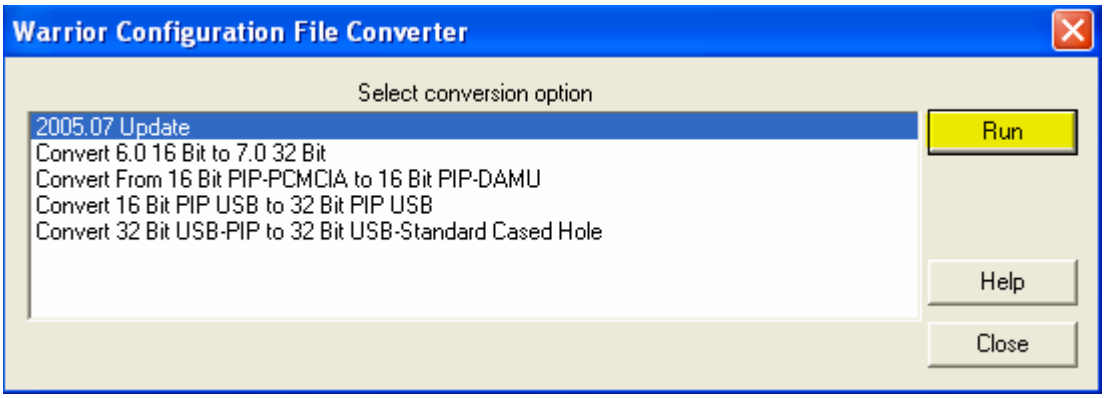


FIG: 2.61 Run Warrior Configuration File Convert

Select 2005.07 Update
Click on **Run**

Section

3

3 Warrior Control Panel

The Control Panel sets certain global characteristics of the Warrior system. The Warrior Control Panel is started from its icon in the Warrior program group or via the Windows Start button.

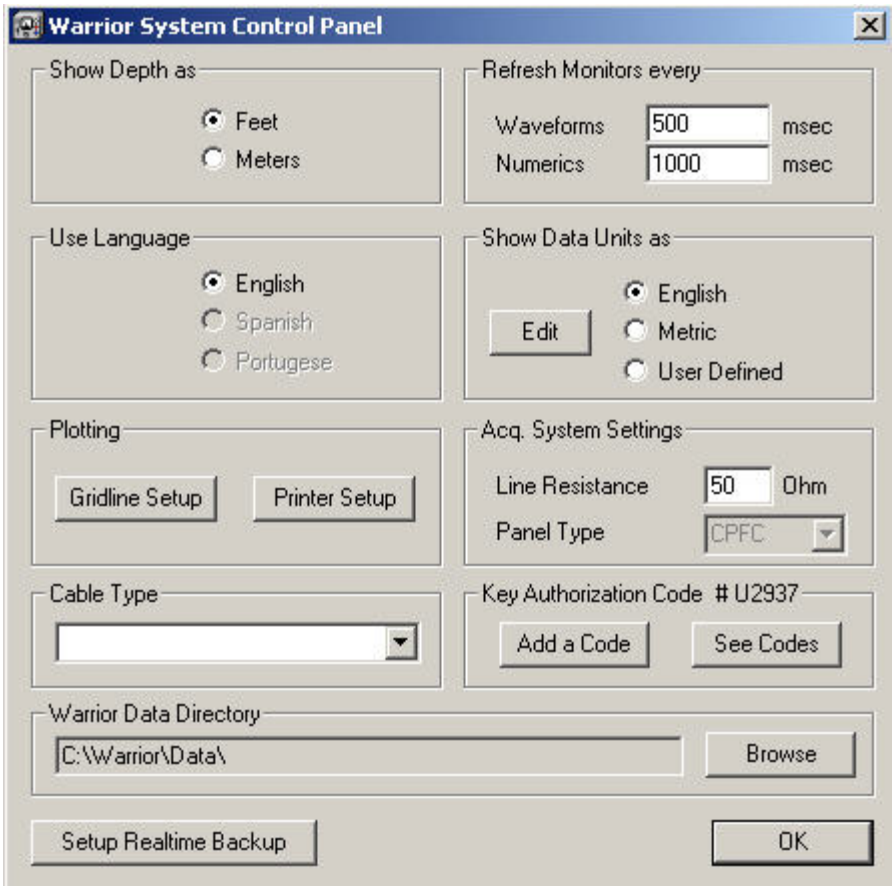


FIG: 3.1 Warrior Control Panel

3.1 Show Depth as

These option buttons in the upper left set the default depth units for the system.
The choices are Feet or Meters.

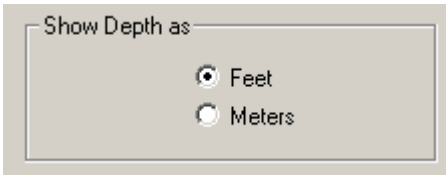


FIG: 3.2 Depth units

3.2 Use Language

These option buttons set the language of the user interface for the system. Several choices are expected to be available shortly.

FIG: 3.3 Languages

3.3 Refresh Monitors every

These text boxes allow control over the rate of screen refresh for numerical and graphical data monitor displays (waveforms). Waveform is set to 500 msec. and numeric is set to 1000 msec. by default. The minimum value currently accepted is 100 msec. Updating at a high rate tends to make the monitors difficult to read and the 1000 msec. refresh rate is a good compromise.

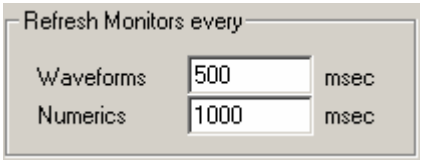


FIG: 3.4 Refresh Monitors every

3.4 Show Data Units as

These buttons allow selection of the default units system. The system allows three sets of data units, namely English, Metric and User Defined. The actual units for each selection may be edited by clicking the Edit command button making selections in the options box shown below.
The units for the various types of data and parameters may then be selected for a particular units map, accommodating occasions where a mix of English and Metric units may be required.

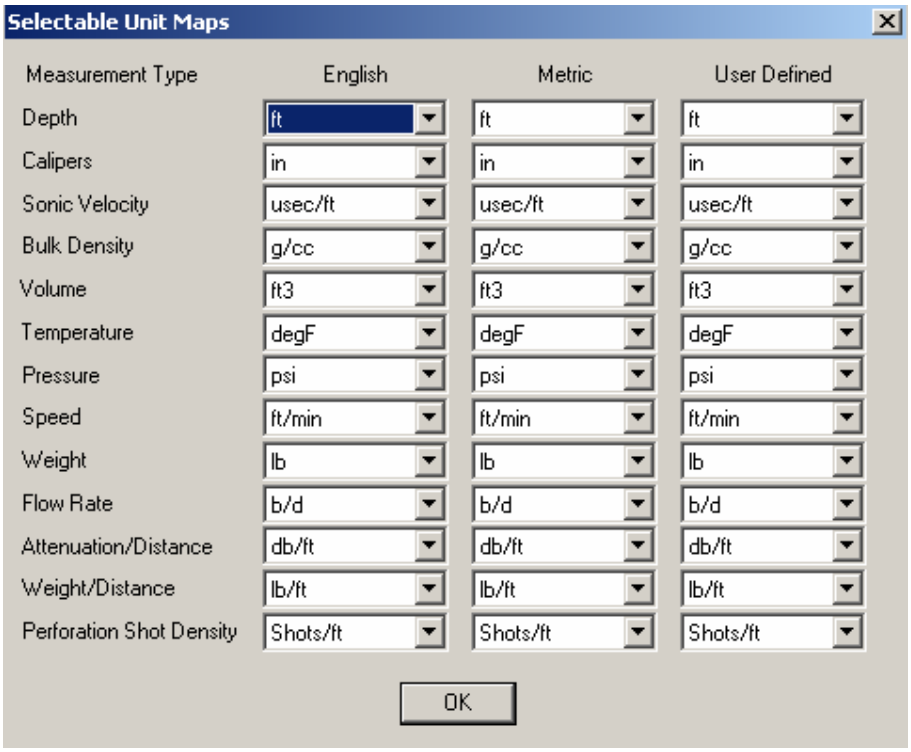


FIG: 3.5 Select Unit Maps

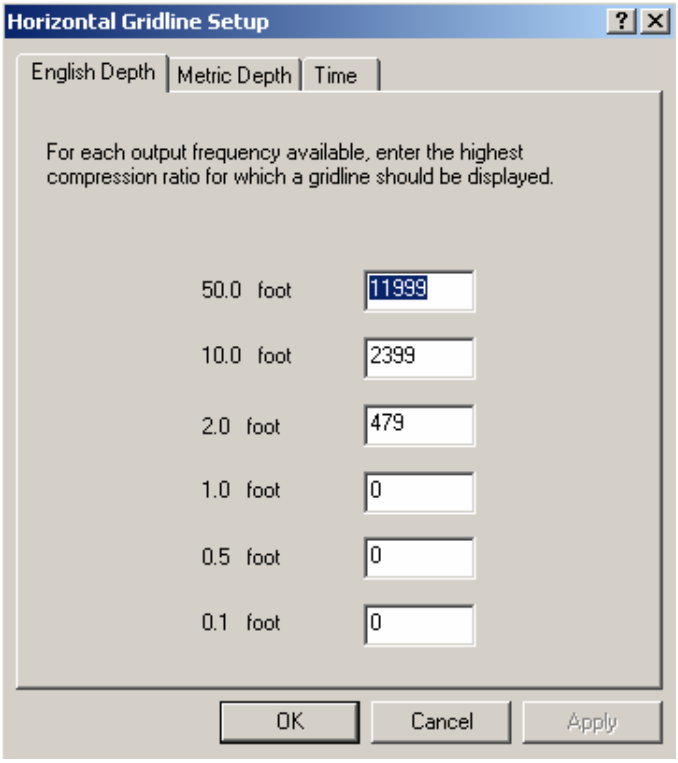


FIG: 3.6 Horizontal Gridline Setup

Set up compression ratios for gridlines.

3.5 New Authorization Code

This box is used for entering a sixteen digit Hex code for systems that have been installed with a software full time key. Some panels are release with Software time key it is valid for a specific duration of time (60 days). When the Key expires please Contact Scientific Data Systems for valid extension codes.
The second line we recommend type all the information about the Key number, Panel number, software version, and Unit number.

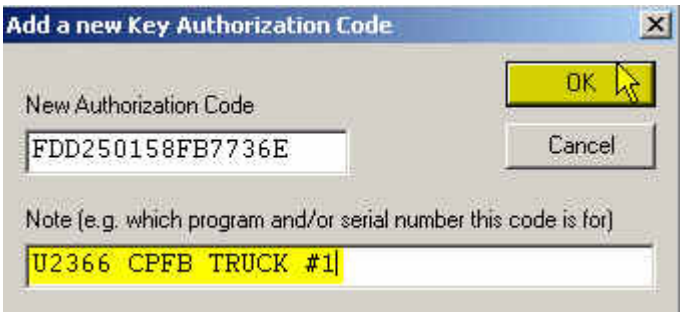


FIG: 3.7 Add a New Key Authorization Code

3.6 See Key Authorization Codes

FIG: 3.8 See Codes

Click on See Codes, you can see all the codes in your Warrior Software

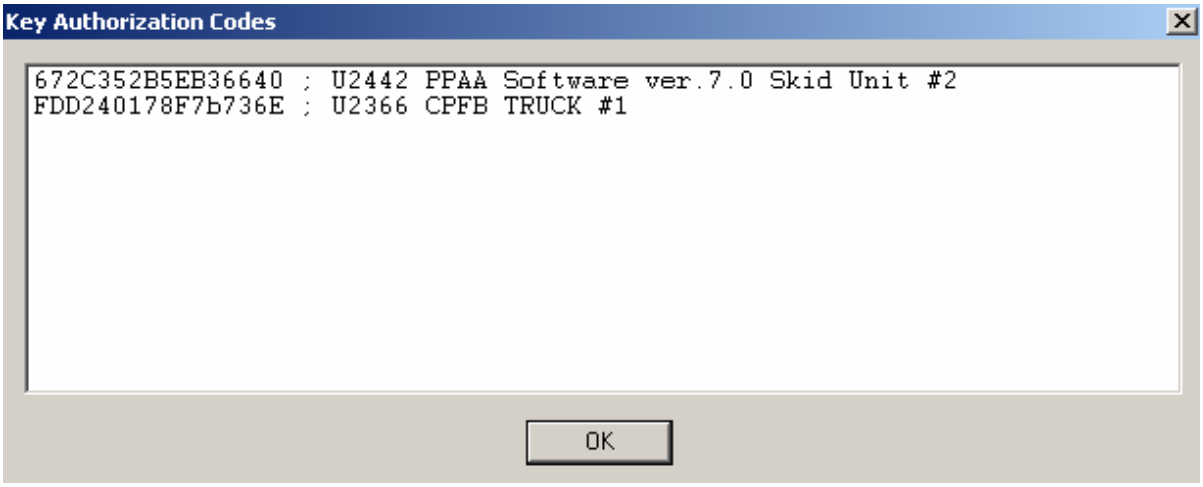


FIG: 3.9 Key Authorization Codes

3.7 Printer Installation.

3.7.1 Windows XP Printer Installation

To Facilitate this operation a USB Port has been assign on the Interface Panel (rear Plate) and marker “Plotter”. It is recommended to use this USB port for your printer connection.
Install the printer in windows XP first . The warrior software CD must be in the CD Device.
Plug in Belkin USB Printer Adapter cable into any available USB port.
Do not remove the Belkin USB printer from the chose USB port
Do not plug in the USB printer adapter to different USB port
Turn Printer On.

Select setting/Printers and Faxes

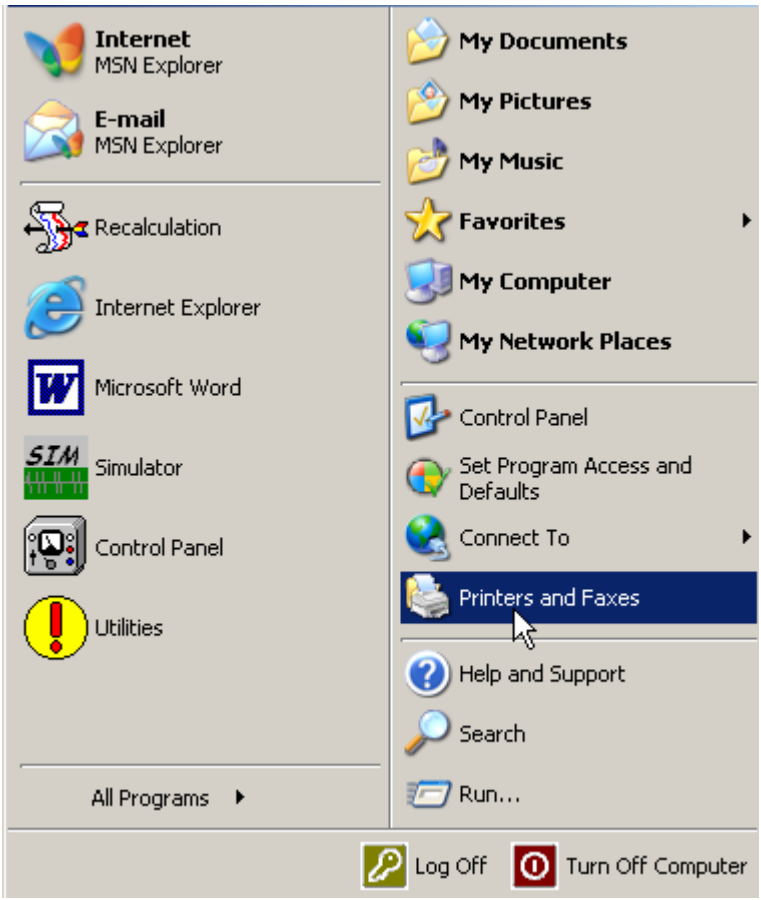


FIG: 3.10 Windows XP Control Panel

Select Printers and Faxes

FIG: 3.11 Printers and Faxes Window

Add Printer

FIG: 3.12 Add Printer Wizard

Select Next

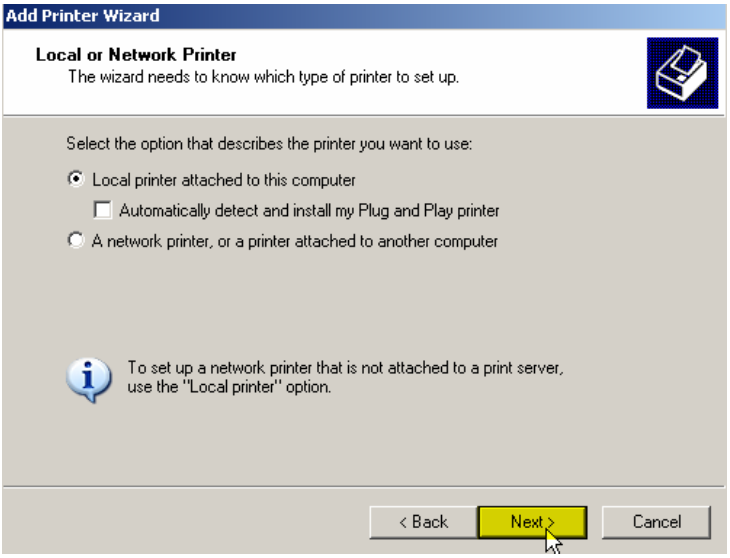


FIG: 3.13 Local Printer

Uncheck (Automatically detect and install my Plug and Play printer) and Select Local printer attached to this computer
Select Next

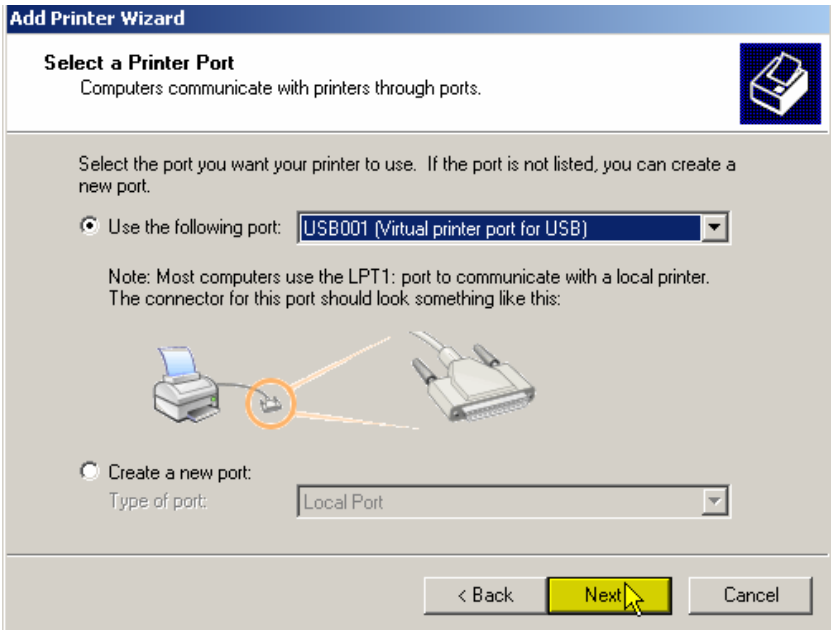


FIG: 3.14 Select a Printer Port

Select USB Port USB0001 to start.

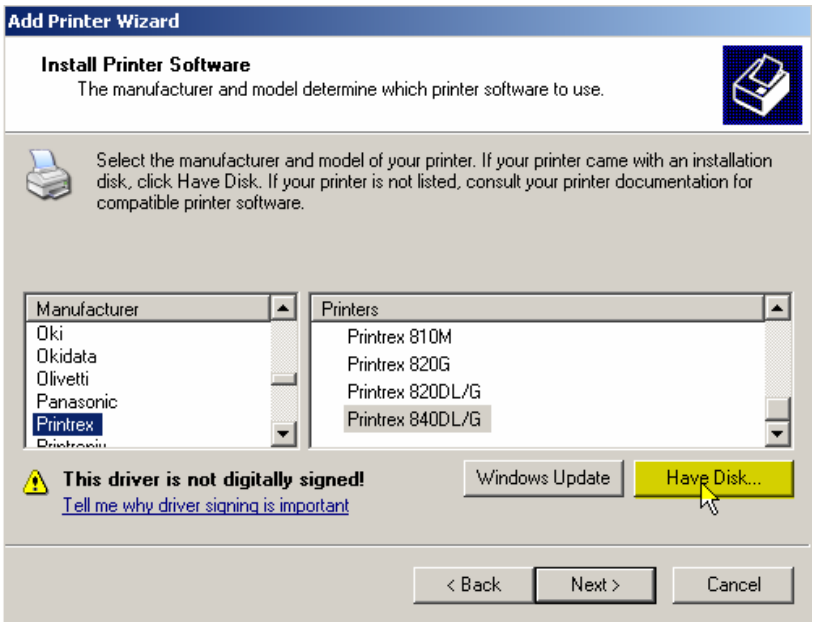


FIG: 3.15 Install Driver.

Select Manufacturer Printrex and Model Printrex 840DL/G the driver is in the CD select “Have Disk”

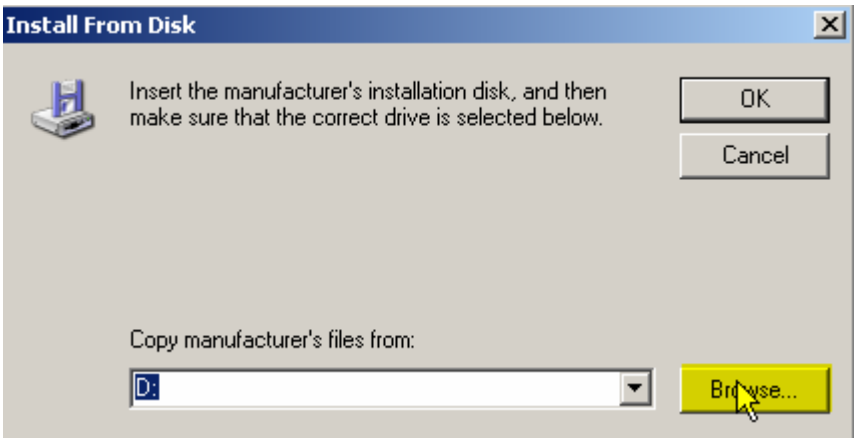


FIG: 3.16 Install from Disk

Select the CD Driver in this case is D: and “Browse”

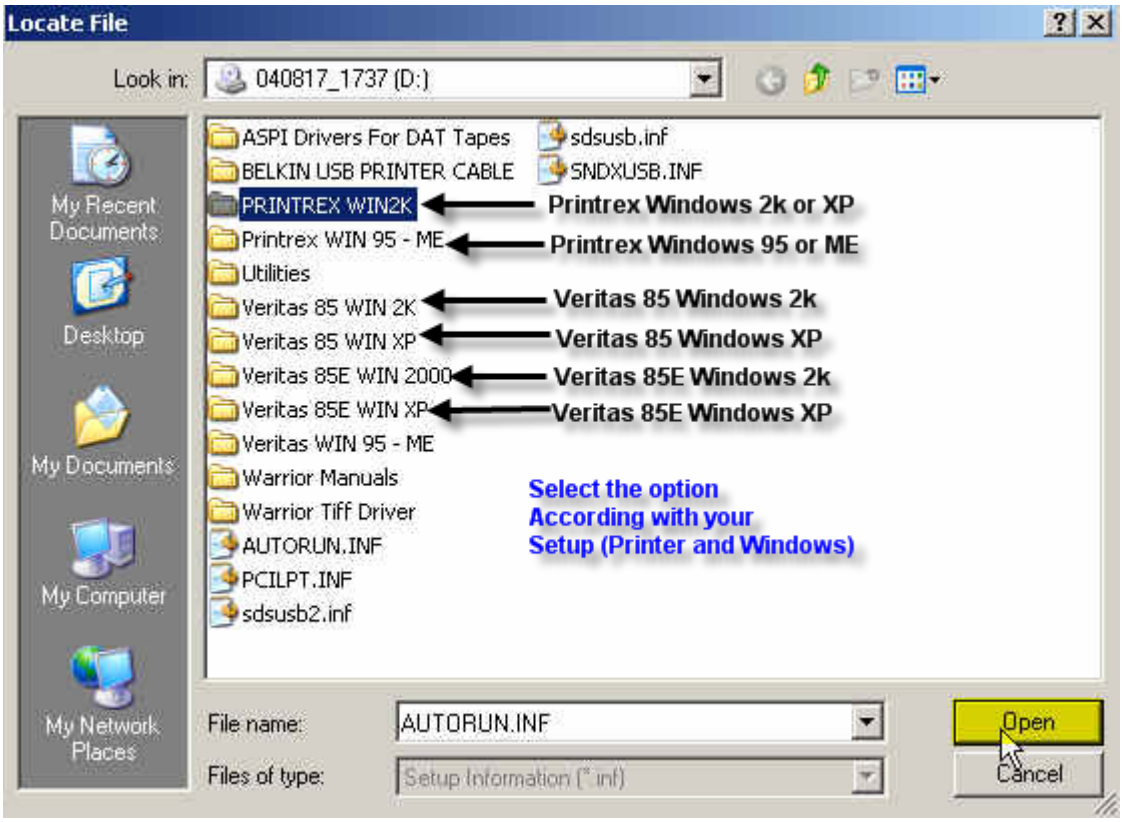


FIG: 3.17 Printrex Drives options.

Select the Driver PRINTREX WIN2K, this driver is to install in WIN2K and windows XP.

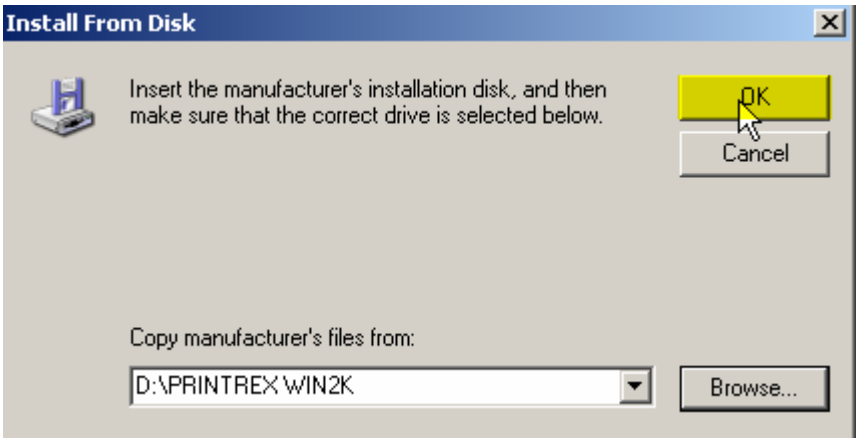


FIG: 3.18 Select the drive

Run the Drive

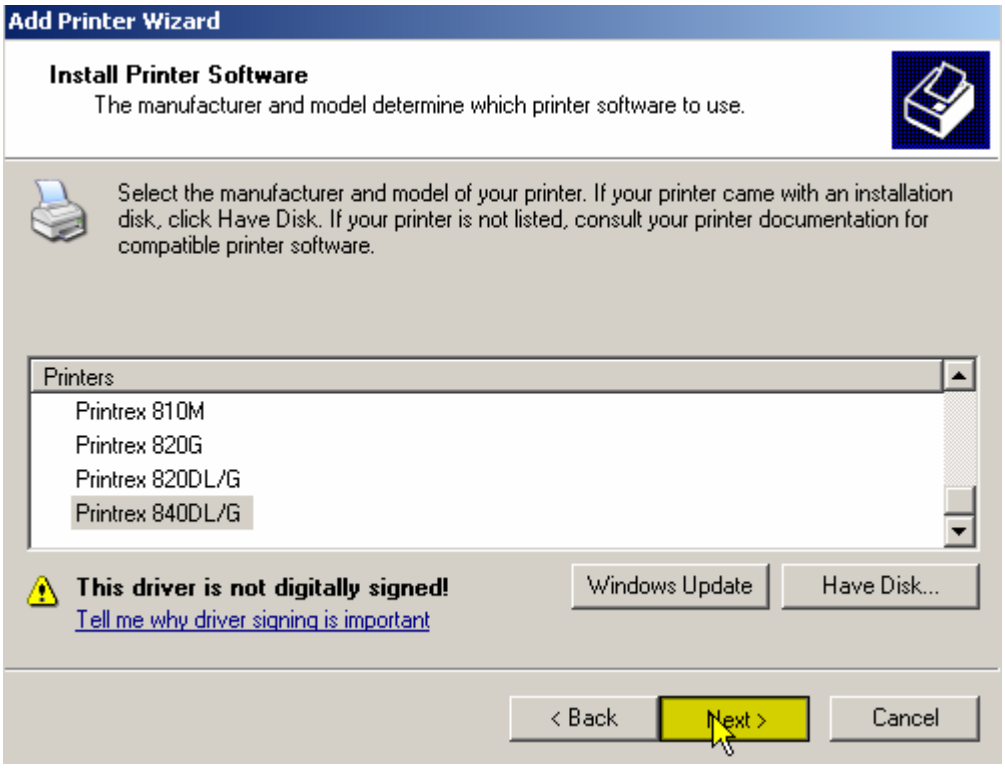


FIG: 3.19 Install the Printer Drive

Select 840DL/G or the model is connecting to the PC.

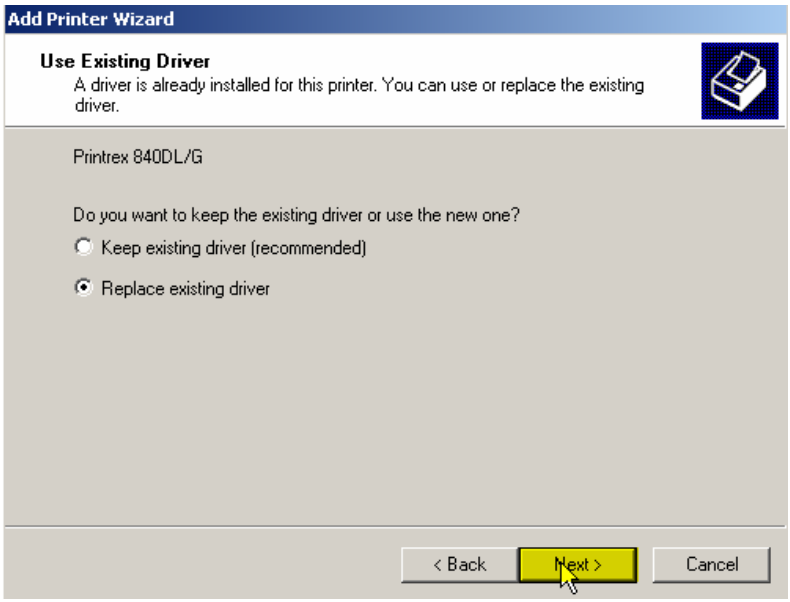


FIG: 3.20 Set the driver

Select replace existing driver

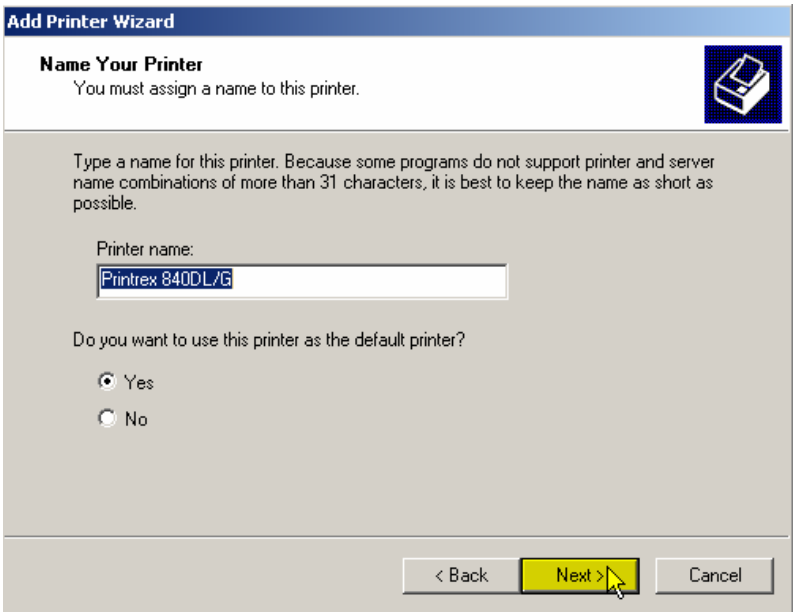


FIG: 3.21 Printer Name

Type the name or let the default Printer.

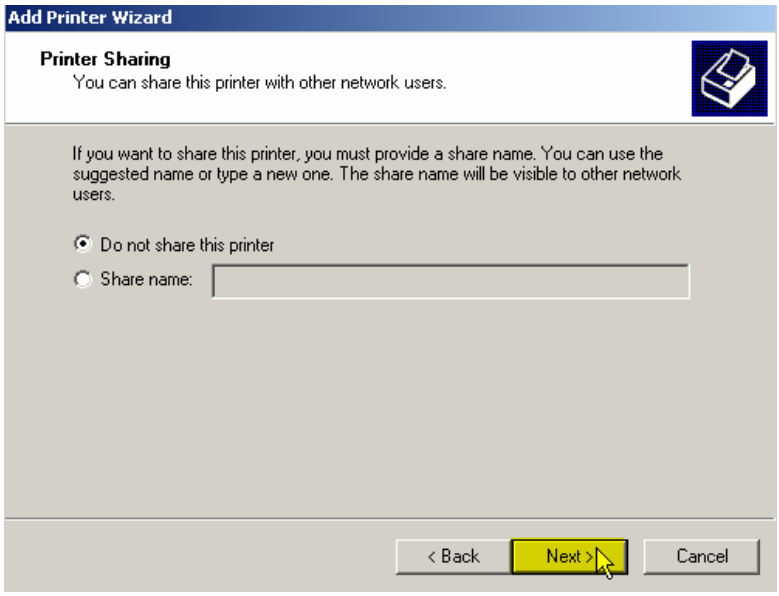


FIG: 3.22 Printer sharing

Select do not Share this printer

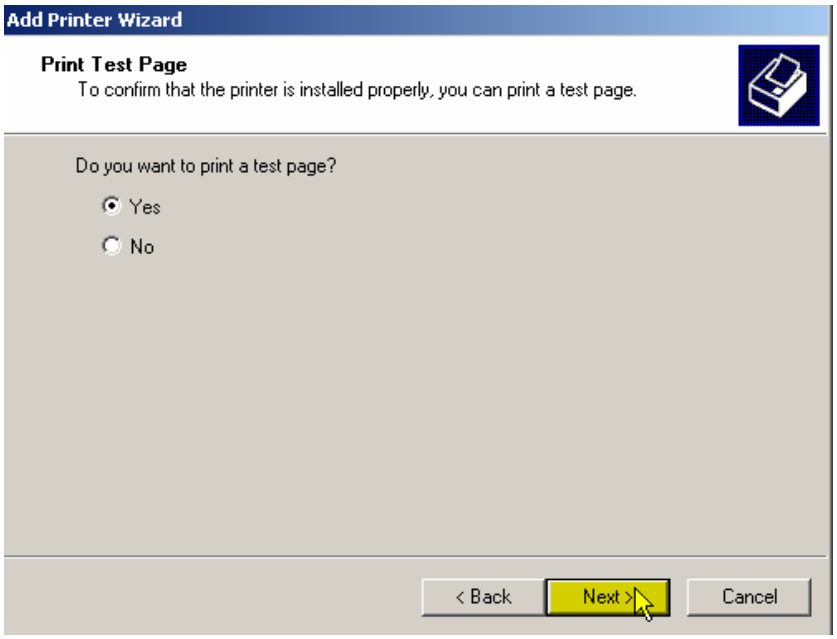


FIG: 3.23 Test Printout

Select Yes

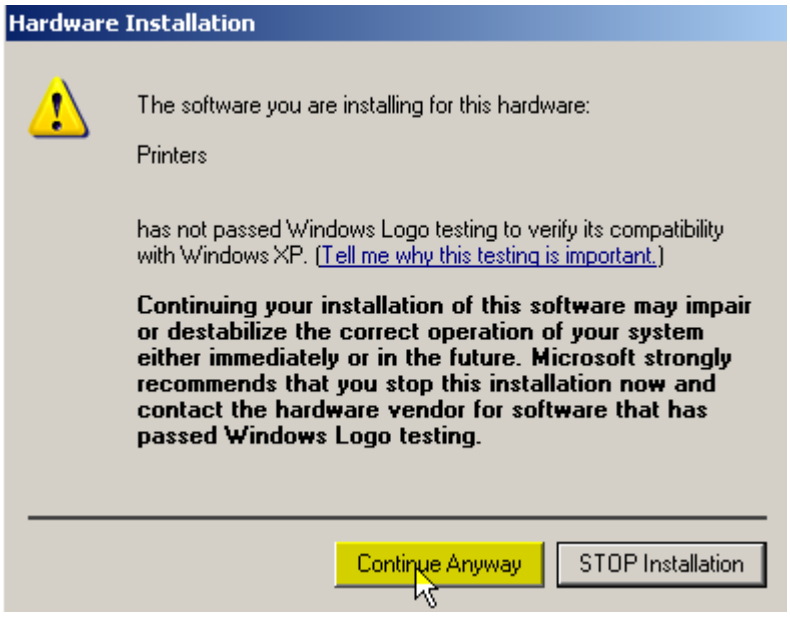


FIG: 3.24 Continuing Installation.

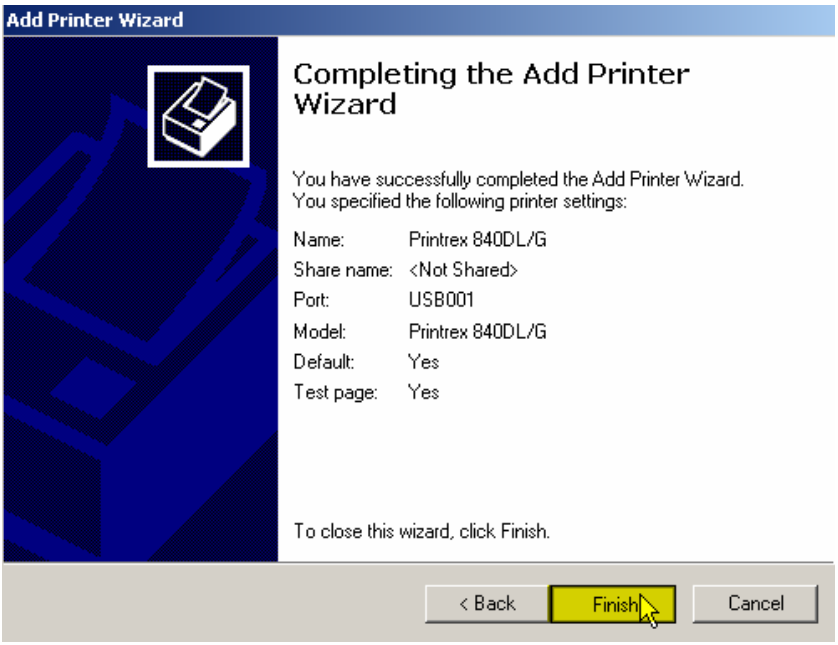


FIG: 3.25 Completing the Add Printer

Select Finish.

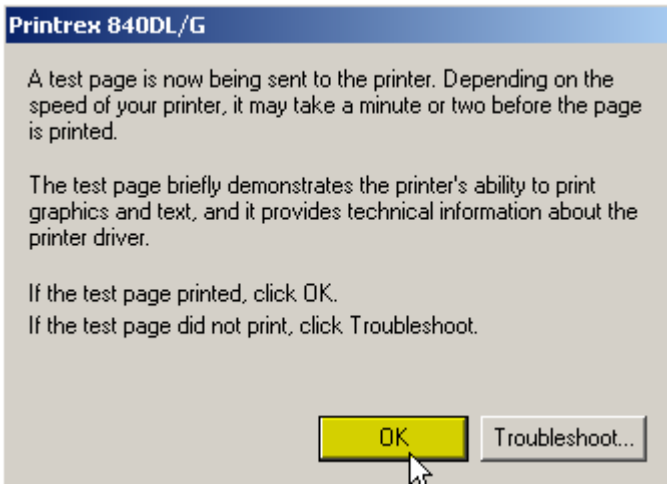


FIG: 3.26 Test Page

The Printer Test Page must appear. At this point the Printer is installed in windows XP and then select OK.

FIG: 3.27 Printers and Faxes

Check if the Printrex 840DL/G is set as default

VIDEO: 3.1 Printer Windows installation

3.7.2 Warrior Printer Installation

There are two different methods that Warrior uses to print. If you want a hardcopy of your log while you are logging, then you must print to a Direct printer. For good quality color prints, or to print to a printer that is not in the list of Direct printers, select the option Enable printing through Windows printer. If you have that button checked, then when you print from Warrior, you will see either (Direct) or (Windows) label for each printer in the list of printers to print to.
Selecting **Help** will bring up useful information about the settings for various printers, supported by Warrior.

3.7.2.1 Direct to Printer

Most printers, supported for Direct printing by Warrior, also have Windows drivers, so when a Direct Printer is installed; the Windows driver should be installed as well if there is one. Select a printer name, as would be done during a printer selection in Windows programs. Warrior can use the port properties you set up for that printer through the standard Windows printer setup, so the port name doesn't have to be specified in two different places. When a Windows name is specified, then the Port Name doesn't need to be changed in Warrior, as it will use the same port that is set up through your standard Windows printer setup.
The Port Driver should be set to port32 for all printers except the Gulton 250 and 275, which use the cenpoll32 driver, as they don't have any corresponding Windows drivers. When using Direct printing, settings, such as media type, plot speed, etc., are all controlled by Warrior directly, not by the Windows printer driver.
Recommended printers for color printing Direct:
Epson Stylus Color 900
Epson Stylus Color 1520
Epson Stylus Color 3000
Epson Stylus Color C60, C80, C82, C84
HP DesignJet 750C, 1050C

Recommended printers for monochrome printing Direct:
Printrex 840 DL/G (www.printrex.com)
ISys V8.5e (www.isys-group.com)

3.7.2.2 Printing through Windows Printing

Whilst logging, it is possible to print to a Windows printer. However, printing hardcopy of your log is not possible. SDS cannot guarantee that all printers will work properly for making prints from Warrior, therefore a list of tested printers, that are able to make continuous prints, is available. The Windows printing options are settings that may change from one printer to the next. However, most of the settings are set by SDS, so they should not be changed. Some printers place a large gap at the start of a print, so a print gap is added during start of print, so the first fan fold can be skipped and a distance can be added to get the <fold here> to come out in the right place.
When using Windows printing, settings, such as media type, plot speed, etc., are all controlled by the Windows printer driver.
Recommended printers for color printing through Windows:
Epson Stylus Photo 825
Epson Stylus Photo 890
Epson Stylus Photo 1280
HP designjet 5500
HP deskjet 5550
HP deskjet 6540
Isys Iterra Elite color LED *
Isys Iterra Lite color thermal inkjet *

Recommended printers for monochrome printing through Windows:
Printrex 820DL/G, 840DL/G
ISys V8.5e

(* Denotes printer can do multiple copies)

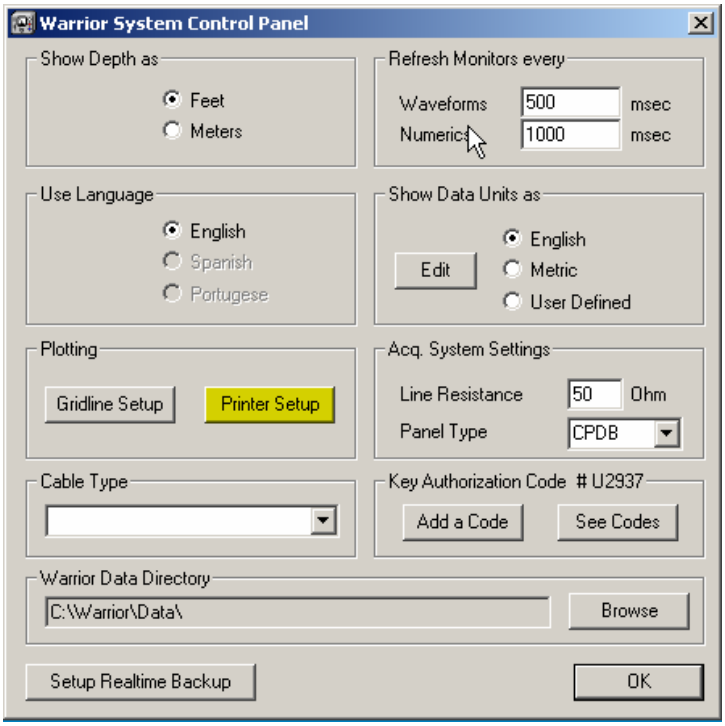


FIG: 3.28 Control Panel Printer Setup

Select Printer Setup

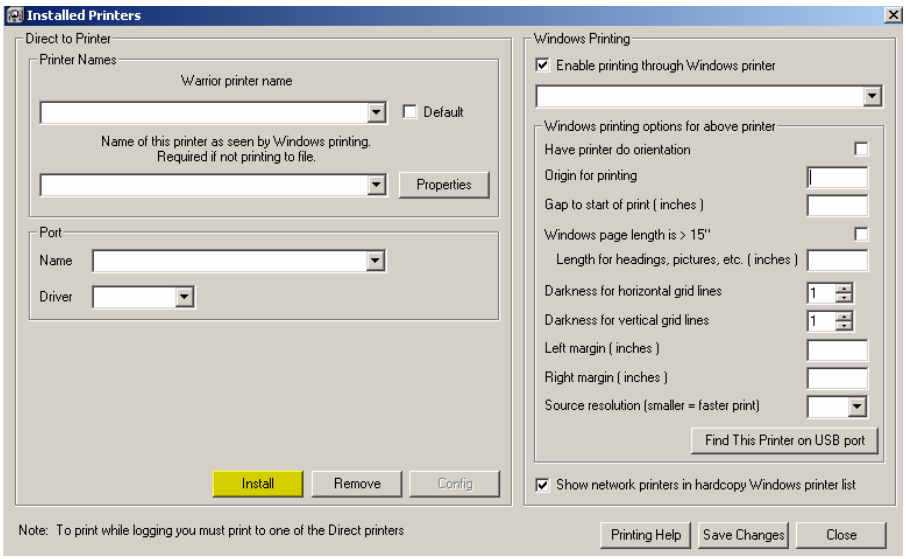


FIG: 3.29 Installed Printers

Some of the Windows printers may require a value to be entered for the “Gap to start of print”. Having a non-zero value will cause the printer to advance the paper that distance, so the first fan fold page may be blank in order to position the print head to the proper place.

Select the **Install** button for a list of printers, supported by Warrior,
for printing whilst logging. When this box is checked, either a (Direct) or (Windows) label for each available printer is shown when printing from Warrior. For fan fold printing, set the printer page size to twice the size of one fan fold page.

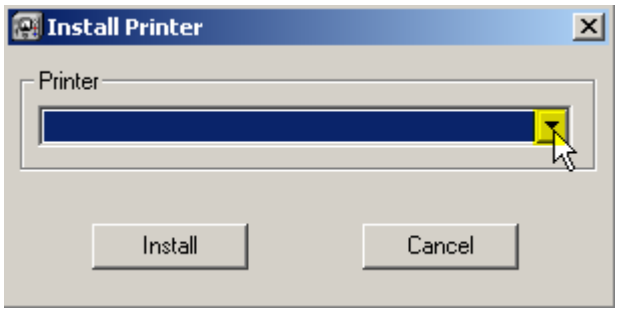


FIG: 3.30 Install Printer

Open the Drop- down box

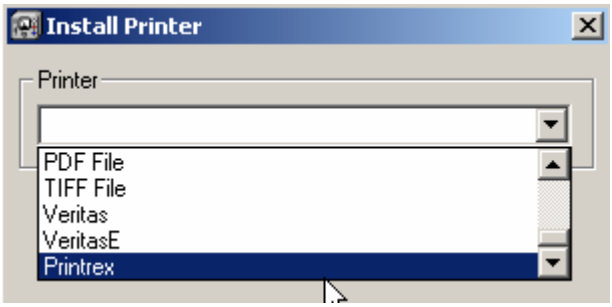


FIG: 3.31 Install Printer

Select Printrex

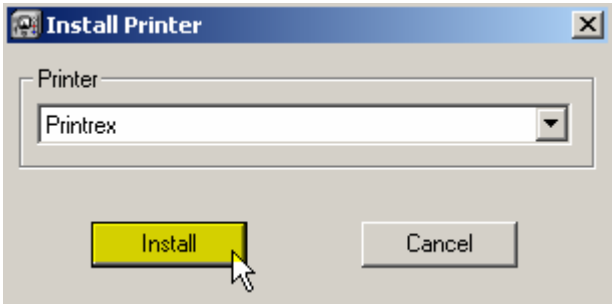


FIG: 3.32 Install Printer

Click over Install

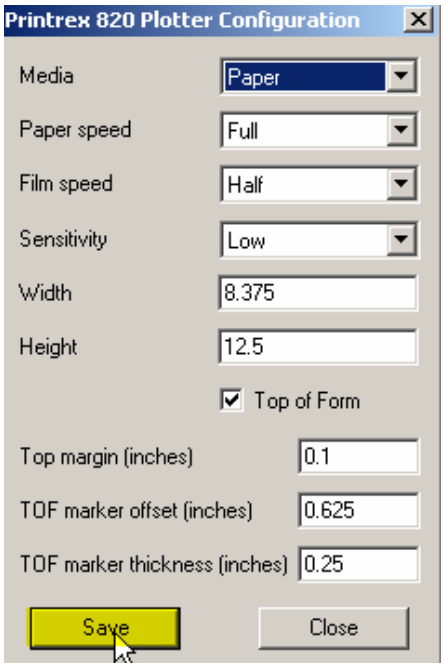


FIG: 3.33 Printrex 820/840 Plotter Configuration

For fan fold printing, set the printer page size to twice the size of one fan fold page

Select Save

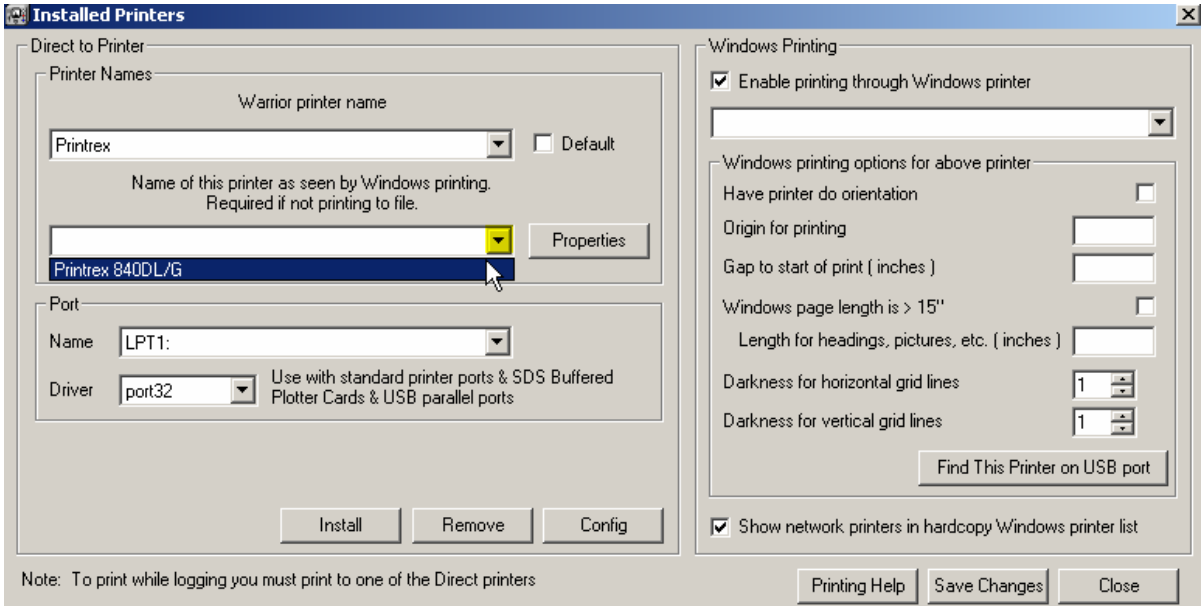


FIG: 3.34 Installed Printers

Select on the Drop-down the Printer Model Printrex 840DL/G

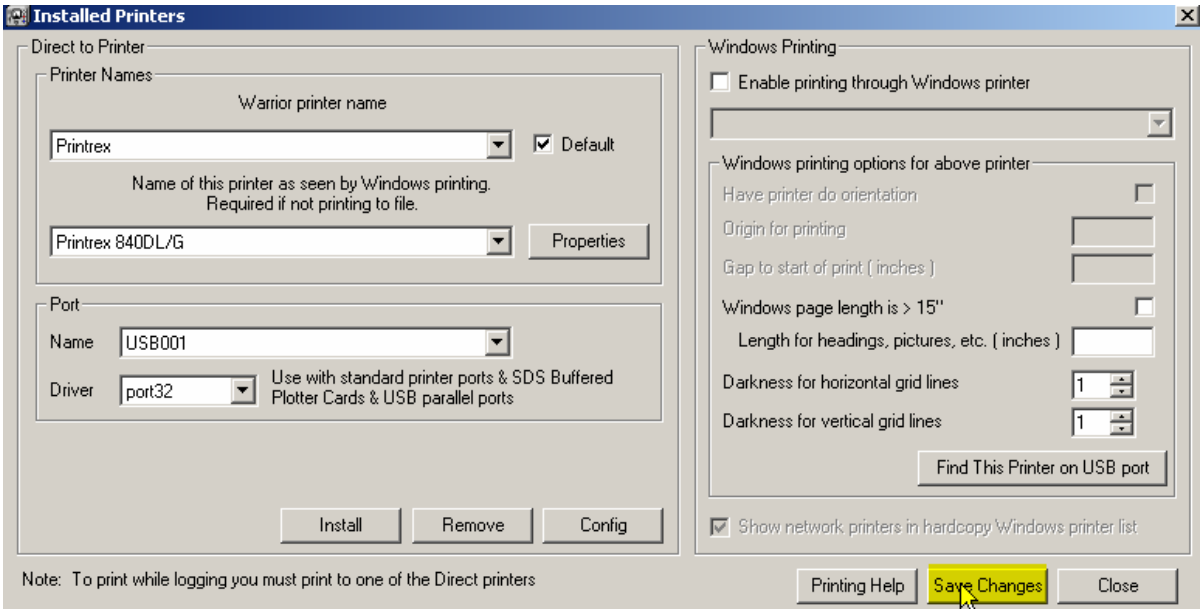


FIG: 3.35 Installed Printers

Select Save Changes

VIDEO: 3.2 Warrior Printrex Install

3.7.2.3 New Printers List

Printing help and Printers32.ini contain details of printers tested with Warrior. However, printers are constantly changing, so check the following link http://www.warriorsystem.com/Support_Printers_List.htm

COLOR PRINTING NOTICE: You will always get better color prints printing through a Windows color printer. None of the direct color printers were designed for printing continuous log prints. Unless you require color printing while logging, we recommend you use one of the Windows printers and not use Direct printing to a color printer.

Source Resolution: If it takes a long time to print to your Windows printer, try setting this to a lower value. The default is 1. A lower value may degrade the print quality, so test with your printer to find the optimal setting. You may be able to use a higher Windows printer resolution (600 or 720 dpi) and use a Source Resolution of 1/2 or 1/3 and still get a quality print.

3.7.3 Finding Printer

We recommend connect the Printer/Plotter in the same USB port but if you do not know which port is , you can find the USB port where the printer is connected .

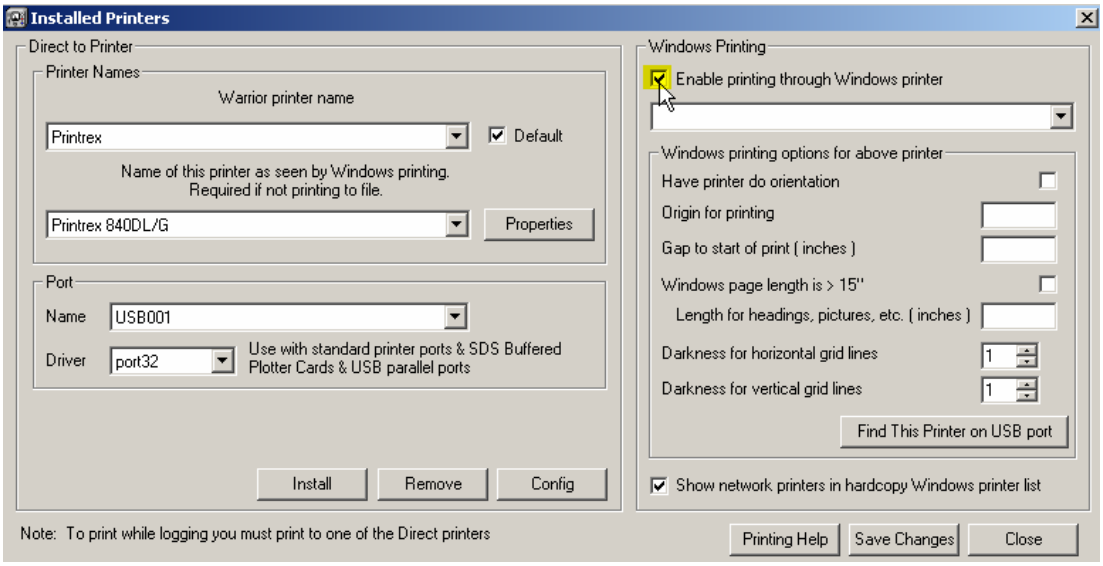


FIG: 3.36 Installed Printers

Check Enable printing through windows printer.

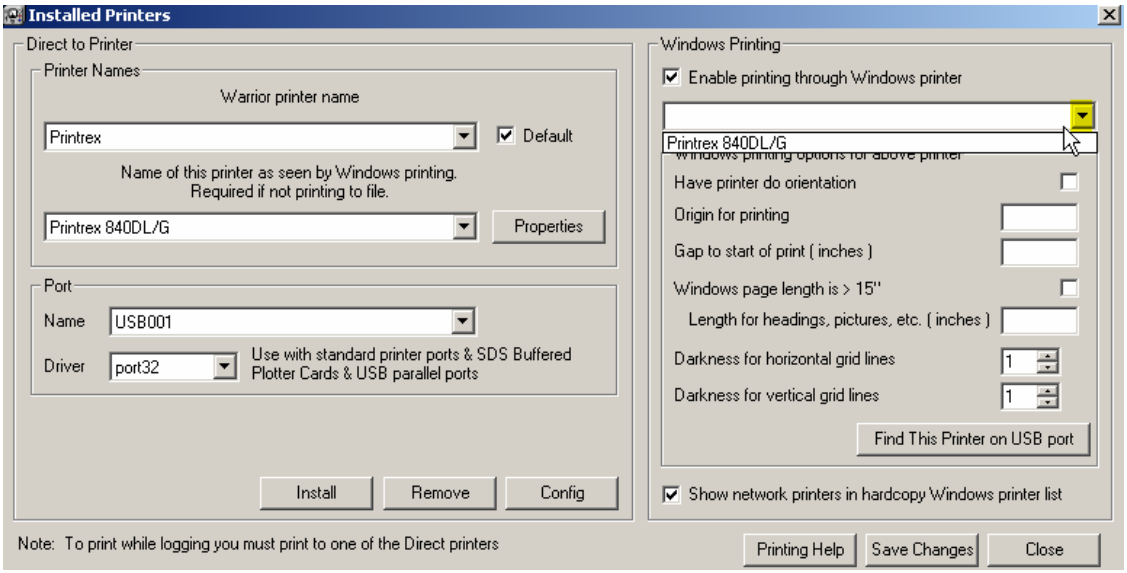


FIG: 3.37 Installed Printers

Select on the Drop-down the Printer Model Printrex 840DL/G

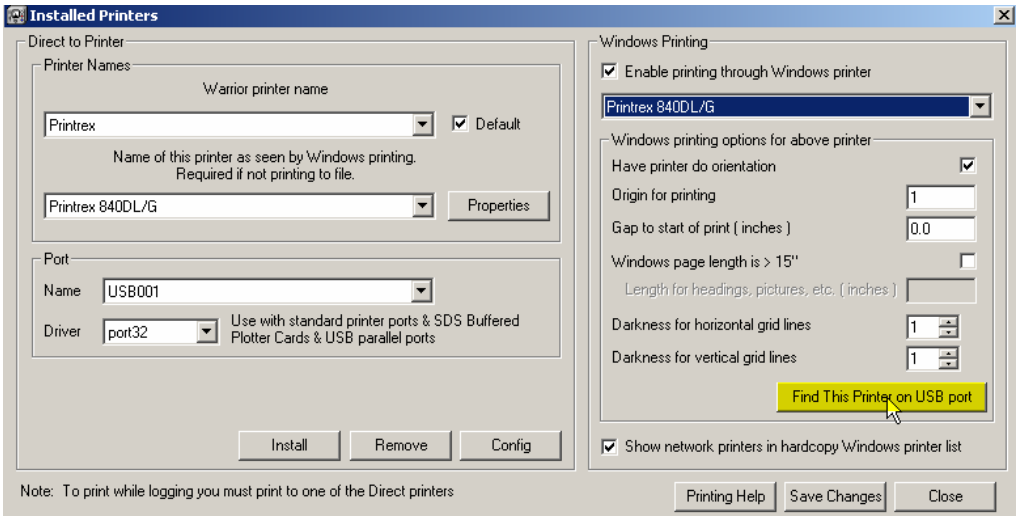


FIG: 3.38 Installed Printers

Select find this Printer on USB port.

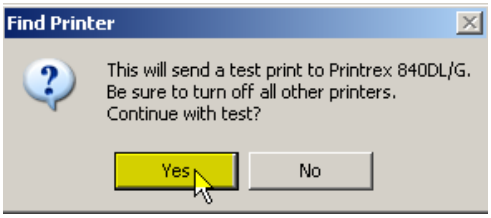


FIG: 3.39 Find Printer

Select Yes

FIG: 3.40 Testing Printer

If the test print comet out select Yes It means the printer is connect to USB002

FIG: 3.41 Printer Found

Select OK

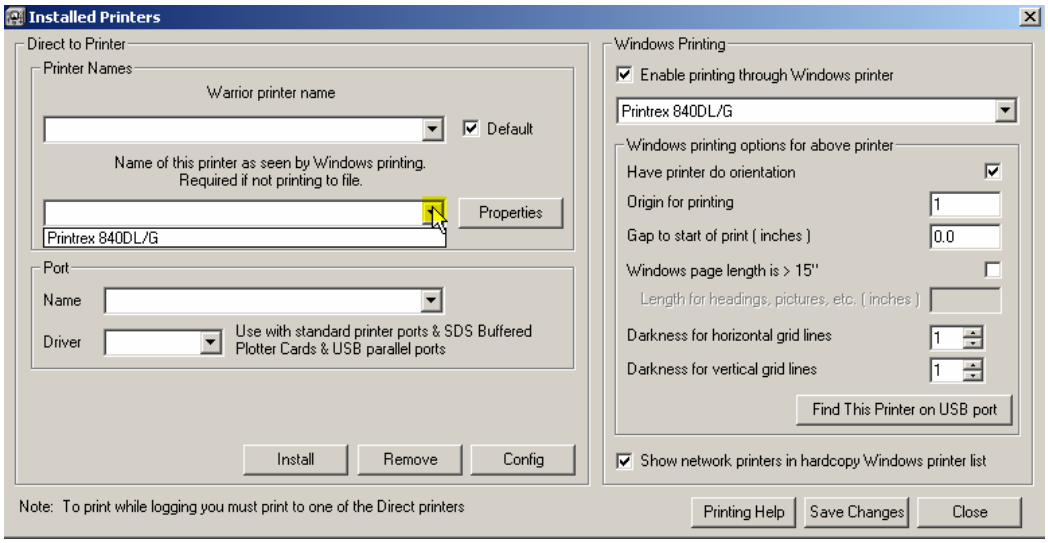


FIG: 3.42 Installed Printers

Select on the Drop-down the Printer Model Printrex 840DL/G

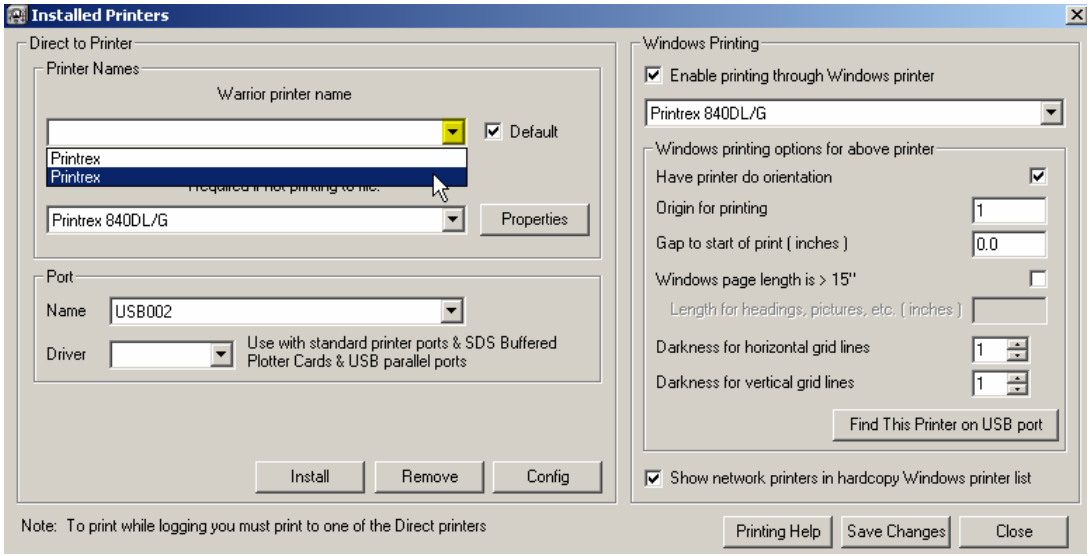


FIG: 3.43 Installed Printers

Select on the Drop-down Printrex

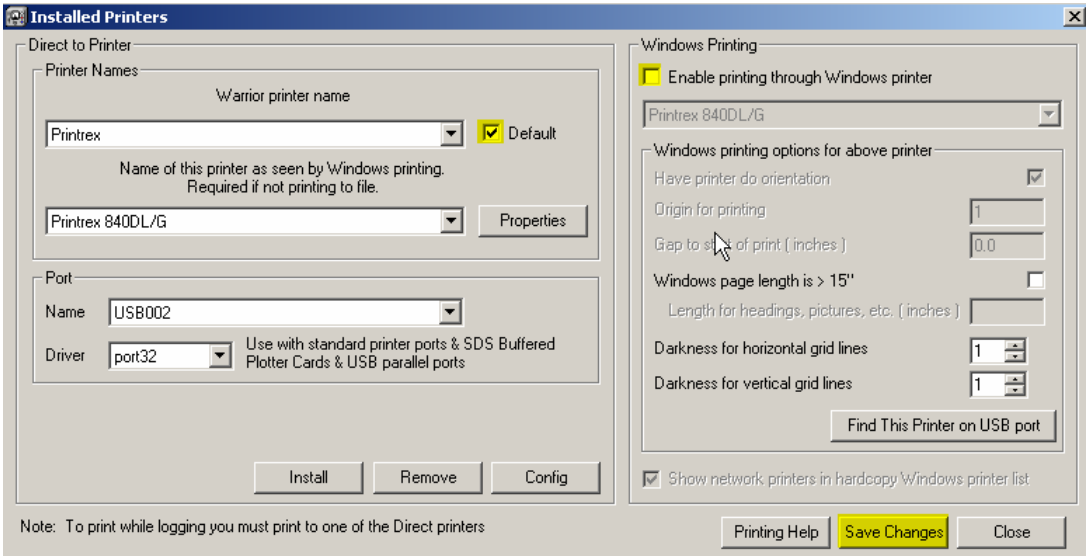


FIG: 3.44 Installed Printers

Uncheck Enable printing through Windows printer and select Save Changes

VIDEO: 3.3 Find Printers

3.7.4 Printing to PDF

Warrior supports direct printing to PDF files through its own driver. Before creating a PDF output, determine what the customer intends to do with the file and configure the PDF options accordingly.
If it is intended only to view the PDF on the screen, then the driver should be set to Continuous Viewable Image and Color. If the customer intends to print the PDF, then it should be set to Continuous Printable Image and Color or Monochrome, depending on the printer being used. In addition, it may be important to set the page size to match the page size of the customer's printer; otherwise gaps between pages can appear.
Furthermore, there is a trade off between file size and quality. The higher the dpi setting, the better the quality normally, but the file size is larger. Some experimentation may be required with the customer to produce optimal results. This is also true for the selected compression mode. For most situations, FLATE compression works well.

3.7.5 Printing to TIFF

Warrior also supports direct printing to TIFF files through its own driver. Again, determine what the file is intended for and configure the driver accordingly.
Note that the driver supports TIFF single continuous pages of longer than 90 inches. However, many TIFF applications (including Warrior fax) do not support this, so before increasing the maximum page length be sure that the customer can read such files.

3.7.6 Cable Type

Select the cable type according with logging unit cable if the cable it is not available select the close one, if help to select the values to equalized the signal on the cable.

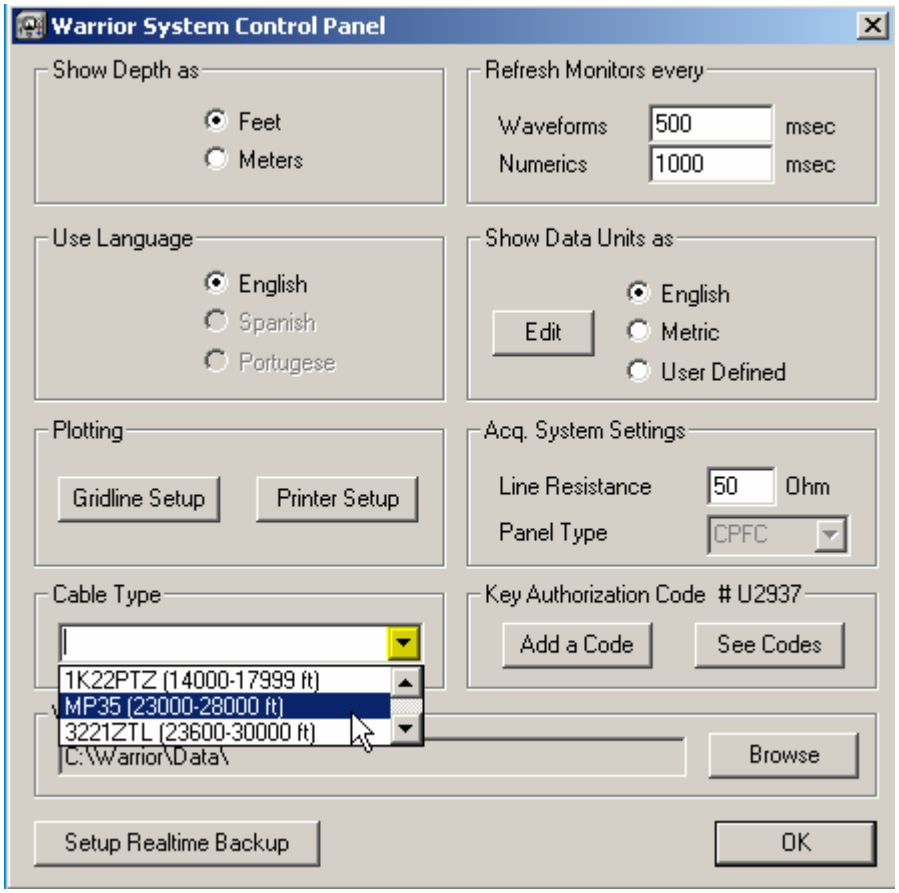


FIG: 3.45 Cable Type

3.7.7 Set Up Real Time Backup

The software has the options to storage the backup data in other directory or hard disk at the same time it storages the data in the Warrior\Data.

The software has three options:

3.7.7.1 No Real Time Backup

It just storage the data under Warrior directory or the path directory you select, this option is select by default.

3.7.7.2 Offer to Make Copy after each Pass.

At the end of each pass offer to make copy and storage in the Real Time Backup directory path you select.

3.7.7.3 Automatically make copy after each pass

Each pass will be automatically storage in the Real Time Backup directory path select by you.

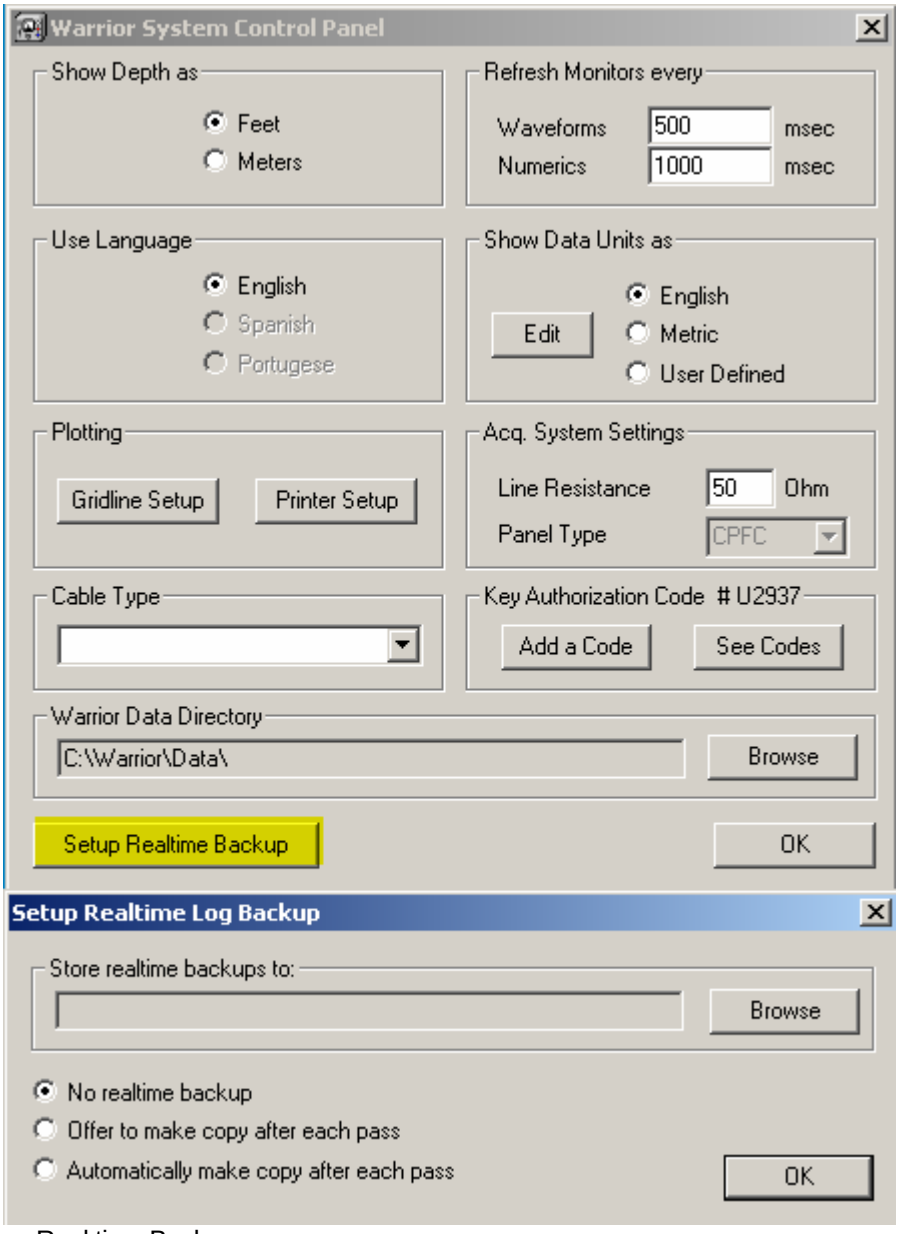


FIG: 3.46 Setup Real time Backup

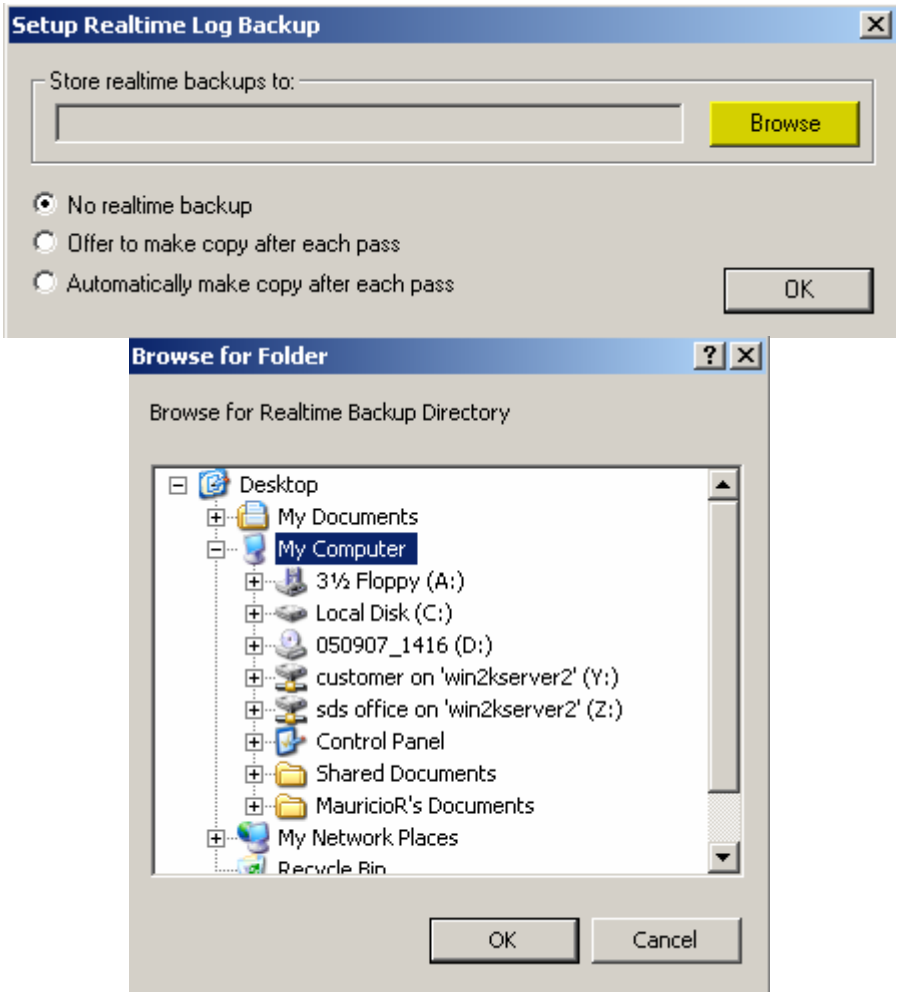


FIG: 3.47 Set Real time Backup Directory

Section

4

4 Acquisition

Acquisition is the main logging or data acquisition subset of the Warrior system. It acquires data from the hardware I/O devices, stores the raw data in the Warrior database and provides all the normal well logging functionality. When necessary, it also automatically starts other Warrior programs to perform additional functions in an integrated manner. In the Warrior System group, choose the Acquisition icon. (Double-click the icon,). Note SDS sets up the software to display a Warrior System group on the desktop. However the program group is also available via the Start button.

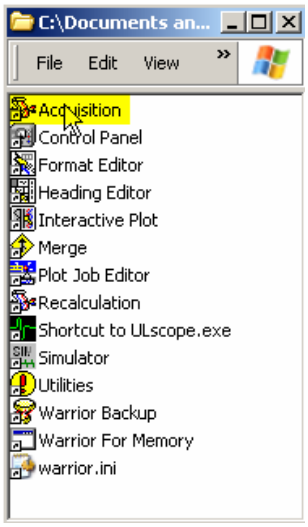


FIG: 4.1 Acquisition

Warning! Never switch off or disconnect a panel if Acquisition is running; always exit Acquisition first. Unpredictable results may occur if communication is lost with a panel during an Acquisition session.

Warrior is sensitive to USB devices being disconnected whilst it is running. USB devices can disconnect automatically when a computer goes into standby, so it is recommended that all standby/sleep/hibernate functions on the computer are disabled when using Warrior, not forgetting that closing the lid on laptop computers often puts them into standby as well.

4.1 Depth Control

The Warrior Logging System menu box will appear, along with the depth display. The depth box displays the current depth and the line speed and has a **Control** button that causes the Depth Control window to be displayed.

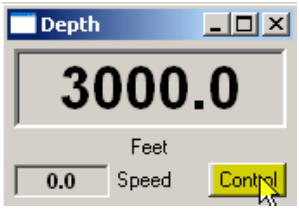


FIG: 4.2 Depth Display

Click on the **Control** button of the **Depth** window or hit Enter when the Depth window is active. The **Depth Control** window appears as shown in Fig: 4.2. Enter the current depth in the **New Depth** field and click on **Apply** (or hit **Enter**). To configure the Depth Control, click on the **Config** button to access the Parameters and Alarms menu Fig: 4.5. The **Depth Panel** setting should normally be left at **None**; it is only used when there is a stand-alone depth system.

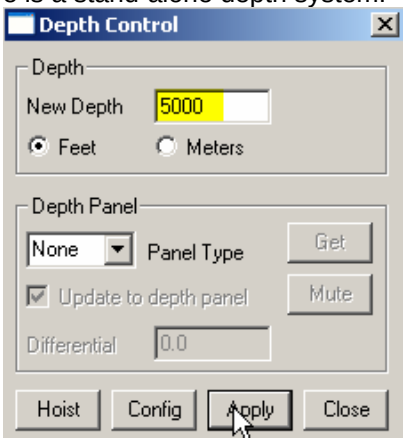


FIG: 4.3 Depth Control

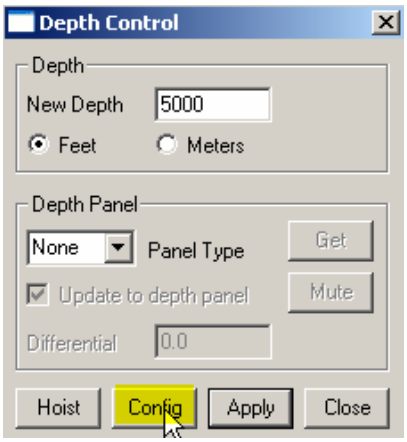


FIG: 4.4 Depth Control Configurations.

The Depth Configuration window enables selection of the depth source from an encoder input or a simulated depth input generated from within the software. The measuring wheel correction, the encoder characteristics, nominal wheel size, and encoder direction are entered from this dialog box. The simulated encoder speed and direction are adjusted using the slider bar and radio buttons.
Parameters in green Hi-Liter for the Scientific Data Systems Depth, Tension, and Line Speed panel (if it installed) may also be entered or read.
The depth control box may be displayed at any time by clicking the Control button of the depth display; however the New Depth, Correction, Encoder Resolution and the Wheel Size parameters may not be changed while logging.
The system maintains the encoder depth and the simulated depth separately, and keeps them updated. It is therefore possible to switch to simulated depth while the encoder is turning, perform some operation, and then return to the encoder depth, which will be updated and accurate. The Alarms set the values and tolerance to active the alarm, if the box is check. Reverse set the encoder direction (Up/Down) in the computer.

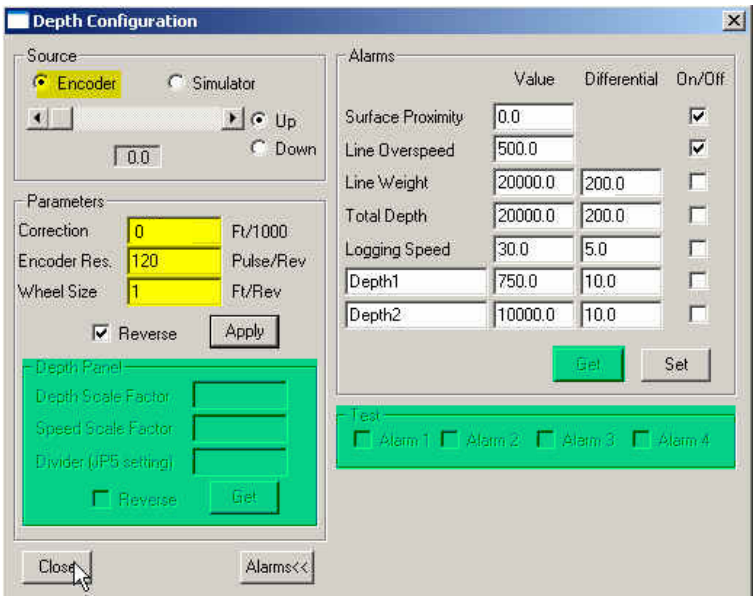


FIG: 4.5 Depth Configuration

Scientific Data Systems Depth, Tension, and Line Speed panel is connecting in the **USB** port select USB, if there is not panel available select **None** option.

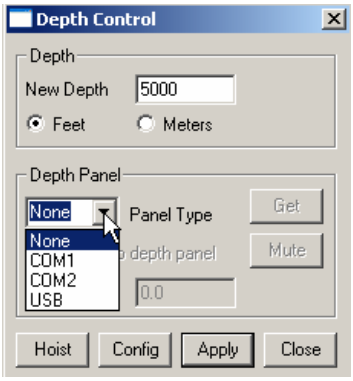


FIG: 4.6 Depth Panel Type

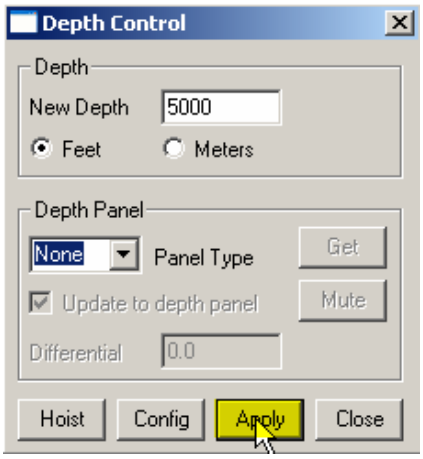


FIG: 4.7 Select Depth Panel.

Click on the Control button of the Depth window or hit Enter when the Depth window is active. The Depth Control window appears as shown below. Enter the current depth in the New Depth field, and clicks on **Apply** (or hit Enter).

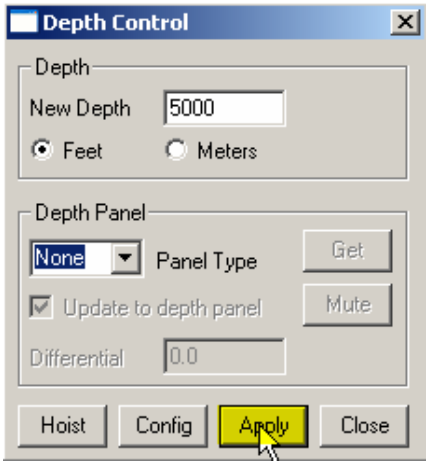


FIG: 4.8 Apply to Set Depth

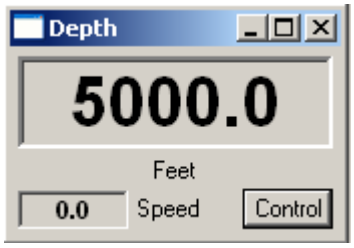


FIG: 4.9 Set Depth

4.2 File

The following options can be selected in File:
Select Dataset, Load variables, About, Exit, Close All.

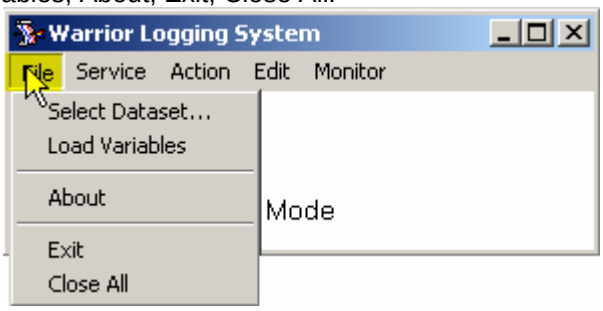


FIG: 4.10 File Options.

4.2.1 Select Dataset

The Warrior well log database can (optionally) contain data from many wells, and within each well, data from many log passes. Each log pass is stored in a dataset. The dataset contains not only log data, but also other information about the logs, e.g. calibration and tool data.

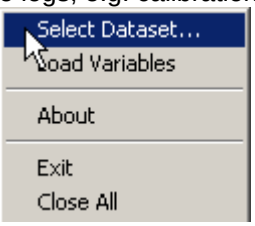


FIG: 4.11 Select Dataset.

The system requires a DOS filename to be defined for the database file within which the data is to be stored. The structure of the Warrior log database allows datasets to be defined by field, well, run and pass. The user may optionally choose to insert in the various fields of the **Select Dataset** window, abbreviations of the actual field and well names. The run number and pass may also be entered, or they may be used to identify some other features of the dataset.
As an example, when running production logging, multiple passes are normally made, and can be difficult to identify later, if the dataset definition is left with the default entries. Another approach is to use the run field to identify the tool being run, e.g. field/well/temperature/pass1. The pass number will automatically increment every time a log is started.
If desired, modify the remaining fields to reflect the actual well and log information.
Click on OK or hit ENTER.

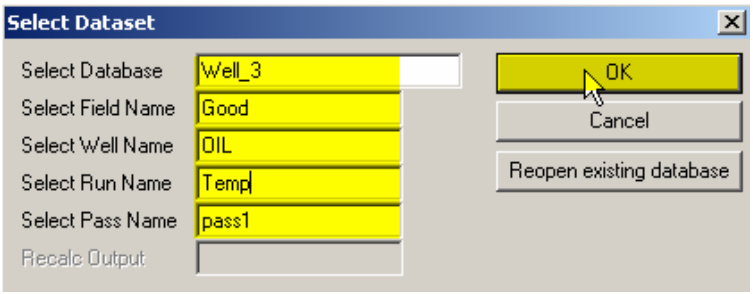


FIG: 4.12 Select Dataset

Enter a compliant file name in the Select Database field

If desired, modify the remaining fields to reflect the actual well and log information.
Click on **OK** or hit **ENTER**.

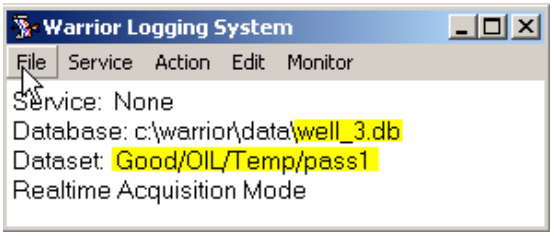


FIG: 4.13 Dataset Values

Warning!

The file names may contain only the following characters:
Numbers (0,1-9)
Letters (A-Z, a-z)
Blank (Theoretically you can have spaces)
ASCII characters greater than 127
Special characters: **$ % ' - _ @ ~ ` ! ( ) ^ # & + , ; = [ ]**
Lengths of the file names are limited to 255 characters (260 for full paths).

The user may choose to store all data from a particular field in one file, or only the data from one log pass, or any intermediate level depending on the requirements. The usual procedure is to store all the data from one job in one file. In this way it is simple to backup the data to tape before leaving the wellsite.
Data may be merged into a single log file, or split into several files using the Merge program, to be described elsewhere.

4.2.2 Load variables

This option allows you to load Zoned Variables from previous database passes. This is particularly useful when repeating runs, but creating a new database every time. Load Variables the other Dataset, enabling depth dependent parameters associated with the selected service to be zoned and values to be set.

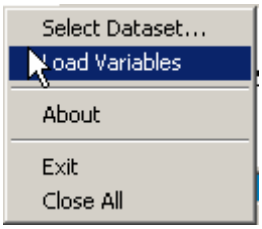


FIG: 4.14 Load Variables

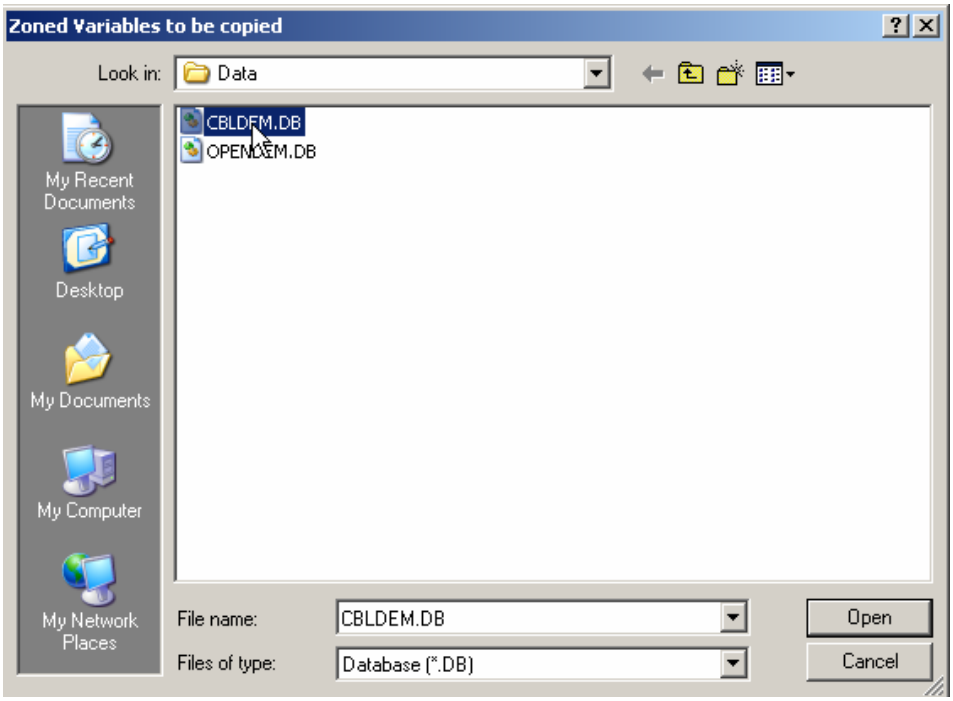


FIG: 4.15 Load Dataset Values

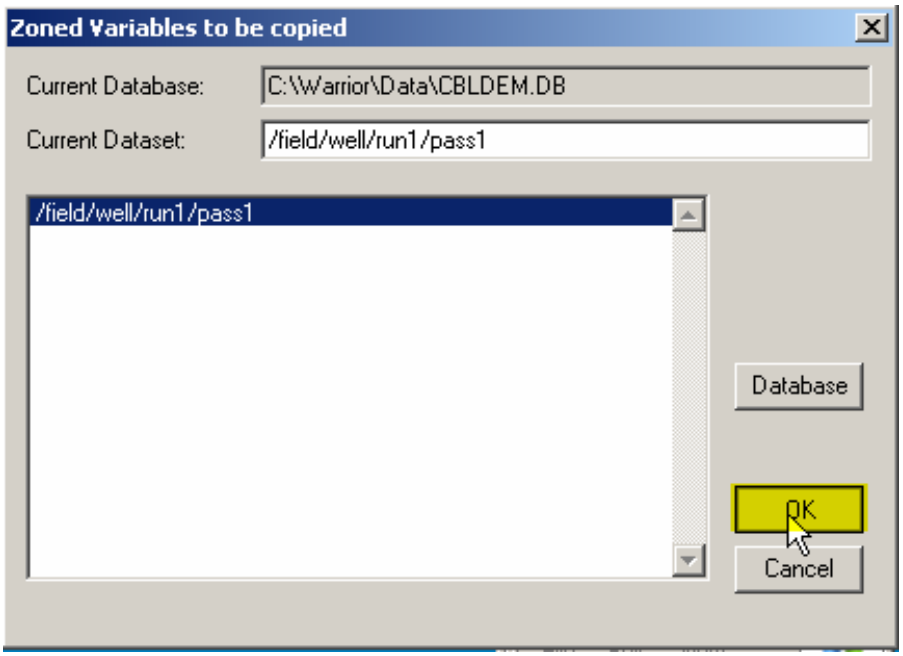


FIG: 4.16 Dataset Values run1/pass1

4.2.3 About

Shows the Software version installed in your computer

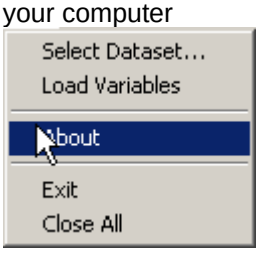


FIG: 4.17 Select About

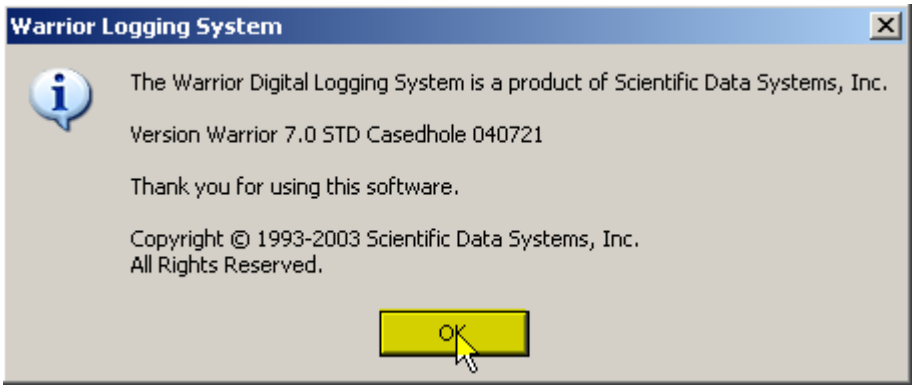


FIG: 4.13 Show the Version Warrior Software

4.2.4 Exit

Closes the program in the standard Windows manner. Exit the acquisition window.

4.2.5 Close All

Closes all windows that have been opened in a Warrior Acquisition session.

VIDEO: 4.1 File

4.3 Service

In the Warrior acquisition window click on **Service** and select the desired service from the drop down box. The services can be customized using '**Edit Logging Service Details**', in Warrior Utilities.
None is the service that is loaded by default when the Acquisition module starts and must always be present. As delivered, it contains no tools (except the tool STD that is a dummy tool that must be included in every service). It will display depth, and you can monitor line tension and speed.

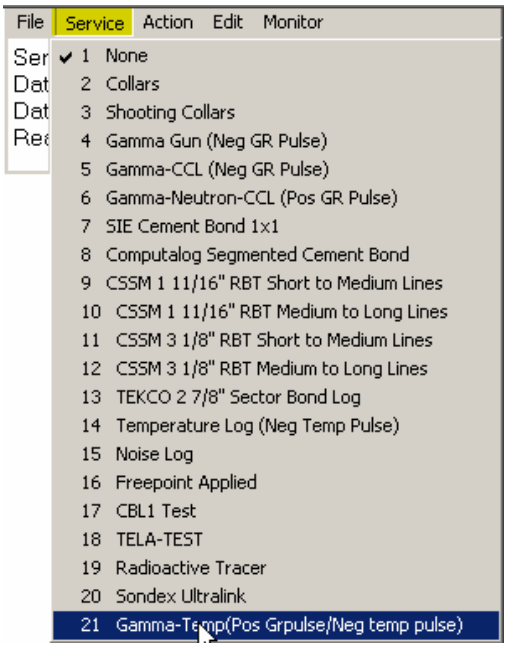


FIG: 4.14 Select Service

The tool string editor will appear. The correct serial number and placement for each tool should be verified. Length, offsets will be calculated and calibrations for the selected tool serial numbers will be loaded. Select **Properties** to go **Tools Editor.**

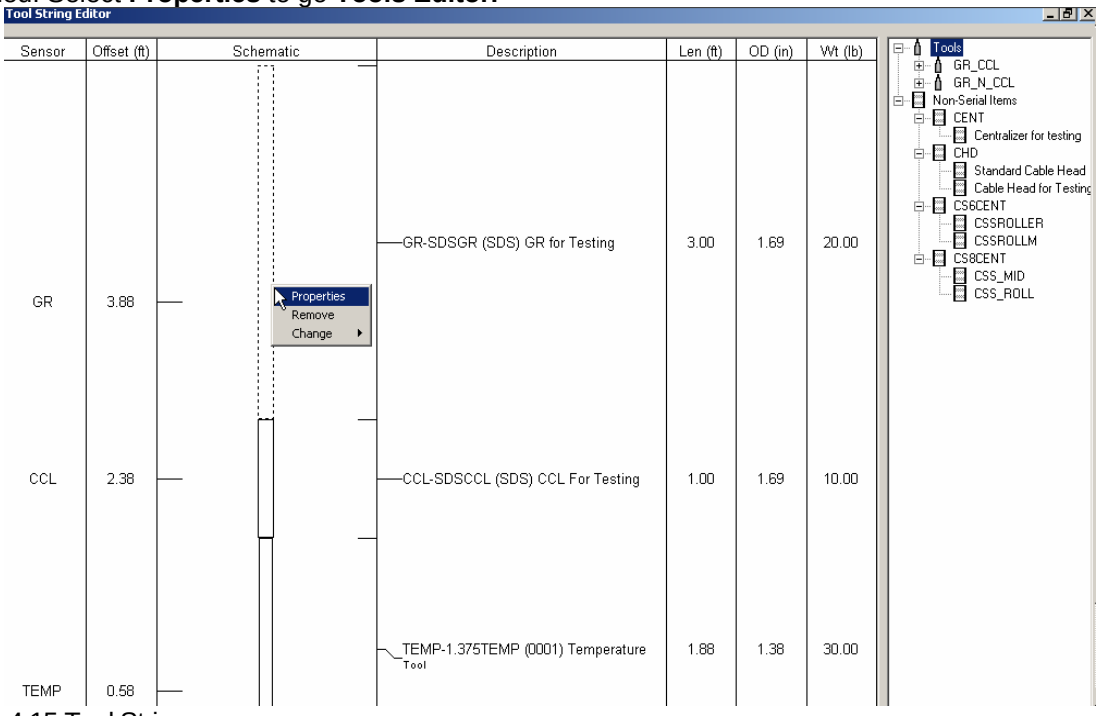


FIG: 4.15 Tool String

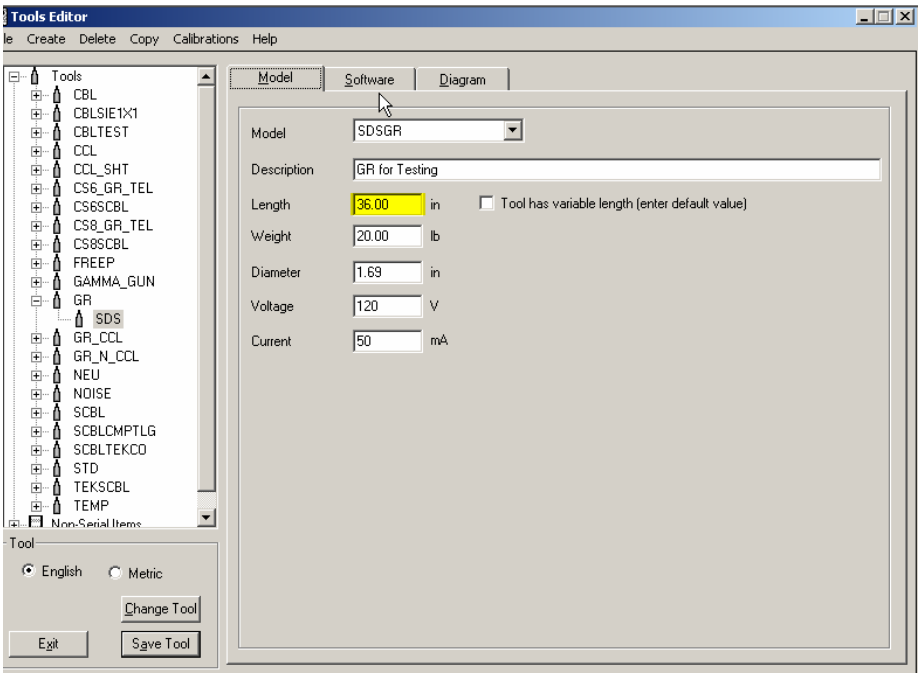


FIG: 4.16 Tools Editor

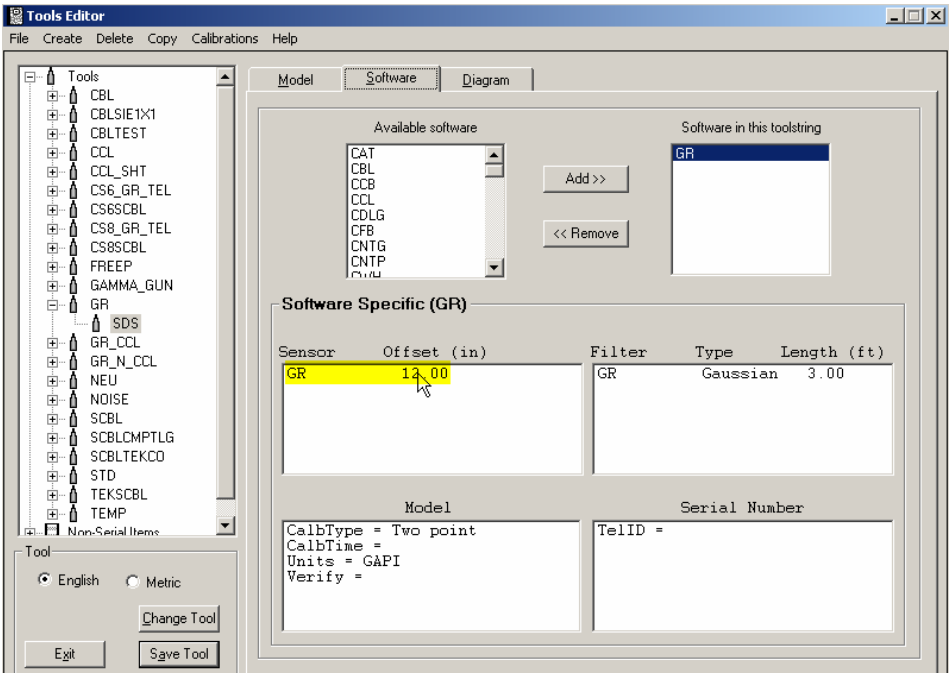


FIG: 4.17 GR Sensor Offset

In the Fig: 4-18, 4-19,4-20, 4-21,and 4-22 show the way to take the tool measure for Length and Offsets

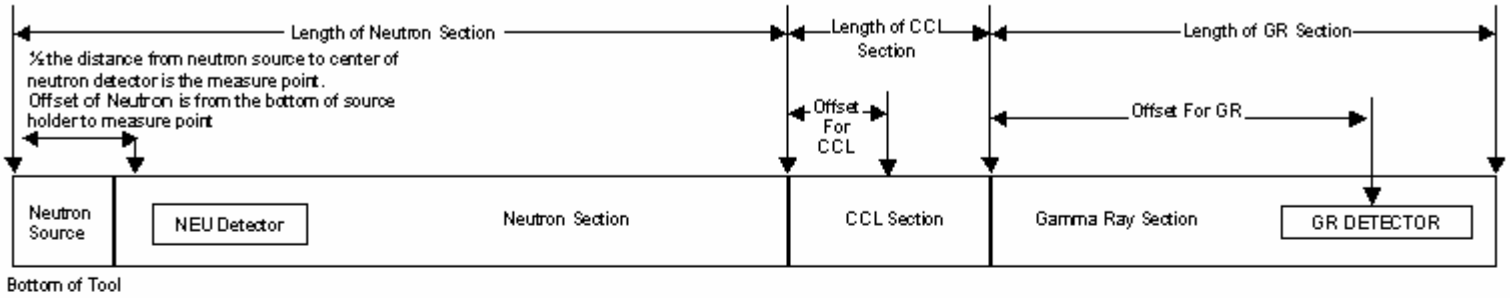
Model					
Serial Number					
Diameter of Tool					
Length of CCL Section					
Offset For CCL					

FIG: 4.18 CCL Tool Length and Offset

Model					
Serial Number					
Diameter of Tool					
Length of GR Section					
Offset For GR					
Length of CCL Section					
Offset For CCL					

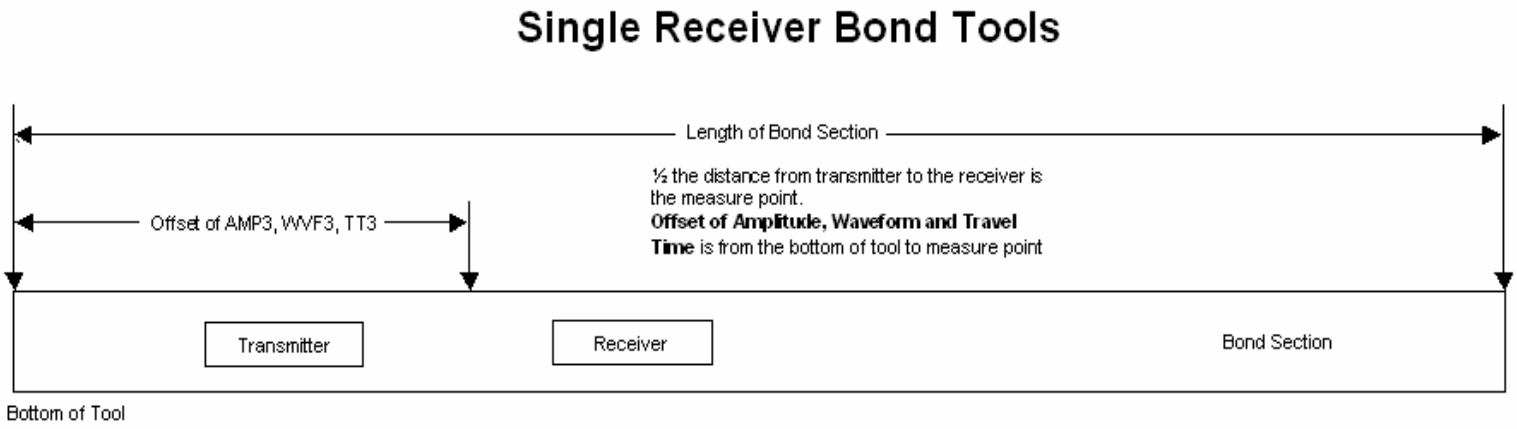
FIG: 4.19 Gamma Ray /CCL Tool Length and Offset

Gamma Ray Neutron CCL Tools



Model					
Serial Number					
Diameter of Tool					
Length of Neutron Section					
Offset For Neutron					
Length of CCL Section					
Offset For CCL					
Length of GR Section					
Offset For GR					

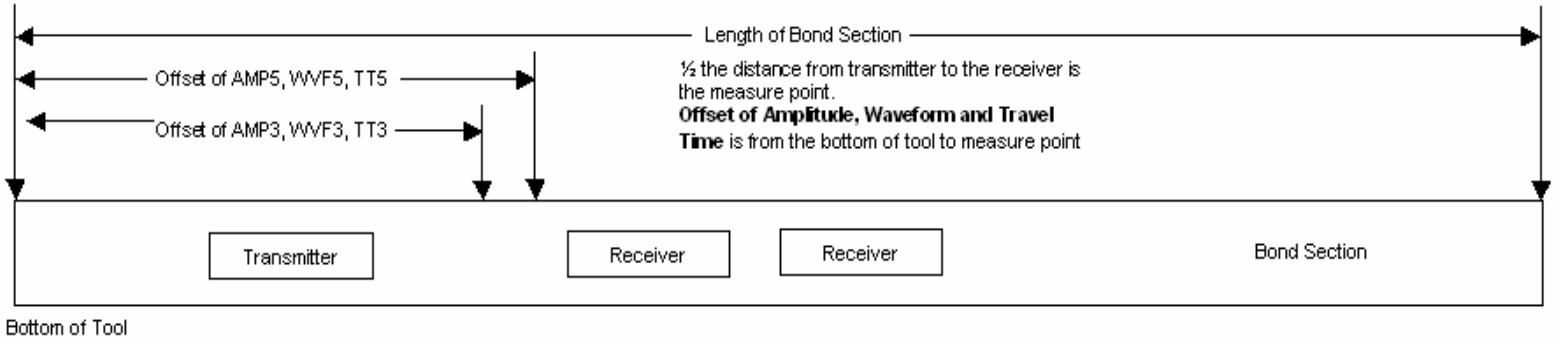
FIG: 4.20 Gamma Ray /Neutron/CCL Tool Length and Offset



Model					
Serial Number					
Diameter of Tool					
Length of Bond Section					
Offset For AMP3, WVF3, TT3					

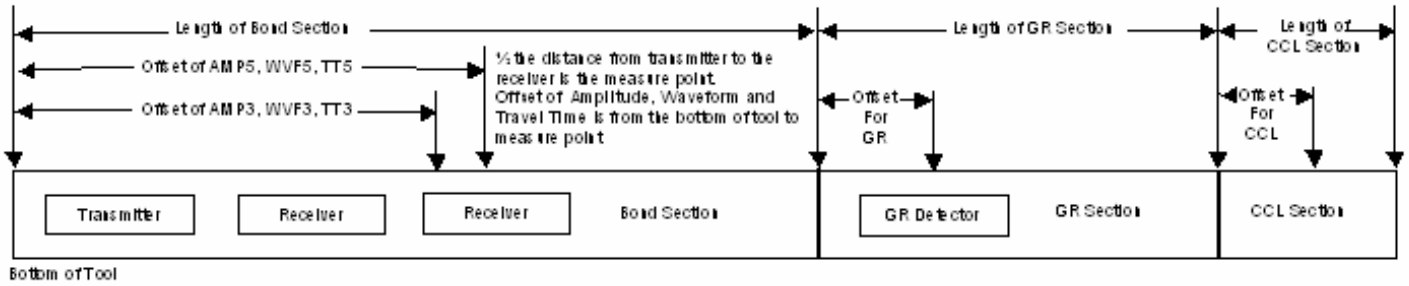
FIG: 4.21 Single Receiver Bond Tool Length and Offset

Dual Receiver Bond Tools



Model					
Serial Number					
Diameter of Tool					
Length of Bond Section					
Offset For AMP3, WVF3, TT3					
Offset For AMP5, WVF5, TT5					

FIG: 4.22 Dual Receiver Bond Tool Length and Offset



Model					
Serial Number					
Diameter of Tool					
Length of Bond Section					
Offset For AMP3, WVF3, TT3					
Offset For AMP5, WVF5, TT5					
Length of GR Section					
Offset For GR					
Length of CCL Section					
Offset For CCL					

FIG: 4.23 Dual Receiver Bond/Gamma Ray/CCL Tool Length and Offset

After the service has been loaded the selected service will be listed on the service line in the acquisition window.

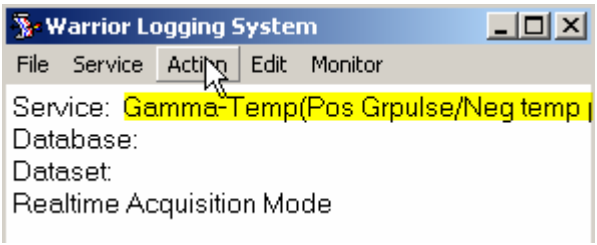


FIG: 4.24 Warrior Logging System

Set the service
Select **Action**

4.4 Action

FIG: 4.25 Power Control

4.4.1 Power Control

Select Power Control from the **Action** menu. The Power Control window appears as shown below.
Select the **Enable** box.
Note: Tool voltage a current must be calibrated.

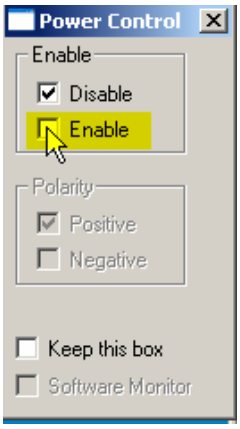
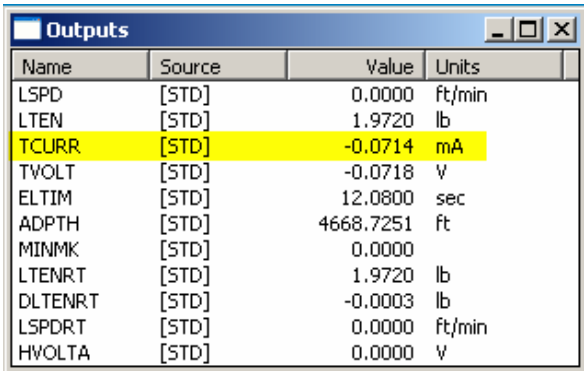


FIG: 4.26 Power Control



Name	Source	Value	Units
LSPD	[STD]	0.0000	ft/min
LTEN	[STD]	1.9720	lb
TCURR	[STD]	-0.0714	mA
TVOLT	[STD]	-0.0718	V
ELTIM	[STD]	12.0800	sec
ADPTH	[STD]	4668.7251	ft
MINMK	[STD]	0.0000	
LTENRT	[STD]	1.9720	lb
DLTENRT	[STD]	-0.0003	lb
LSPDRT	[STD]	0.0000	ft/min
HVOLTA	[STD]	0.0000	V

FIG: 4.27 TCURR Outputs

When the Tool Current (TCURR) is less of 10 mA for a Time period more than 10 seconds, the tool power supply relay is set to the power **disabled** position.
The Tool Current point value (10mA) is set in warrior.ini

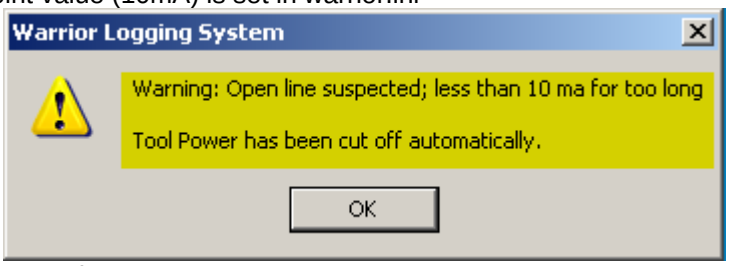


FIG: 4.28 Open Line Warning

Boolean switches (which can be entered as 'true', 'yes' or '1', or, 'false', 'no' or '0'):

NoMonitor= True to completely disable power monitoring)
External= rue will allow monitoring (if TVOLT and/or TCURR are measured), but only pop-up message; no cutoff

Numeric entries:

OverCurrent= Maximum allowable TCURR milliamps, 0 = disable current monitoring.
OverVoltage= Maximum allowable TVOLT volts, 0 = disable voltage monitoring.)
OverDissipation= Maximum allowable TVOLT/TCURR watts, 0 = disable dissipation monitoring.)
ShortVoltage= Minimum TVOLT volts AND

ShortCurrent= Maximum TCURR milliamps for short-circuit detection, either 0 = disable short monitoring)
OpenCurrent= Minimum TCURR milliamps AND
OpenTime= Maximum time interval for open-line detection, either 0 = disable open monitoring)
N.B if supply in NOT external, missing entries will be defaulted to 10 milliamp and/or 15 seconds.

Text entries:

ActionOnTrip= 'Cut' anywhere in the entry causes supply to be turned off, if possible; 'warn' anywhere will cause a message box to pop up.)

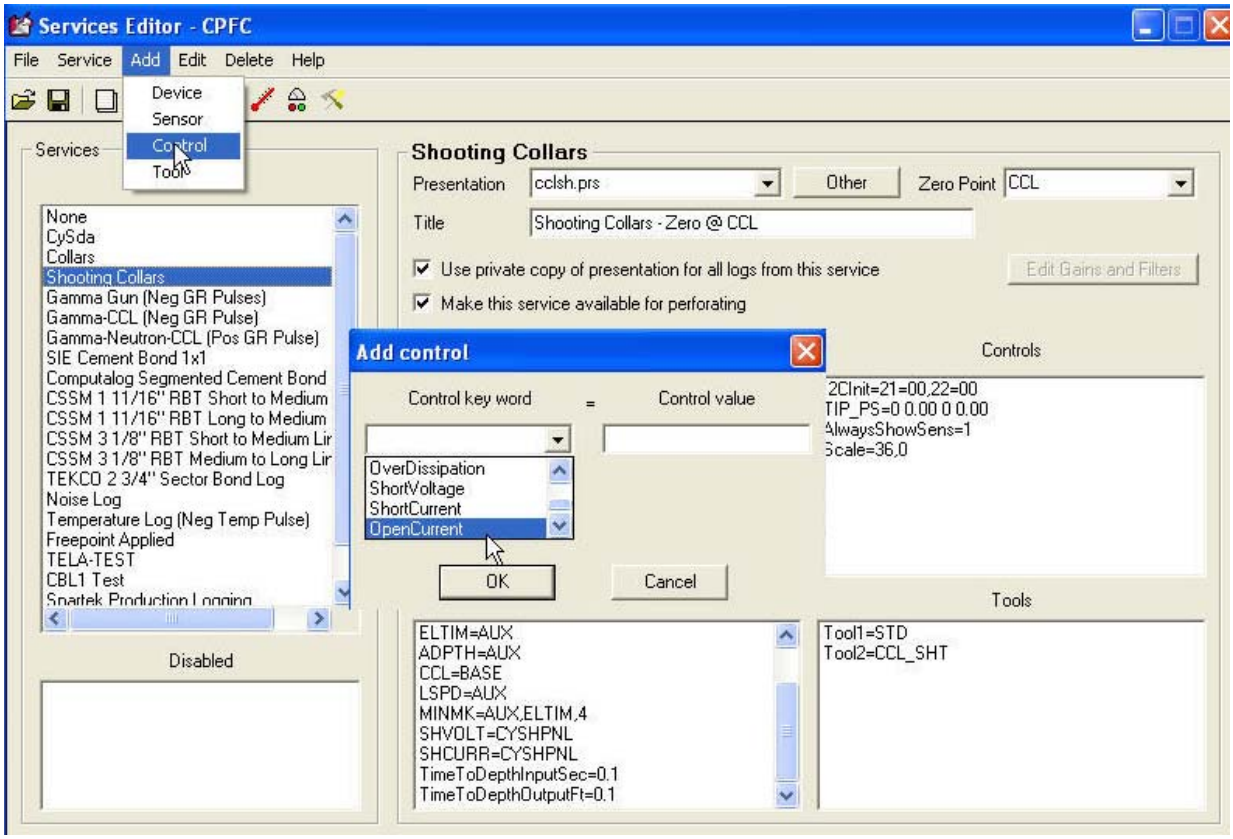


FIG: 4.29 Add Controls

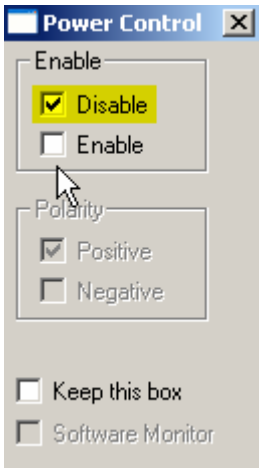


FIG: 4.30 Power Control

When the Warrior system is invoked or the service is changed, the tool power supply relay is set to the power **disabled** position. Clicking the **Enable** button sets the relay to the enabled position and allows tool power to be applied to the wireline. Clicking **Disable** disconnects the power supply from the line and connects the line to ground.
The user may choose to have the Power Control box disappear whenever an action is taken by deselecting **Keep this box**. Otherwise the box will remain until closed by the user in the normal manner.
In order to Enable the software Power Control go to Services Editor, select the service, ADD control, select SoftPowerControl , and Save .

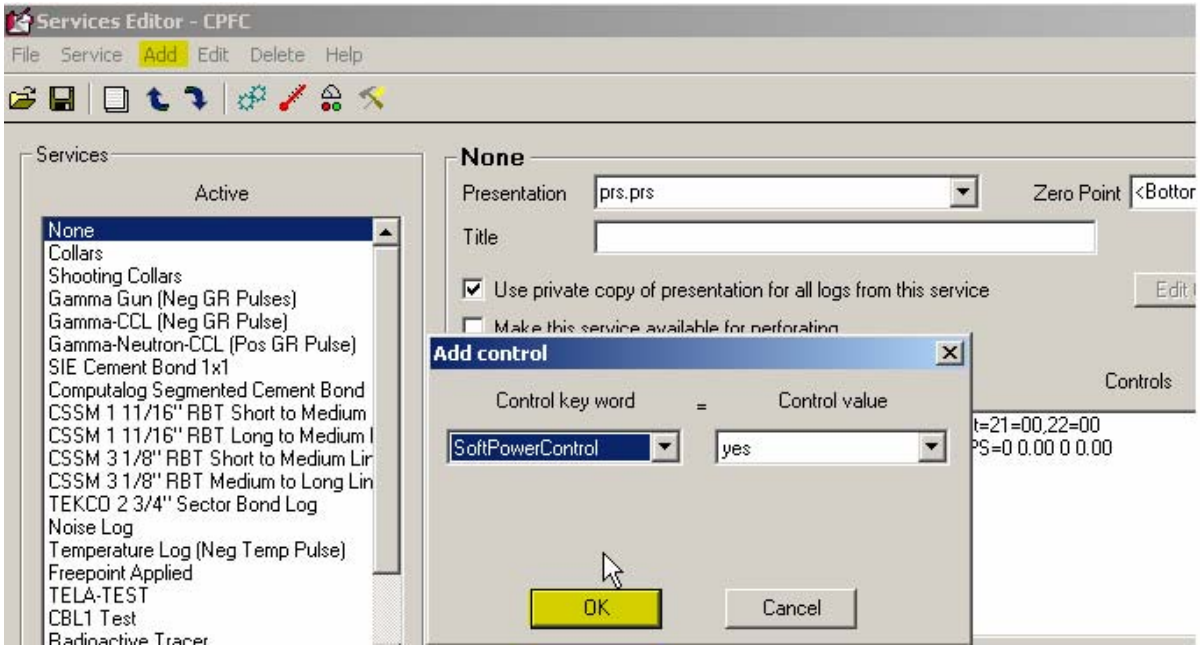


FIG: 4.31 Services Editor

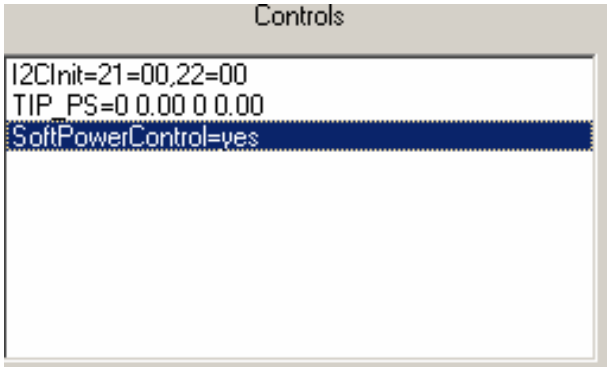


FIG: 4.32 Controls

The Acquisition software module monitors the output current and voltage, and the power dissipation within the tool power supply. It checks for over voltage, over current, excessive power dissipation and short circuit conditions. If any fault condition is detected the power supply will be disconnected from the line and a warning message displayed.

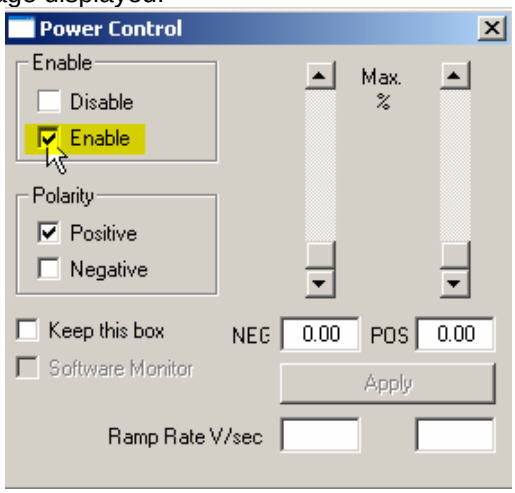


FIG: 4.33 Line Enable

The **Polarity** section of the window controls the polarity of the line voltage with respect to ground. The default is **Positive**. Clicking the appropriate button, causing the polarity relay to switch, may change the polarity. In order to switch the polarity of the power supply from the Power Control window the Interface Panel Polarity Switch must be in the **Auto** position.
The line power can also be controlled from Power Control window. Entering a percentage of the line power into the relevant textbox and clicking on the **Apply** button can adjust the level.
You can also use the scroll bars as an alternative.
For a number of tools, the line power needs to be ramped up gradually before reaching its maximum. You can enter a **Ramp Rate** in Volts per second in the textbox, provided, to protect these tools.
Turn On the switch Tool Power and adjust the tool voltage according to the Tool specification.
If the base line is clean adjust the threshold at 50% of the signal.

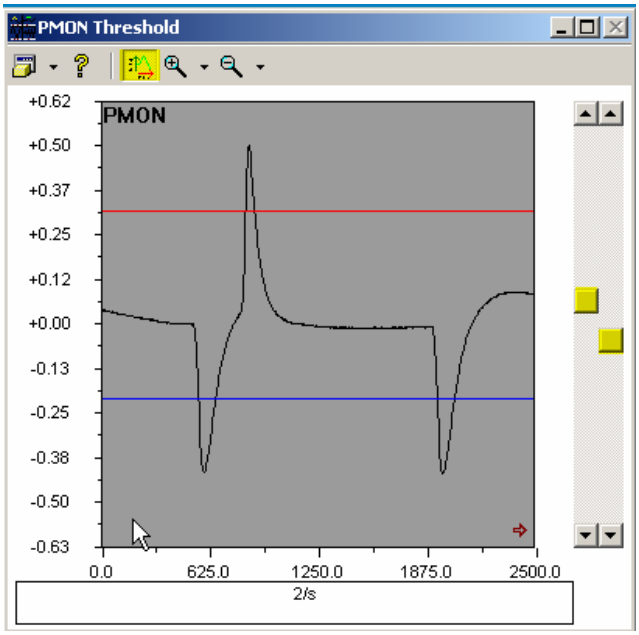


FIG: 4.34 PMON Threshold

Adjust the amplitude of the pulse signal with the Sync Gain Slide bar, and adjust the CCL signal with the CCL Gain Slide bar.

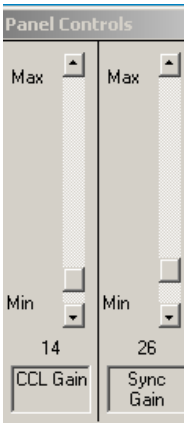


FIG: 4.35 Slide bars Control

4.4.2 Caliper Control

This function is for Open Hole tools to Open and Close the Caliper.

4.4.3 Relay Control

The relay control is for opened Hole tools to switch the down tool from de log mode to Calibration Mode or reference Mode.

4.4.4 Calibrate

Invokes calibration procedures for particular services.

Note that in order to record a post survey calibration a log pass must be generated after performing the calibration. In order to include the post survey calibration in the Plot Job this log pass must be selected when selecting the post survey calibration.

4.4.5 Verify

Invokes verification procedures for various services.
Note that in order to record post survey verification a log pass must be generated after performing the verification. In order to include the post survey verification in the Plot Job this log pass must be selected when selecting the post survey verification.

4.4.6 Plot Cal Report

Allow you to print out all the calibrations information for all the tools in the current string.
Print out the calibration report at the end of the Log.

4.4.7 Record Up

The plot may be paused by using the **Pause** button and terminated by reselecting **Unpause**. The plot may be paused at any time and the scroll bar, used to move back through the log to any zone of interest. When moving the scroll bar, the actual log depth, corresponding to the scroll bar position, is indicated in a box in the centre of the log plot window. A popup window opens by right clicking on the plot, displaying all the curve's values (Log readings) at the mouse position.

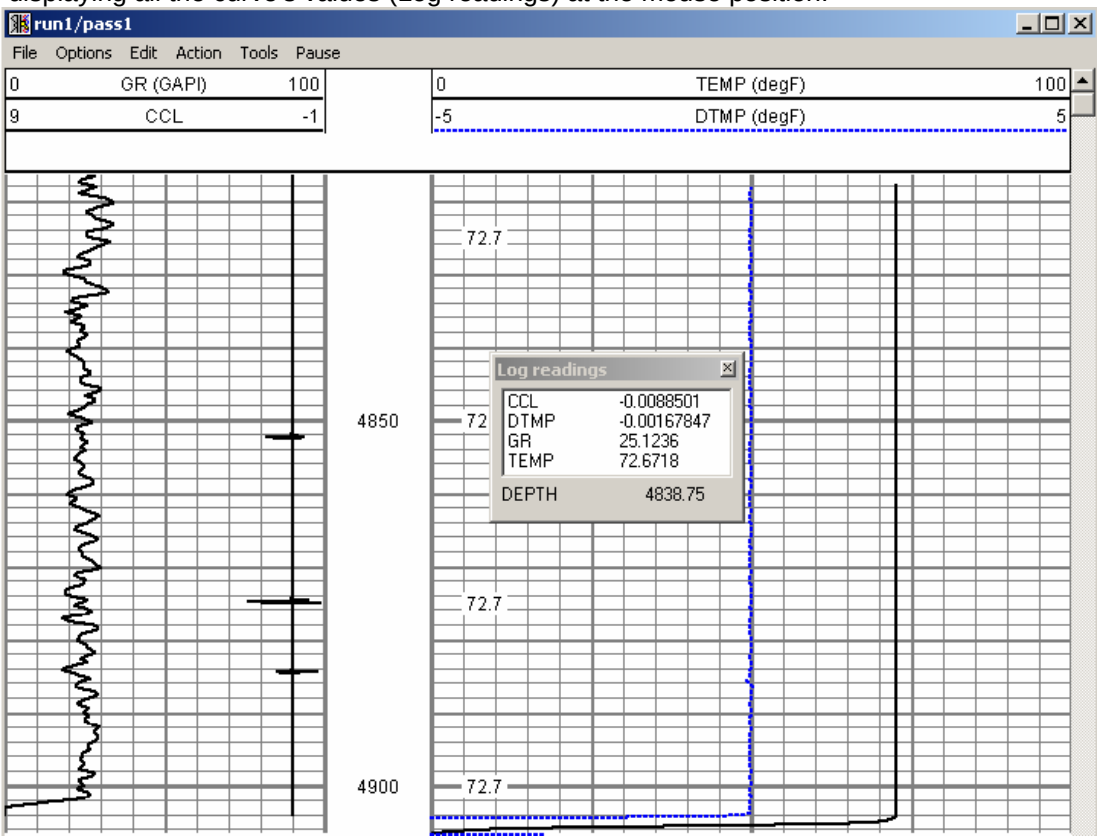


FIG: 4.36 Record Up GR/CCL/TEMP

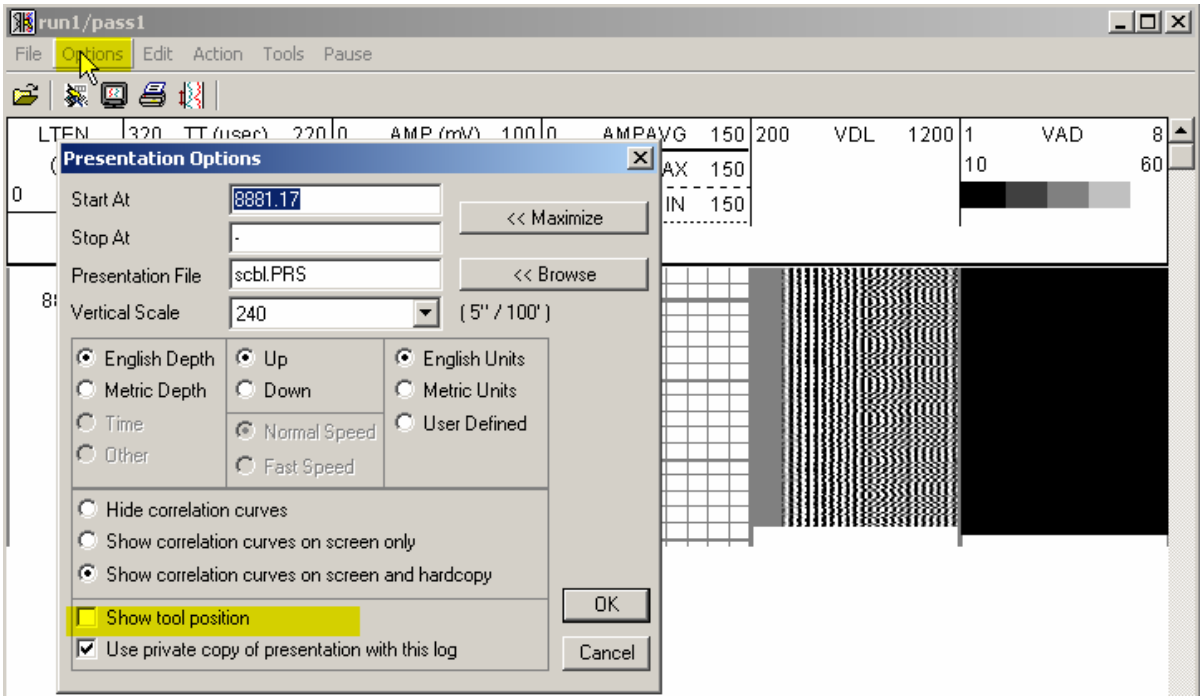


FIG: 4.37 Options

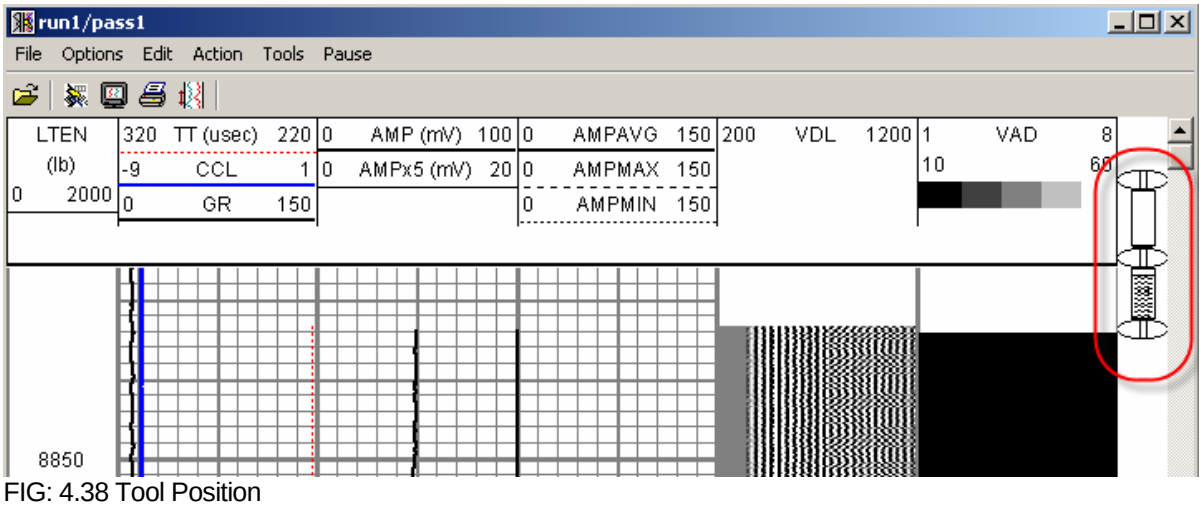


FIG: 4.38 Tool Position

This option show the tool position

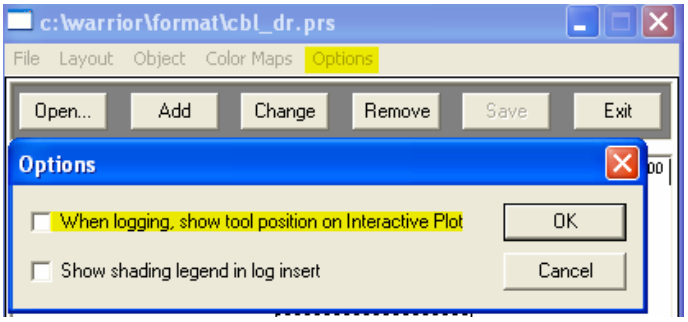


FIG: 4.39 Tool Position ON/OFF

4.4.8 Record Down
Starts logging down.

4.4.9 Record on Time
Sets record on time reference mode. You will be prompted for the sampling rate in samples per second for fast sampling; or seconds per sample for slow sampling.

4.4.10 Replay
Replays data from current database.

4.4.11 Independent Replay
Replays data from any database.

4.4.12 Depth Shift
Makes a linear shift to the depth reference on a data file.
This feature is intended to provide a rapid tie-in capability by applying a linear depth shift to a dataset. Once a section of log has been made and is displayed on the screen, select **Depth Shift** from the Action menu. The window shown in Fig:4.30 below appears. Or **Apply Linear Depth Shift** function is also available from the **Utilities** program in the Warrior shortcut folder.

FIG: 4.40 Depth Shift

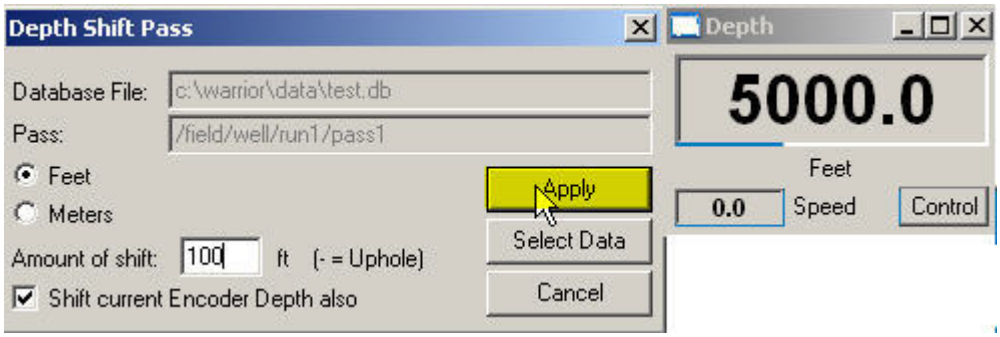


FIG: 4.41 Down Hole Depth Shift 100 ft.

The database and pass are defaulted to those of the last logged section. The **Feet** or **Meters** selection is defaulted to that set in the **Control Panel.**
Enter the required depth shift for the file and click **Apply**. Note that a positive number, entered here, **increases** the overall depth of the file. The screen plot of the file is now automatically redrawn, reflecting the applied depth shift

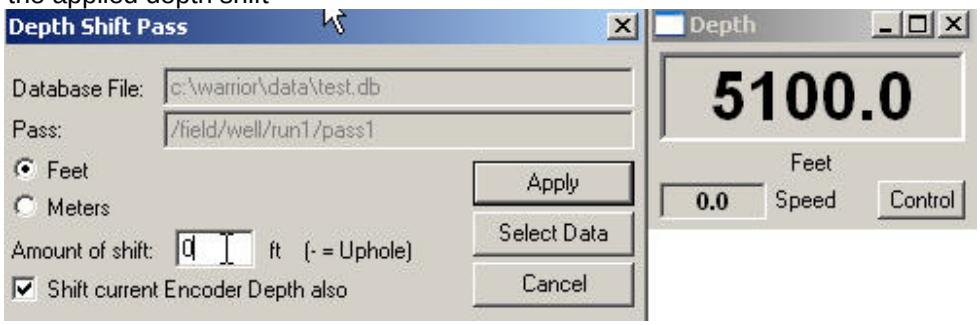


FIG: 4.42 Set Depth Shift 100 ft.

Add 100 Ft.

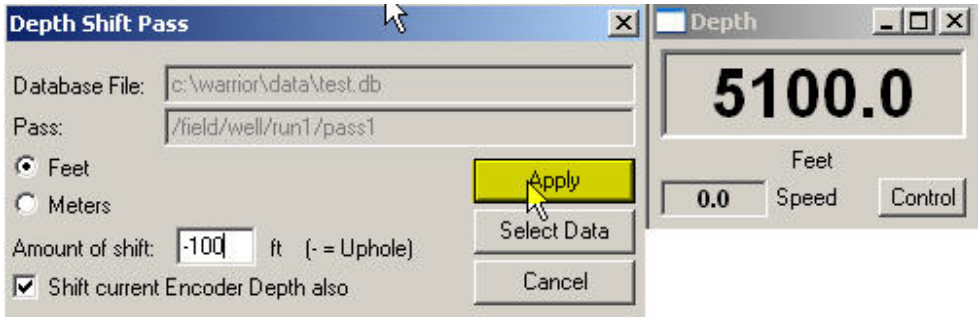


FIG: 4.43 Up Hole Depth Shift -100 ft

Subtract 100 Ft.

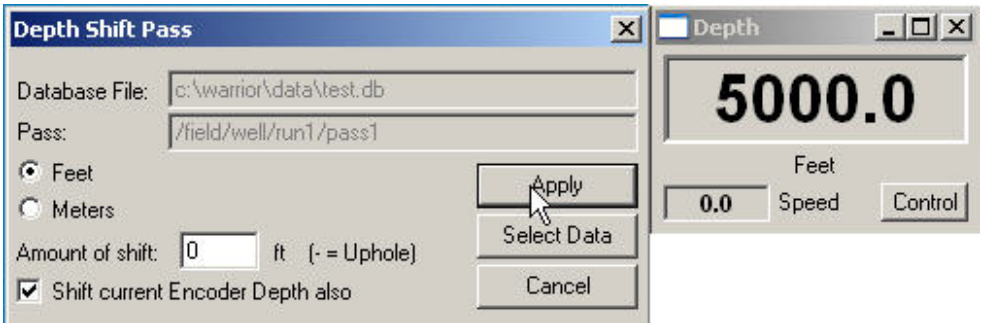


FIG: 4.44 Set Depth Shift -100 ft

The current encoder depth will be automatically updated when the **Shift current Encoder Depth also** box is selected. This is the default when the depth shift is run from Acquisition.
Note also that the shift may be made whilst logging; and that the encoder depth and log display will update accordingly. This facility may be used to apply a linear depth shift to log data, other than the current database. This can be achieved by using the **Select Data** button to bring up a file selection box. Ensure that the **Shift current Encoder Depth also** box is not selected, unless it is required to update the system depth.

VIDEO: 4.2 Depth Shift

4.4.13 Preview Up

Allows viewing of the log on screen (Interactive Plot) or hardcopy without permanently recording data to disk.

4.4.14 Preview Down

Allows viewing of the log on screen (Interactive Plot) or hardcopy without permanently recording data to disk.

4.4.15 Preview on Time

Allows viewing of the log on screen (Interactive Plot) or hardcopy without permanently recording data to disk.

In Preview mode, data is actually being recorded in a special database called Preview.db. When the last program attached to Preview.db is closed this database is automatically deleted.
There is no way to recover Preview.db once it has deleted.

VIDEO: 4.3 Log Up GR/CCL/TEMP

4.5 Edit

4.5.1 Tool String

The tool string editor will appear. The correct serial number and placement for each tool should be verified. Select save, depth offsets will be calculated and calibrations for the selected tool serial numbers will be loaded.

Allows a tool string to be built from within the constraints of the selected service. Tools of the correct model may be selected by serial number and placed in the required physical position in the tool string. A tool string diagram is presented and the screen and may also be included in the hardcopy output by including in the plot job. Once the tool string has been assembled, the sensor offsets are automatically calculated using information stored in a tools database.

Note that a service will include one or more tools. The tools, which are included in a service, are defined in the services.ini file. Only those tools defined in the services.ini file may be entered into the tool string with the tool String Editor.

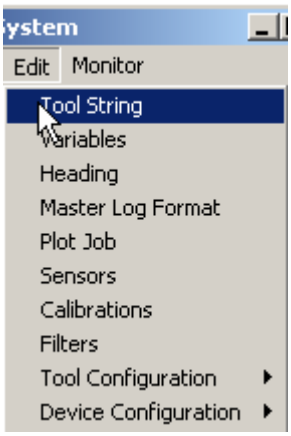


FIG: 4.45 Select Tool String

Select the required service and select **Tool String** from the **Edit** menu. The Tool String Editor will appear with the last saved tool string configuration.

4.5.1.1 Remove Tools in the string

To remove a tool from the string Mouse Right click on the tool section and select **Remove**.

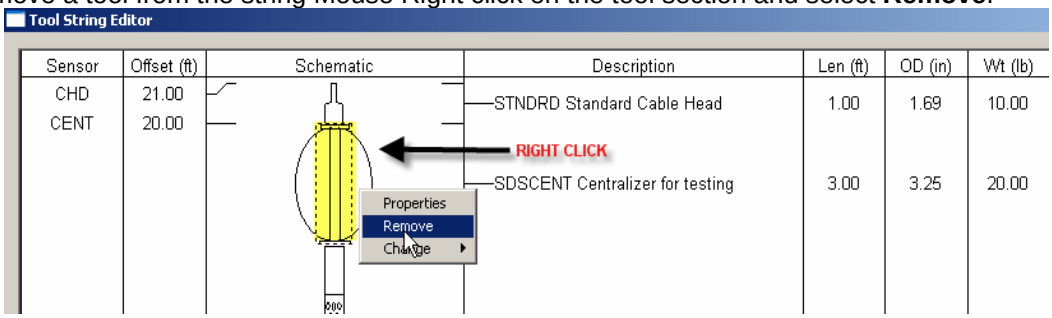


FIG: 4.46 Remove Tool

Other way is with Remove button and select the tool(s) to be removed using the **>>>** button(s) at the left of the tool string diagram. Note that, in the diagram below, the **>>>** buttons are now positioned at the center point of tools rather than at tool joints as in the above diagram.

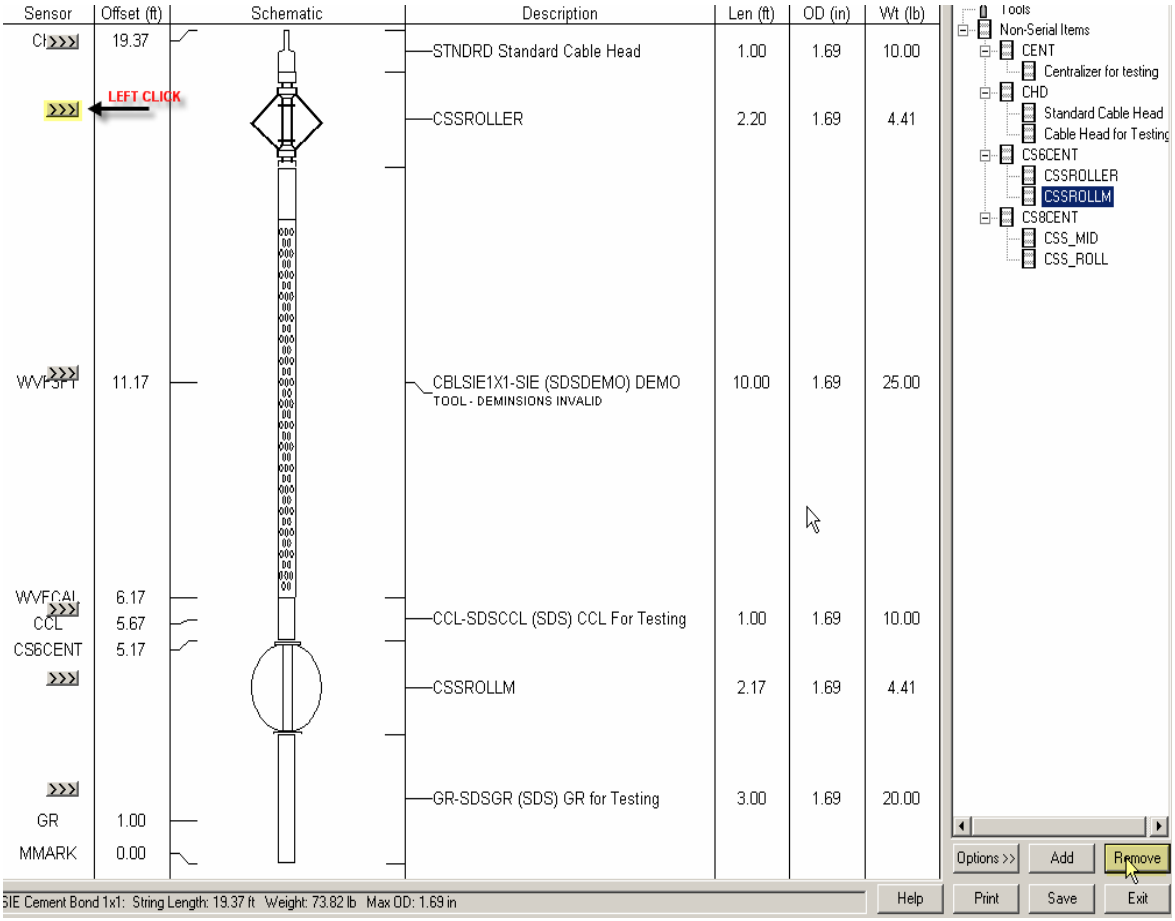


FIG: 4.47 Remove Tool

4.5.1.2 Add Tools in the string

To add tools to the string, click on the tool to be added and drag it into position in the tool string. A line on the drawing will indicate where the tool will be inserted. You can also click on any tool and drag to a new position in the string. To edit the properties of the tool, right click on the tool and select **Properties** to bring up the tool editor for that tool.
Select the tool drag and drop in the tool string.

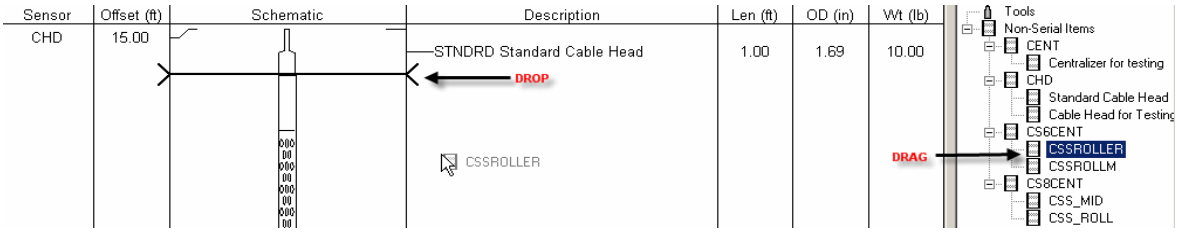


FIG: 4.48 Add Tool

Other option to Add is select the too with the mouse Left click, then Mouse Left Click over **Add** Button Once a tool has been selected the point at which it is to be inserted in the tool string is defined using the **>>>** buttons which appear to the left of the tool diagram.

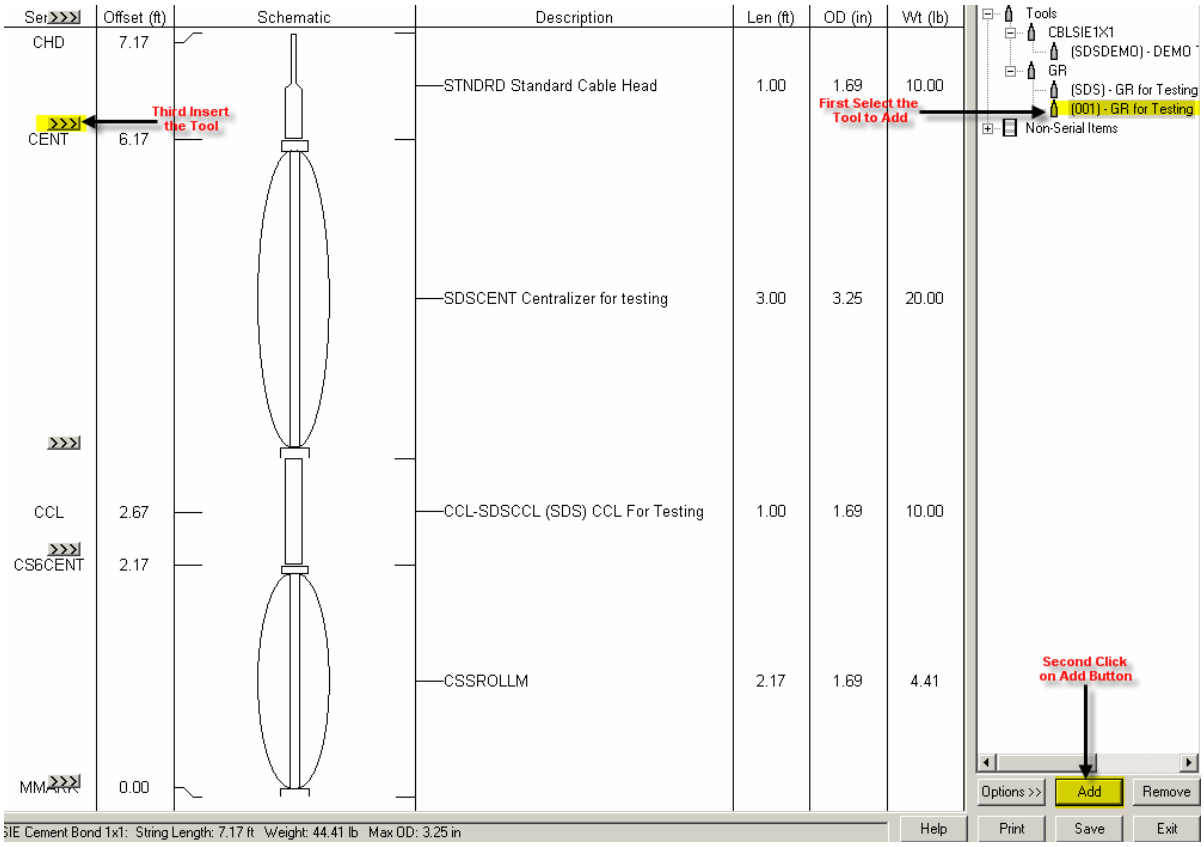


FIG: 4.49 Add Tool

4.5.1.3 Change Tool

To change to another tool of the same type, right click on the tool and select **Change** to see a list of the serial numbers of available tools that can replace the one in the string.

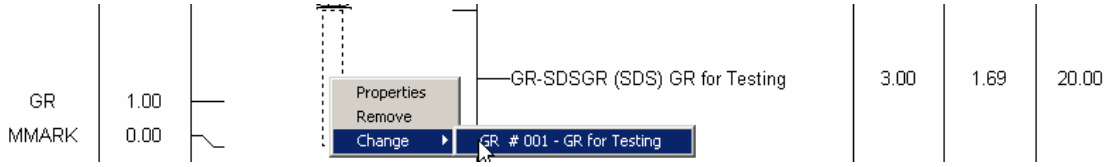


FIG: 4.50 Change Tool

4.5.1.4 Tool Properties

Mouse Right Click over the tool and select Properties

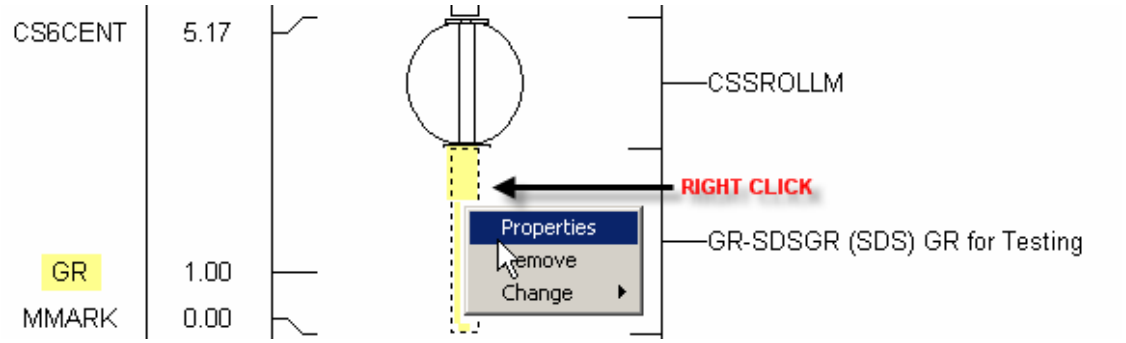


FIG: 4.51 Tool Properties

When editing has been completed, the tool string information is saved using the **Save** button. At this point, the service will be reloaded as the current status; and other parameters of the tool string may have changed.
Measure the tool from the Bottom to the Top and type the value

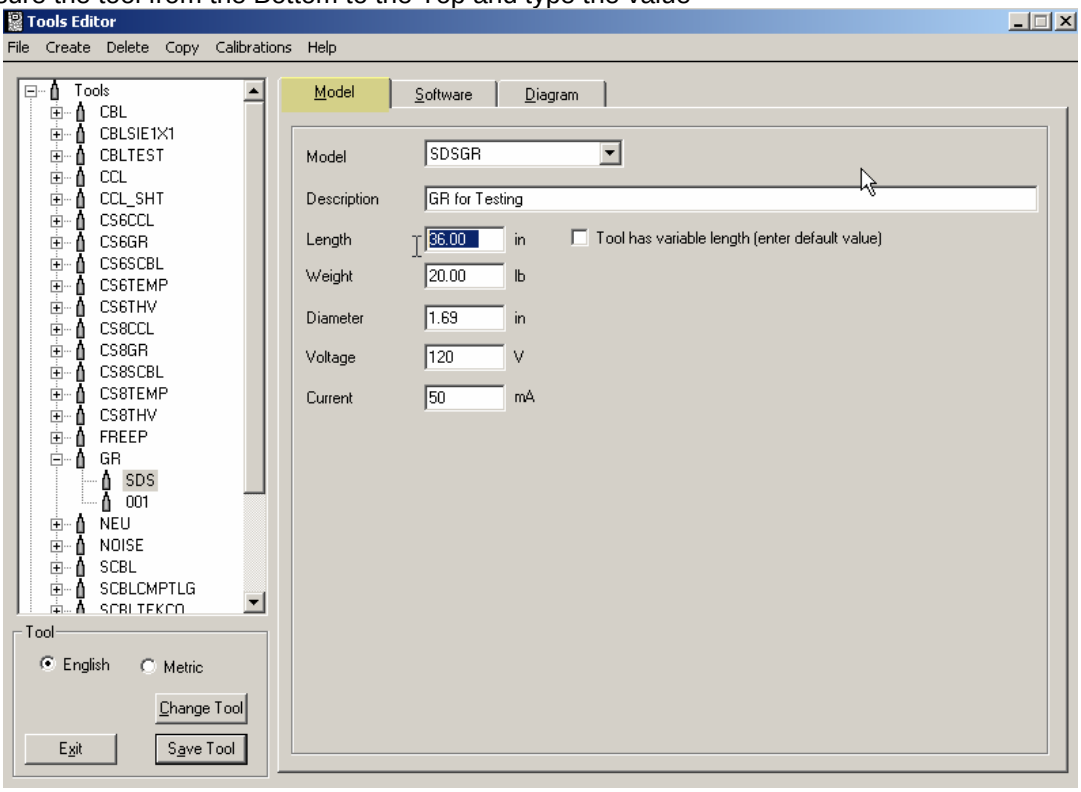


FIG: 4.52 Tool Model Properties

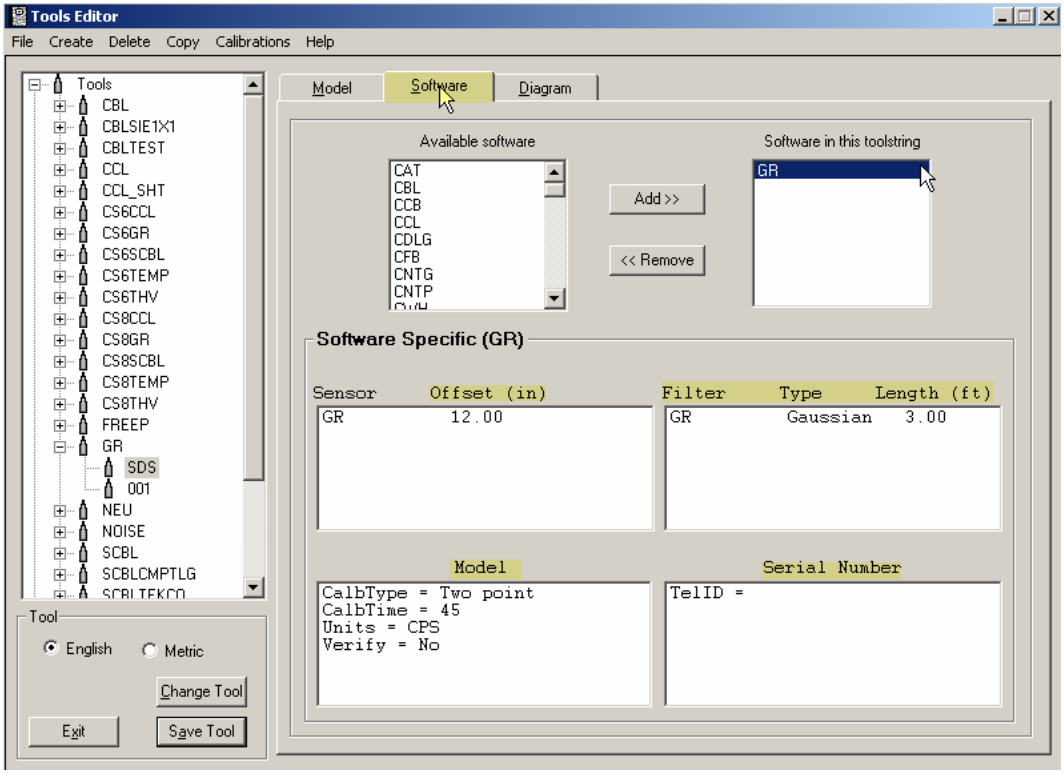


FIG: 4.53 Tool Software Properties

Measure the distance from the bottom of the Tool to the sensor and type the value in inches.

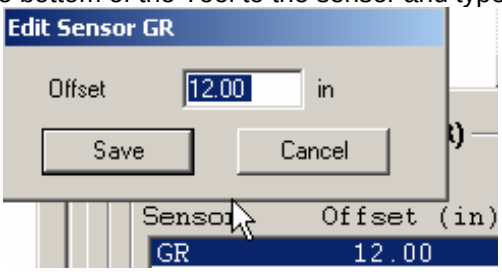


FIG: 4.54 Edit Offset Sensor.

Gaussian set as Gamma Ray default filter

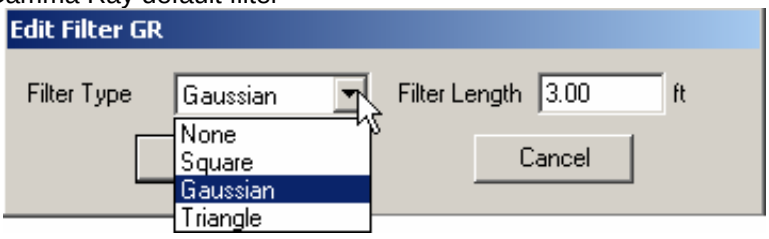


FIG: 4.55 Edit Sensor Filter.

Gamma Ray Calibration type set Two point as default

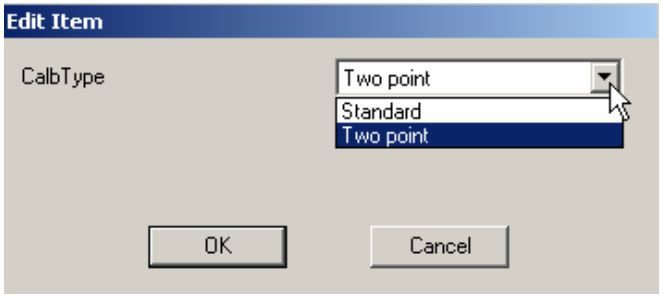


FIG: 4.56 Edit Calibration Type.

For statistical tools 45 second is a default value.

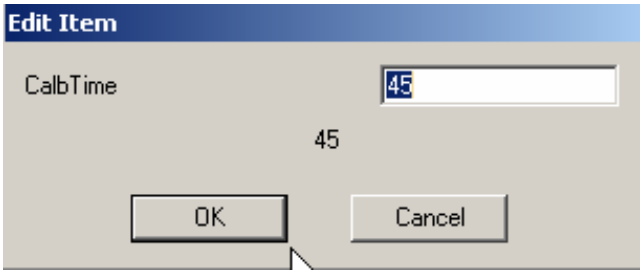


FIG: 4.57 Set Calibration Time

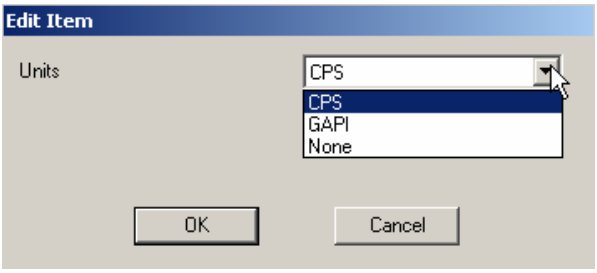


FIG: 4.58 Select Units

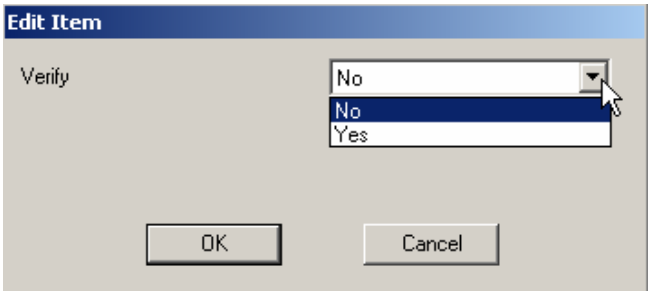


FIG: 4.59 Select Verify

4.5.1.5 Tool Diagram Properties

The diagram section of the tool editor allows the used to select or create tool diagrams for the tool model. If no Name is entered, the tool will be represented in tool string diagrams as a rectangle with the length and diameter given in the Model Specific area. The browse button next to the name box can be used to select an existing Warrior tool diagram.
The selected tool diagram will now appear in the diagram window.

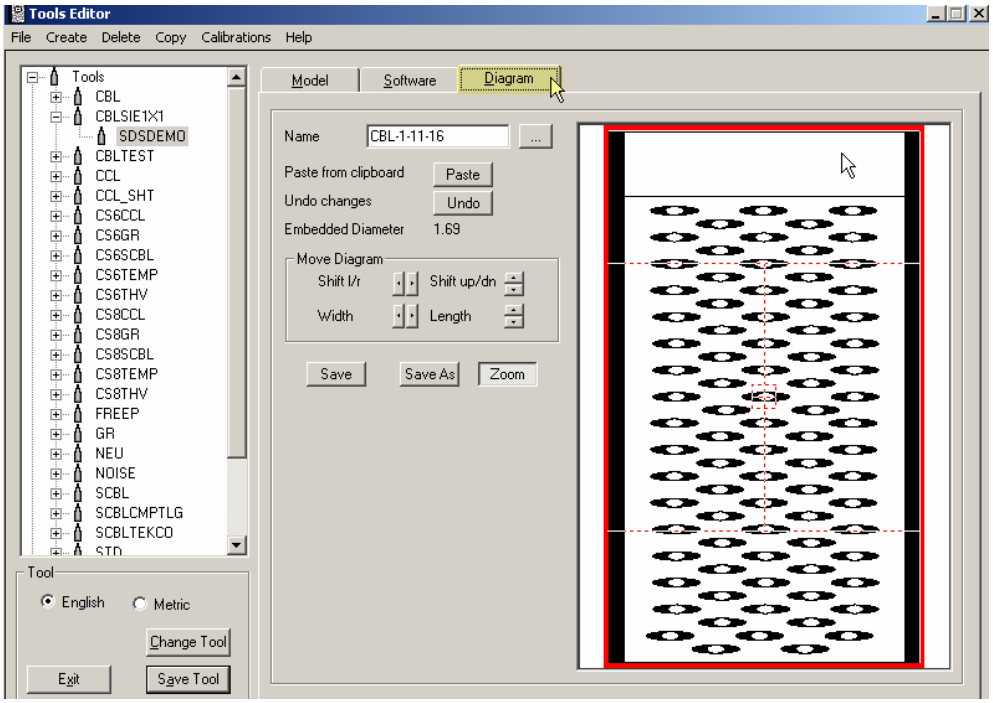


FIG: 4.60 Select Tool Diagram

The Zoom button can be toggled to change the display to see the complete width that will be displayed in a tool string diagram, although the length may not be to scale.

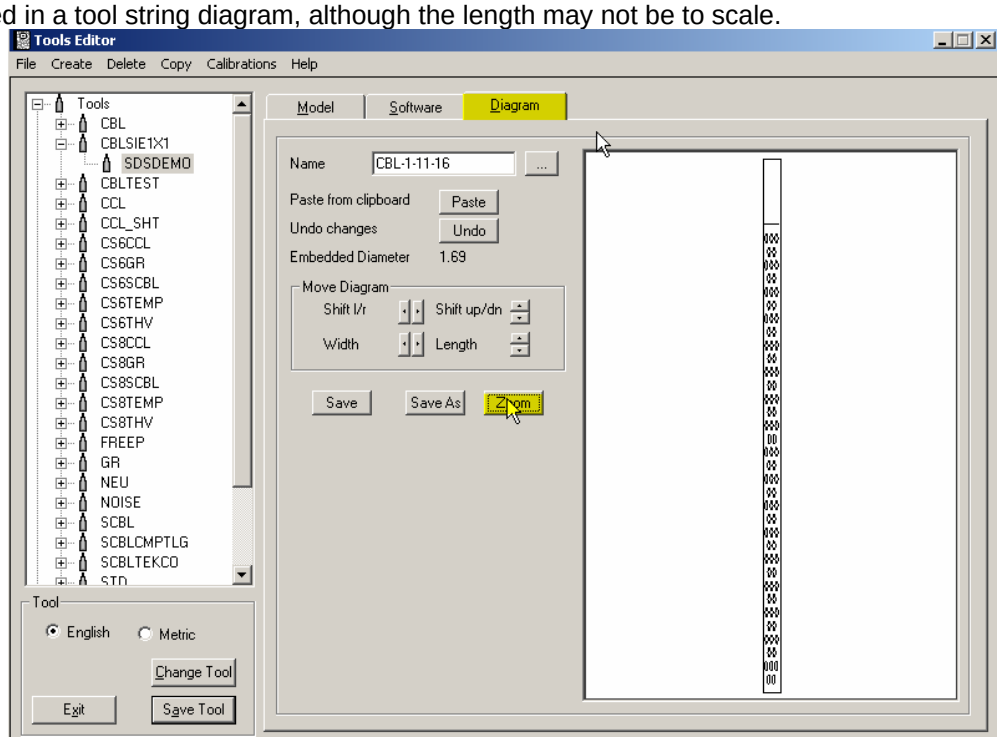


FIG: 4.61 Select Zoom Tool Diagram

In the zoom mode, the red rectangle reflects the appropriate length and diameter specified for the tool. The user can now use the controls in the Move Diagram box to resize and configure the drawing as needed to shift the drawing left/right or up/down or to widen/narrow or lengthen/shorten the drawing. Ideally, the body of the tool should fit the red rectangle, with external components (centralizer springs, etc.) allowed to extend outside of the red rectangle.
Within the red rectangle, there are four quadrants. The mouse can be used in each of these quadrants to configure the diagram in the same manner as the Move Diagram controls. By clicking the mouse in the top quadrant and dragging it up or down, the diagram will move up or down. Clicking and dragging up or down in the bottom quadrant will lengthen and shorten. Clicking and dragging to the left or right in the left quadrant will move the diagram left or right. The right quadrant will widen or narrow the diagram.

4.1.5.6 Customizing Tool Diagrams

If you want to create your own tool diagrams using a third party graphics package, the only requirement is that the output file format be either Windows Metafile (*.wmf) or Windows Enhanced Metafile (*.emf). Once you have created the file, copy it to your warrior\format directory and rename it to (*.wtd) for Warrior Tool Diagram.
In order for any diagram to line up when it is placed in a tool string, it needs to be modified by using the Tools Editor. Select the diagram you want to edit from the Tools Editor and the image should appear on the right side of the window. A red box will appear also which indicates the location where the image should appear in order for it to line up with another image of the same diameter. It is important that the image be sized using the proper diameter. If you have two devices that you want to use the same image for but they have different diameters, then you need to save two different tool diagrams, one for each diameter.
To size the image, use the buttons to change the width and height as well as shift the image up/down and left/right. You can also use the mouse to drag the image into position. The mouse moves the image by clicking and dragging from the appropriate portion of the screen.
Mouse click positions:

Left of center	- drag image left and right
Right of center	- drag image to change width
Top 1/4 of image	- drag image up and down
Bottom 1/4 of image	- drag image to change height

It may be easier to use the mouse for coarse adjustments and then use the buttons to make fine adjustments.
Some tools, such as centralizers, may extend outside the red box.
When you click the save button, the image gets written to disk and then read back and redrawn to verify that the save was done properly.

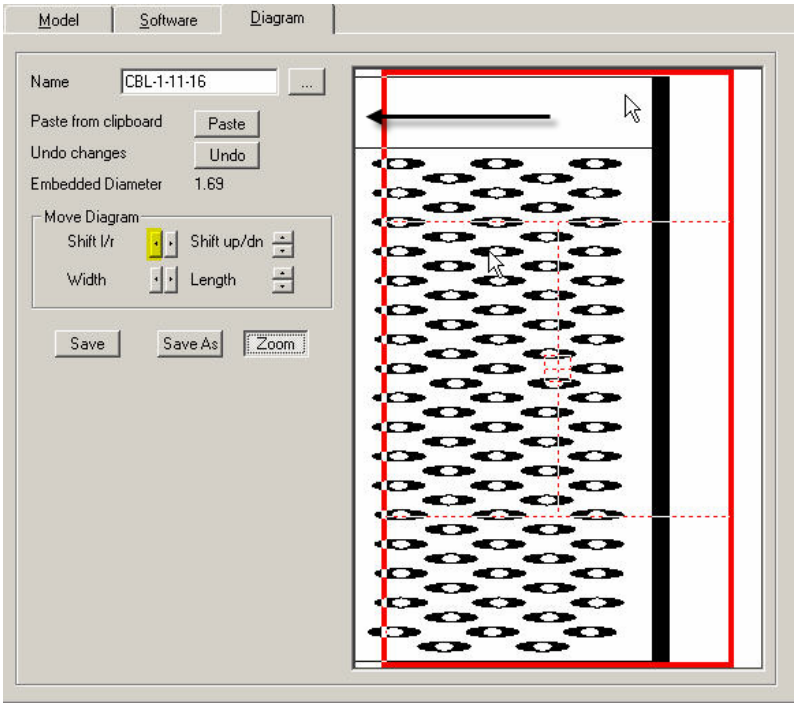


FIG: 4.62 Move Left the Tool

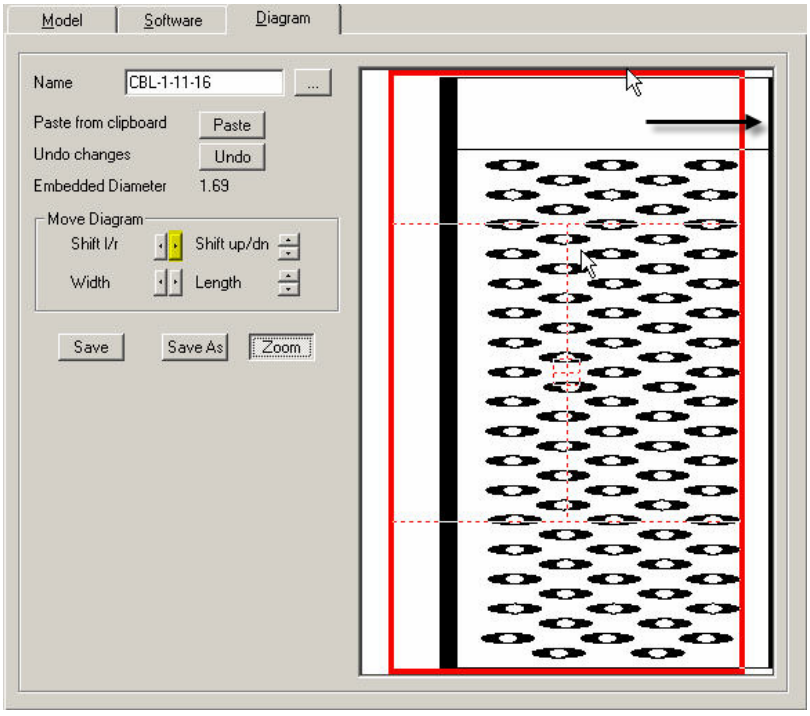


FIG: 4.63 Move Right the Tool

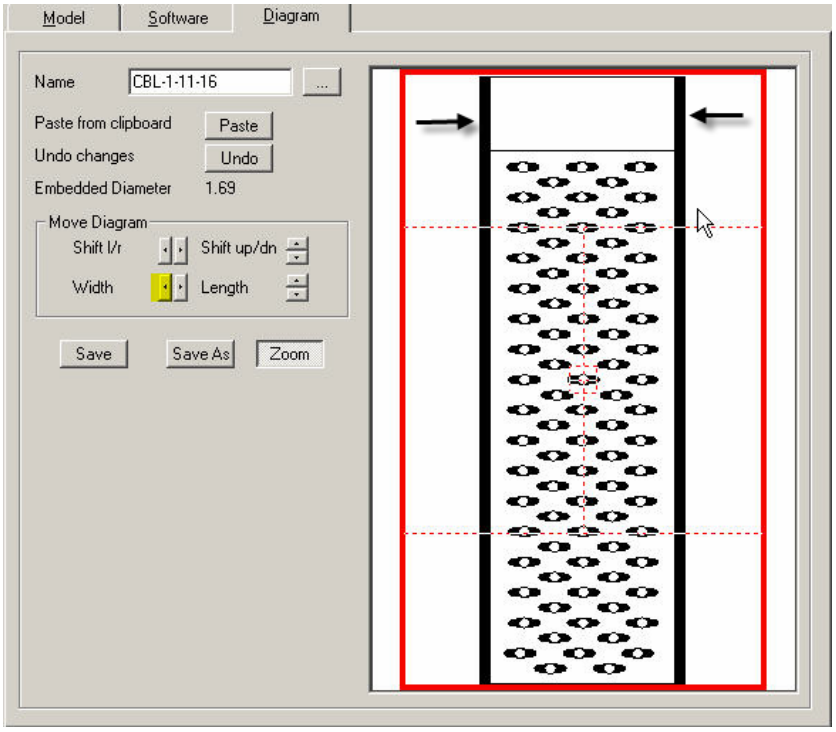


FIG: 4.64 Shrink the diameter of the Tool

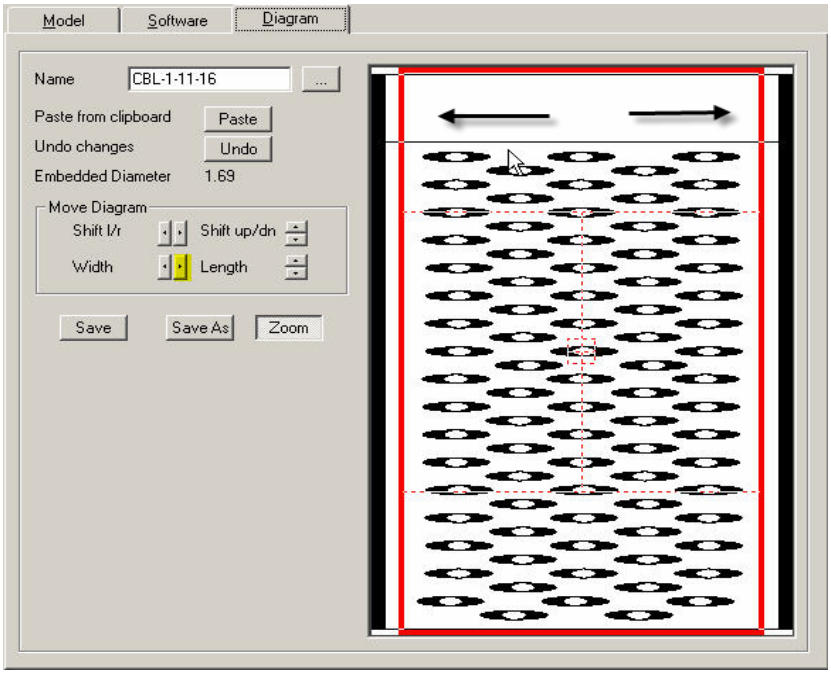


FIG: 4.65 Increase the diameter of the Tool

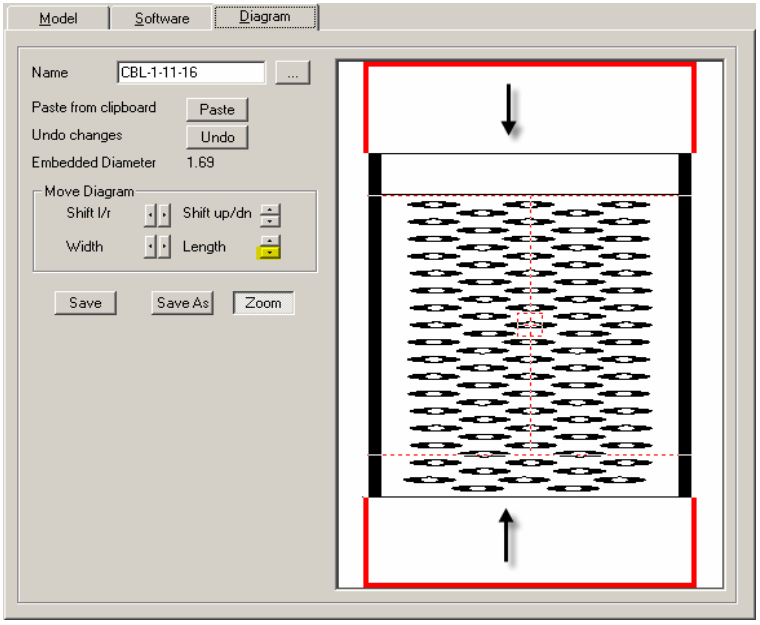


FIG: 4.66 Shrink the Length of the Tool

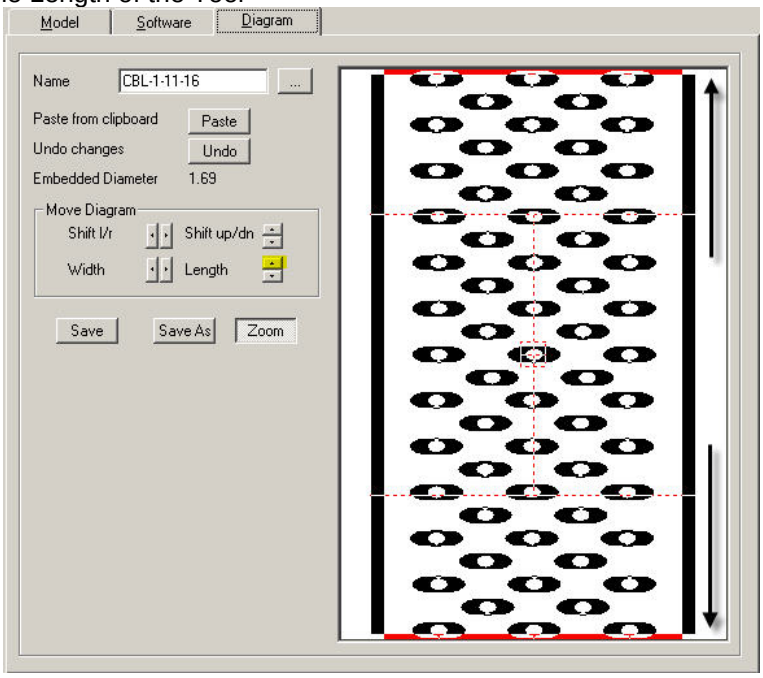


FIG: 4.67 Increase the Length of the Tool

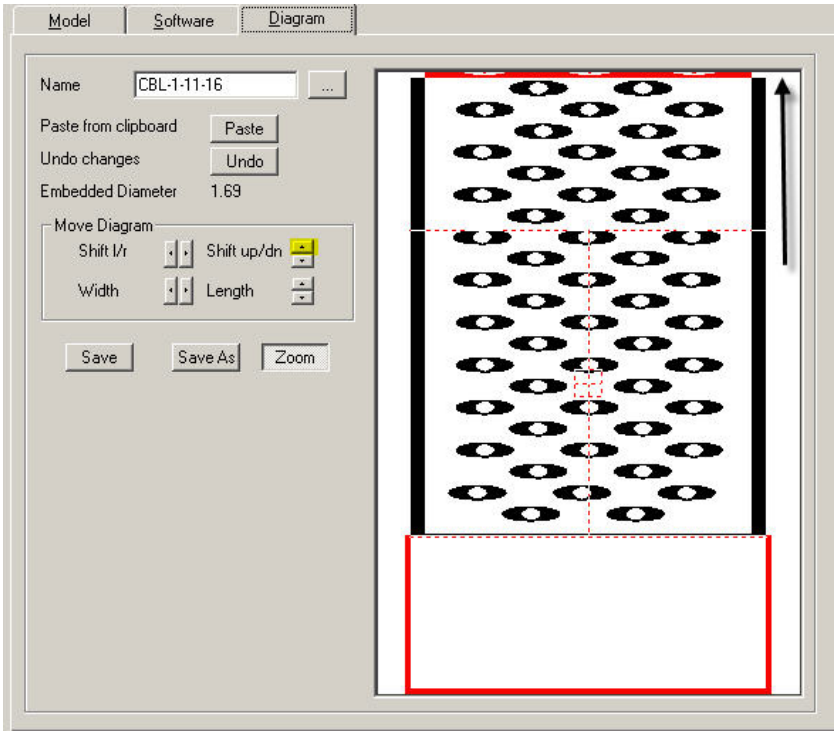


FIG: 4.68 Move up the Tool

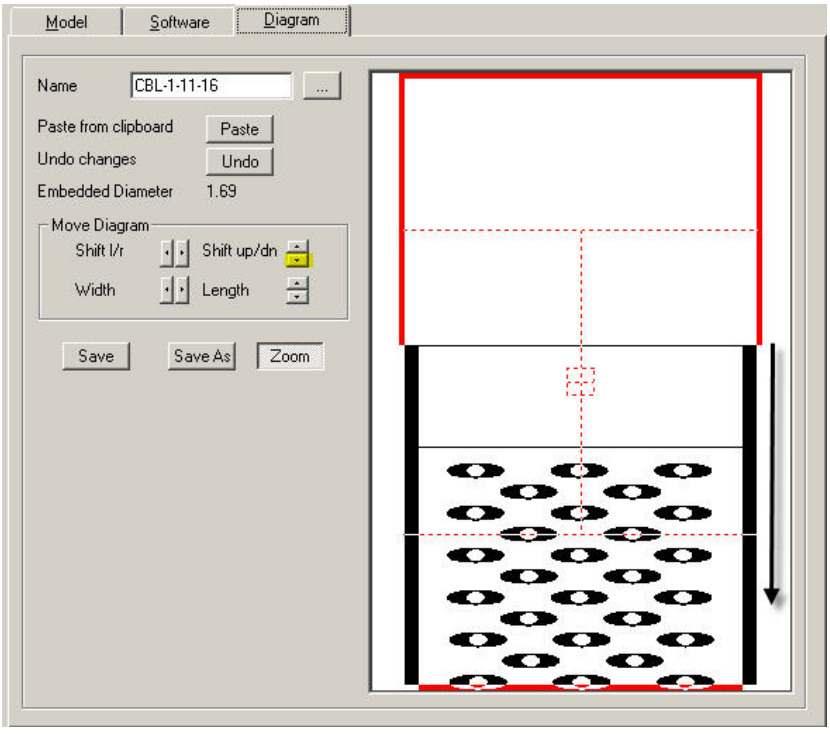


FIG: 4.69 Move Down the Tool.

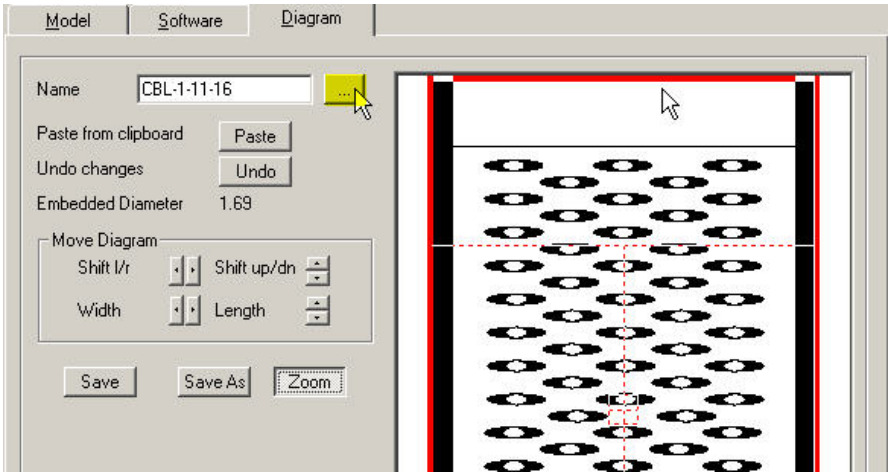


FIG: 4.70 Browse Tool Diagram

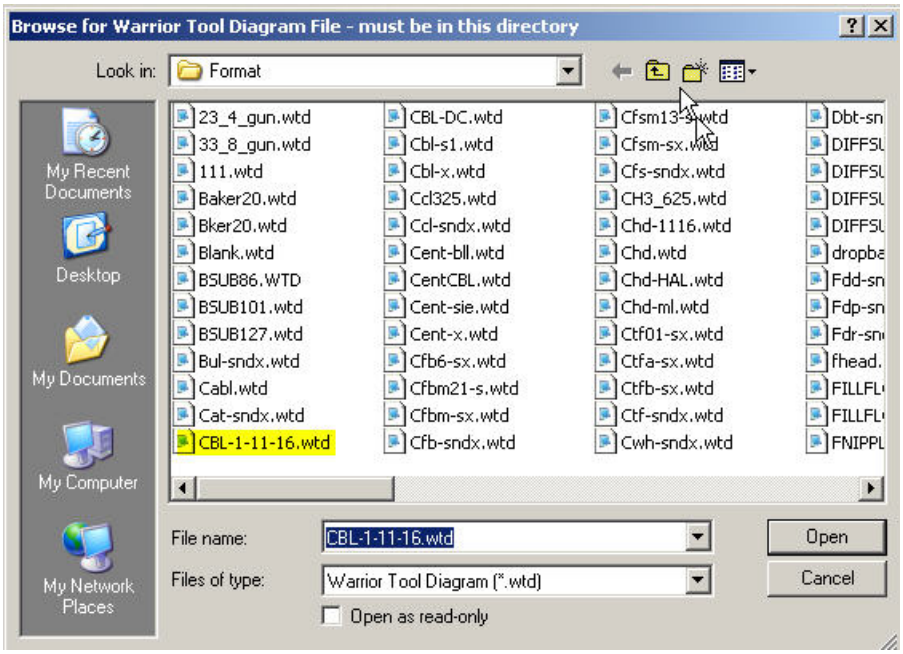


FIG: 4.71 Select Tool Diagram

Once the diagram has be resized and configured as desired, the Save and Save As buttons can be used to save the diagram as a Warrior Tool Diagram. The Save button will replace the existing diagram that was called up. Be aware that if any other model of tool uses this diagram, the drawing will be changed for that model also. The Save As button will prompt you for a new file name.
The Undo button, will undo any changes that have been made since the file was opened or since the last **Save** or **Save As.**

4.5.1.7 Variable Length Items

To change the length of a variable length item, right click on the item and select Length from the pulldown menu.

4.5.1.8 Options

When clicking on the Options button, a number of options appear below the tool tree diagram. These include the sensor offsets, where to break diagrams of long tools and the scale factor of the diagrams.

For long tools, select the **Break item** option and then enter a break length. You may have to toggle the Break item checkbox to update to a new break length. This will draw any tool that is longer than the break length with a break in the middle so you can fit more objects in a smaller area.

Choose a different **Scale Factor** to display the diagram at a greater resolution.
The **Show offsets** checkbox displays all the sensor names in the tool string and their offsets.

4.5.1.9 Print

Any tool diagram will print to fit on one page. When another scale factor than **<auto>** is selected, two print choices are available. You can print to fit on one page or you can print to scale. If you print to scale, the image may span multiple pages.

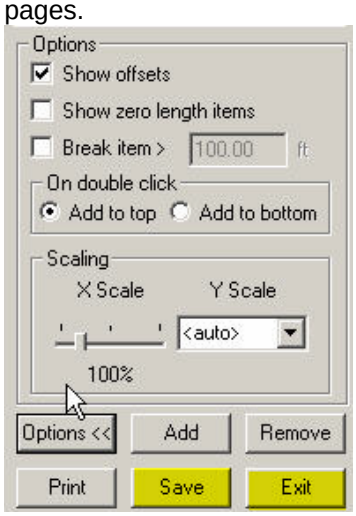


FIG: 4.72 SAVE and Exit

VIDEO: 4.4 Tool String

4.5.2 Variables

The **Variables** Editor is invoked from the Acquisition **Edit** menu or from Warrior shortcut folder, double-click the **Utilities** icon. The Utilities menu box will appear, Click on the **Edit Variables in a Dataset** button. It is used to enter and edit zoned Parameters for use by the logging system. When first invoked it appears similar to the window shown Below. Displays the Variable (parameter) editor window, enabling depth dependent parameters associated with the selected service to be zoned and values to be set.

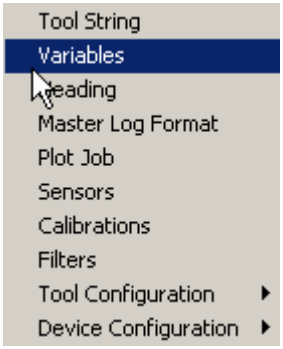


FIG: 4.73 Variables

A file selection dialog box appears. Select the required database, followed by the log pass (dataset). The Variable Editor is displayed with the variables that were active during the logging session.
In this case the well is shown as one zone from top to bottom. To define a new zone press the **Zones** Button and a window will appear as shown below.

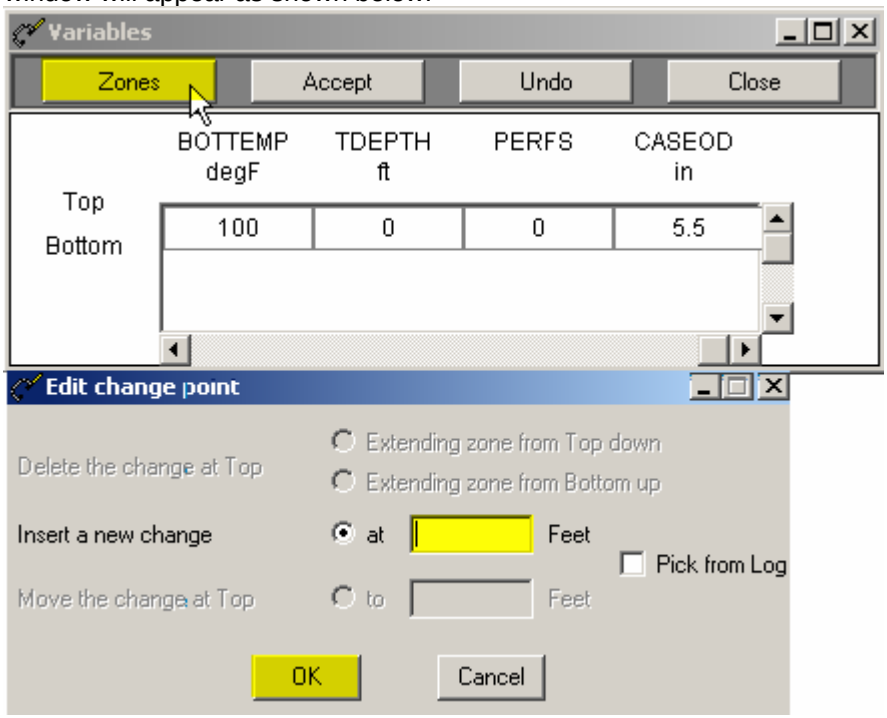


FIG: 4.74 Add Zones

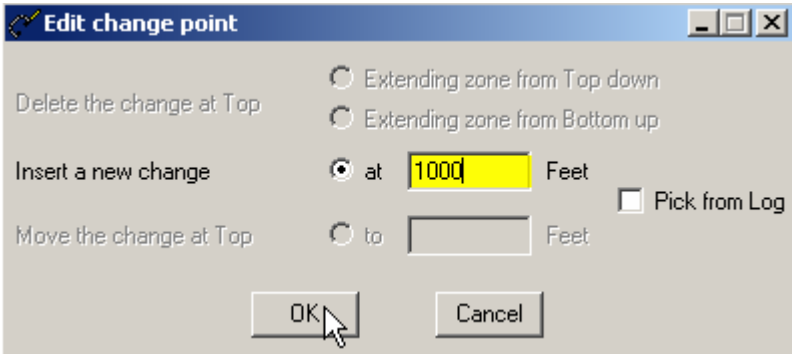


FIG: 4.75 Set a New Zone

Here boundaries may be inserted and their positions changed, e.g. inserting a new change at 1000ft results in two zones, one from the top to 1000, and one from 1000 to the bottom.
Note: if the variable editor is started from the acquisition module when logging, then by selecting the **Pick from Log** checkbox, the depth of zone changes can be selected by clicking on the appropriate depth on the interactive plot.
Here boundaries may be inserted and their positions changed, e.g. inserting a new change at 1000 ft Results in two zones, one from the top to 1000, and one from 1000 to the bottom.

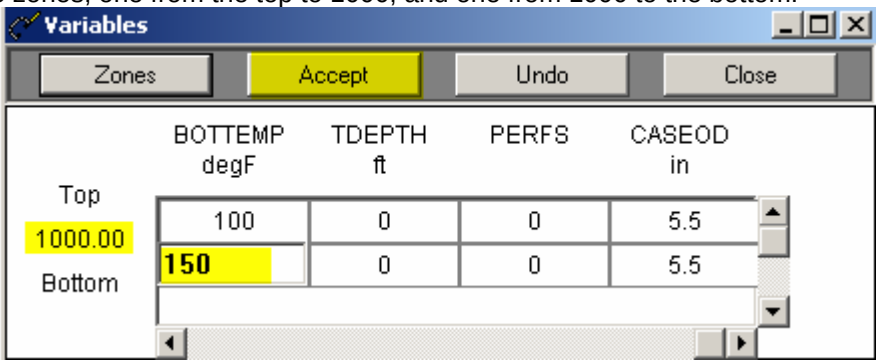


FIG: 4.76 Edit values and accept

To change the value of the variable in a particular zone, TAB to or click on the variable and enter the New value. When all entries have been made **Accept** the changes and **Close** the editor.

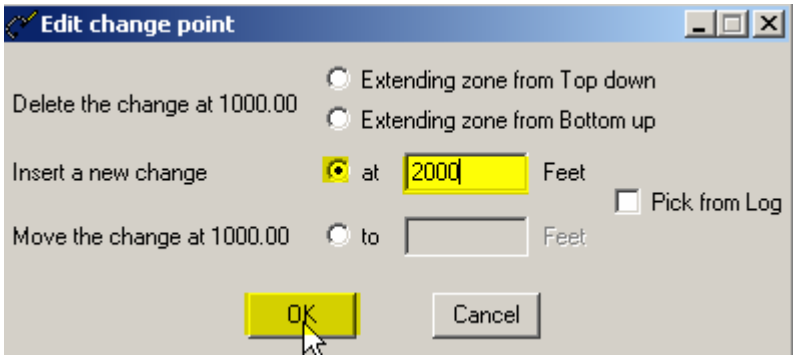


FIG: 4.77 Insert New Zone

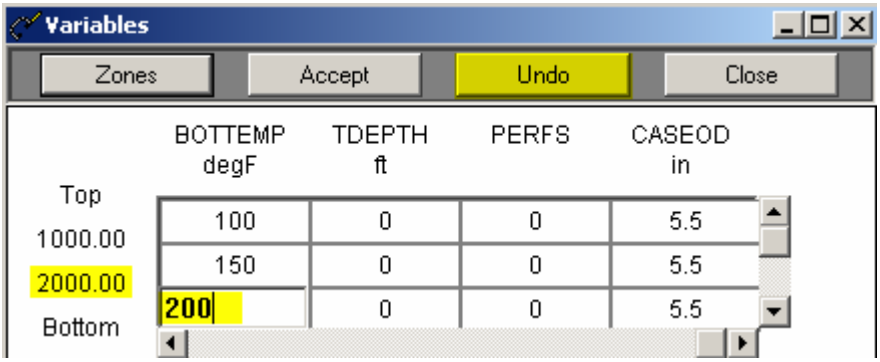


FIG: 4.78 Undo Zone

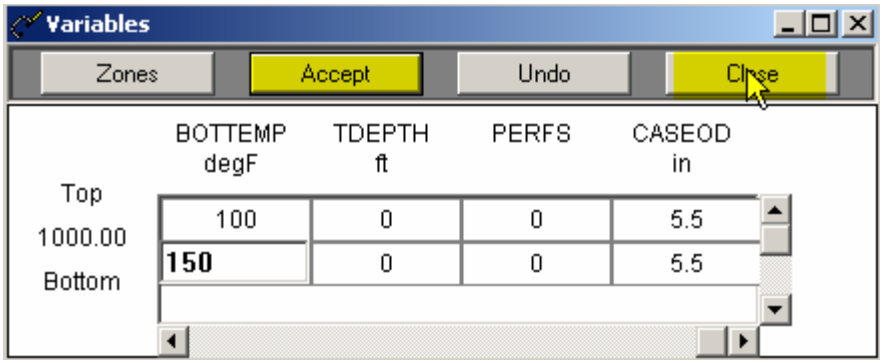


FIG: 4.79 Accept and Close

VIDEO: 4.5 Variables

4.5.3 Create a Variable in a Dataset

In the Warrior shortcut folder, double-click the **Utilities** icon. The Utilities menu box will appear. Click on the **Create Variables in a Dataset** button.

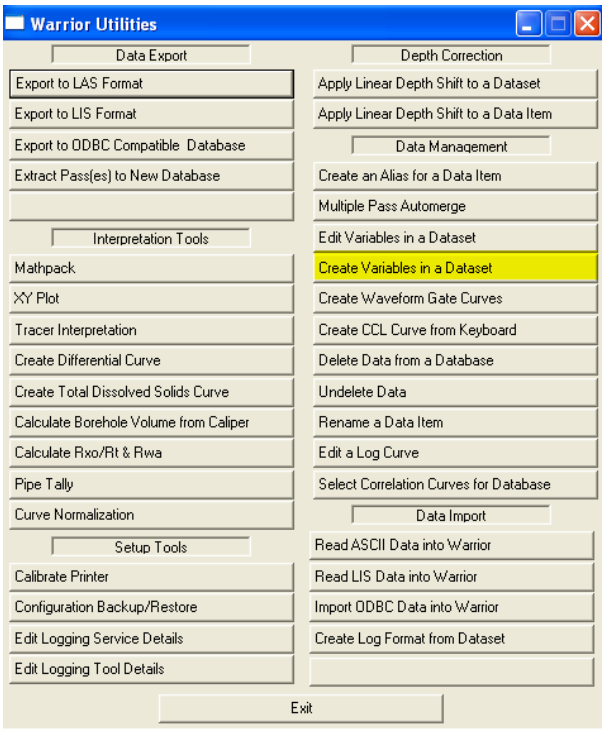


FIG: 4.80 Create Variables in a Dataset

A file selection dialog box appears. Select the required database, followed by the log pass (dataset). At this point a selection box is displayed allowing selection of the variable to be created in the log pass. Fig: Create Variables in a Dataset Double-click on the required variable name to create it in the pass variables.

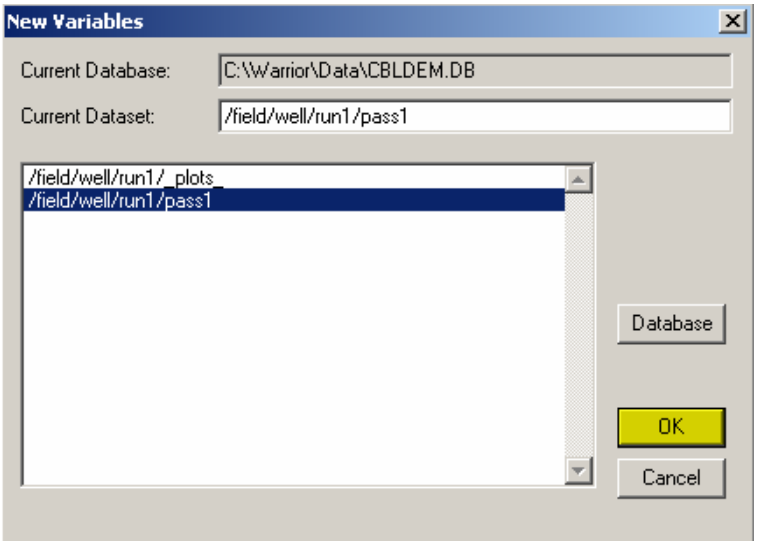


FIG: 4.81 New Variables

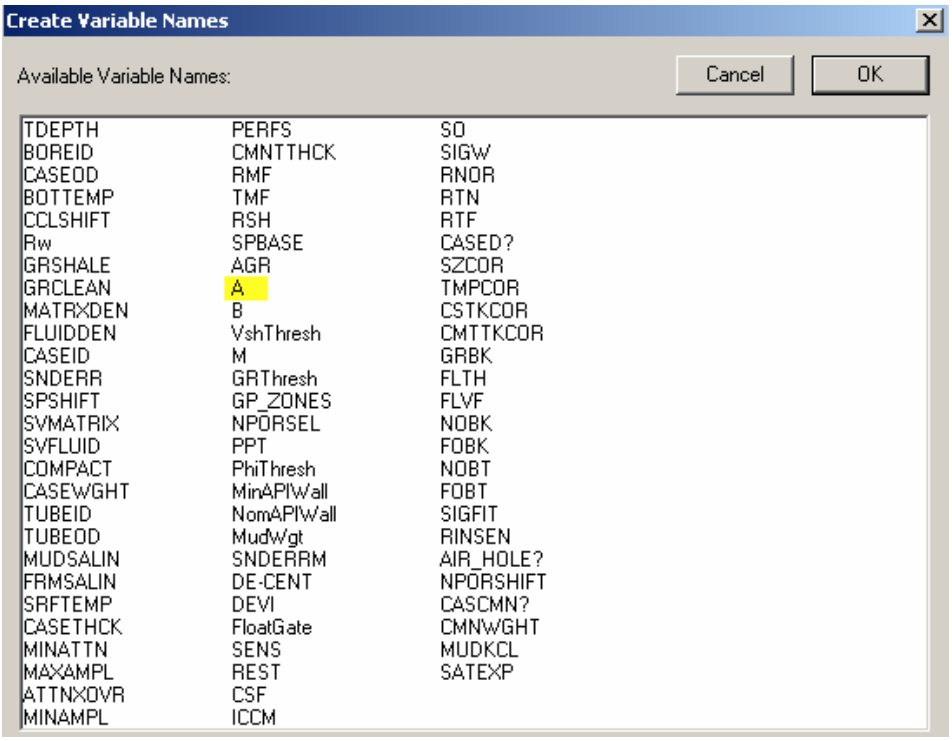


FIG: 4.82 Choice the Variable

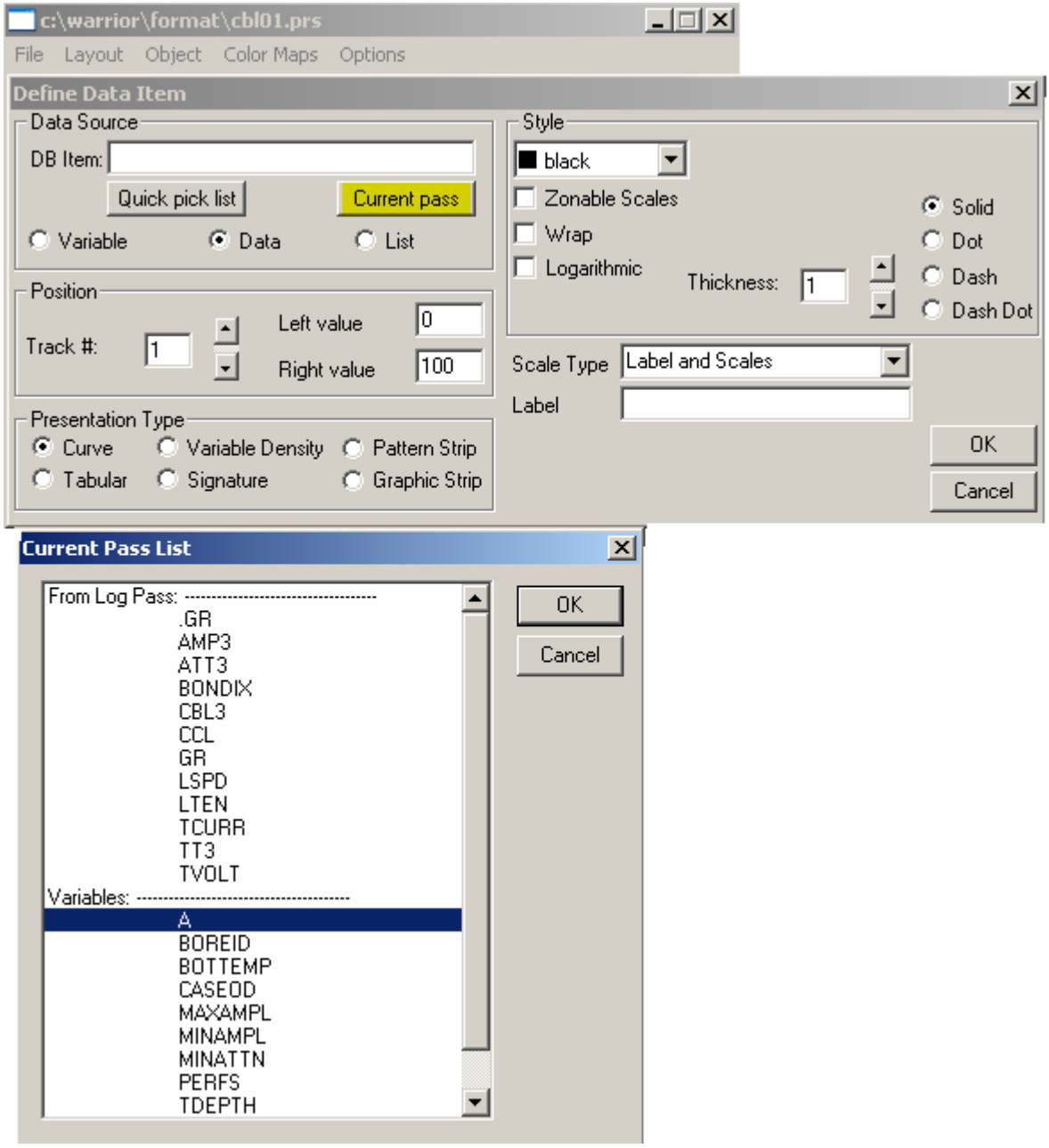


FIG: 4.83 Current Pass List

4.5.4 Create waveform gate curves

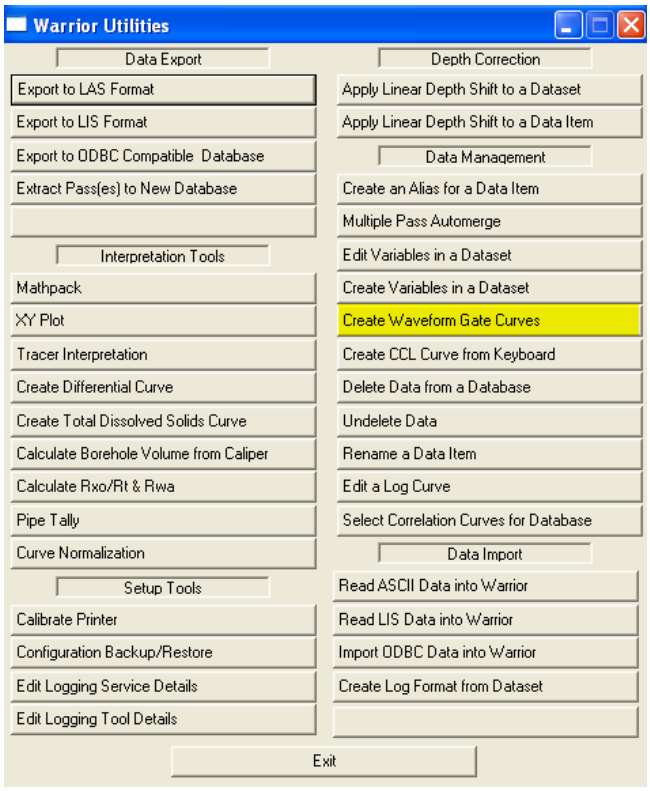


FIG: 4.84 Create waveform Gate Curves

Select the Database

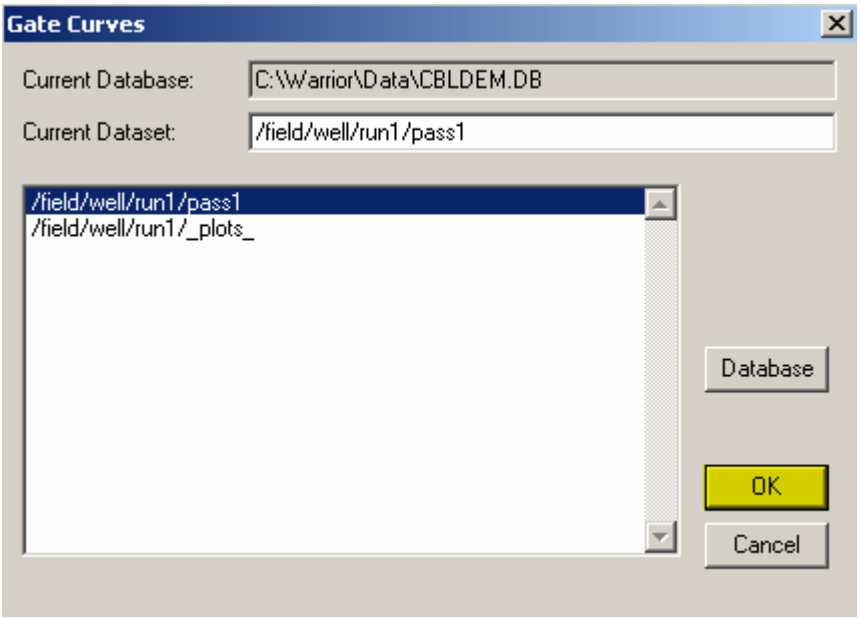


FIG: 4.85 Gate Curves

This option is used to generate the high and low gate curves for sonic tools (e.g. CBL and RBT). You are prompted to select a database and pass containing a sonic tool with waveform data. The high and low gate curves are then automatically generated and added to the pass.

When a CBL tool is in the database Warrior looks for the CBL3 and CBL5 waveform curves in the pass and generates CBL3LG (3ft low gate) and CBL3HG (3ft high gate) if the CBL3 curve is present, and the CBL5LG and CBL5HG if the CBL5 curve is in the database.
These curves can be added to the Signature track as shown below in Fig:4.86 , and the low and high gate curves should straddle the first peak in the waveform.

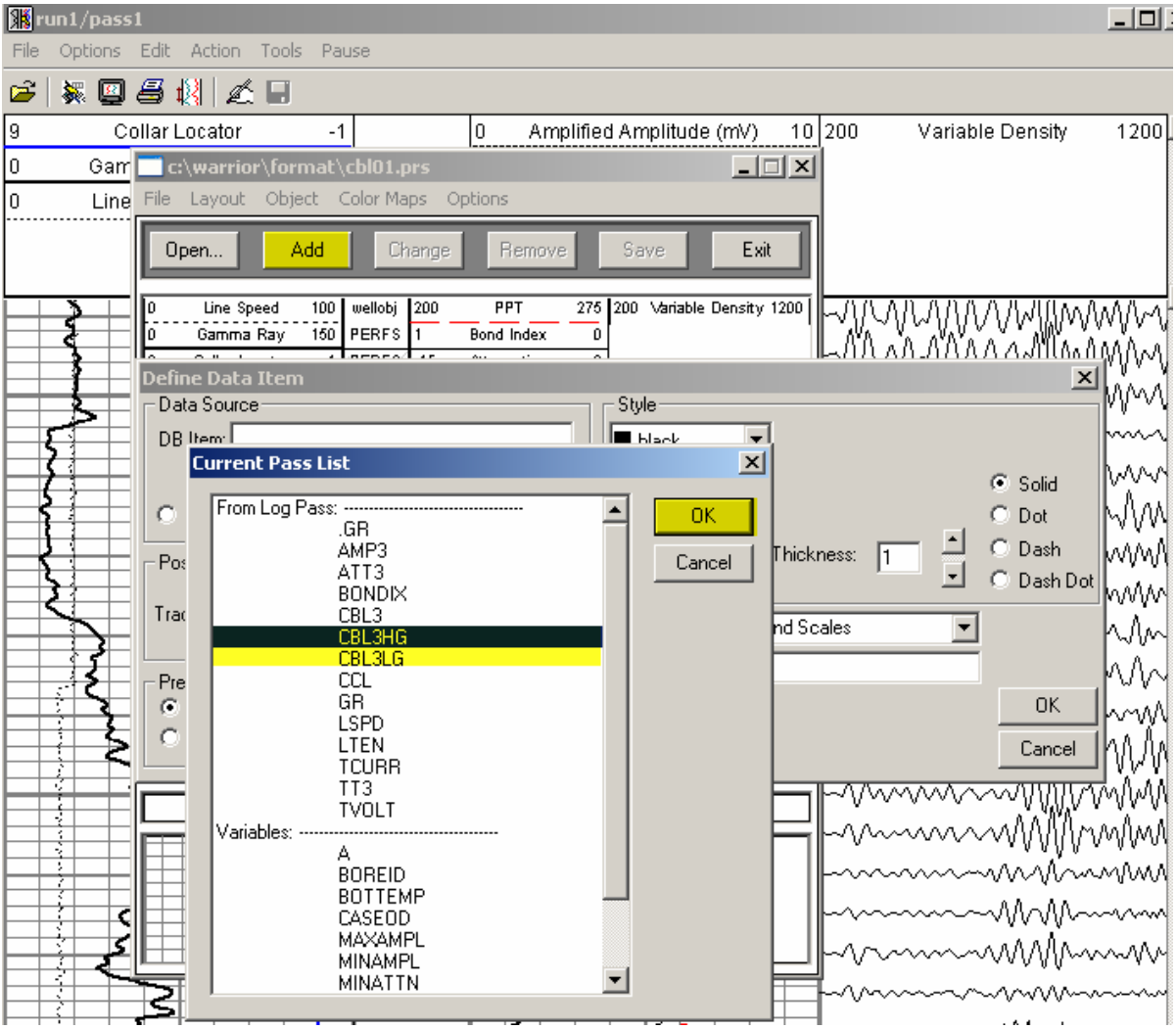


FIG: 4.86 Current pass List

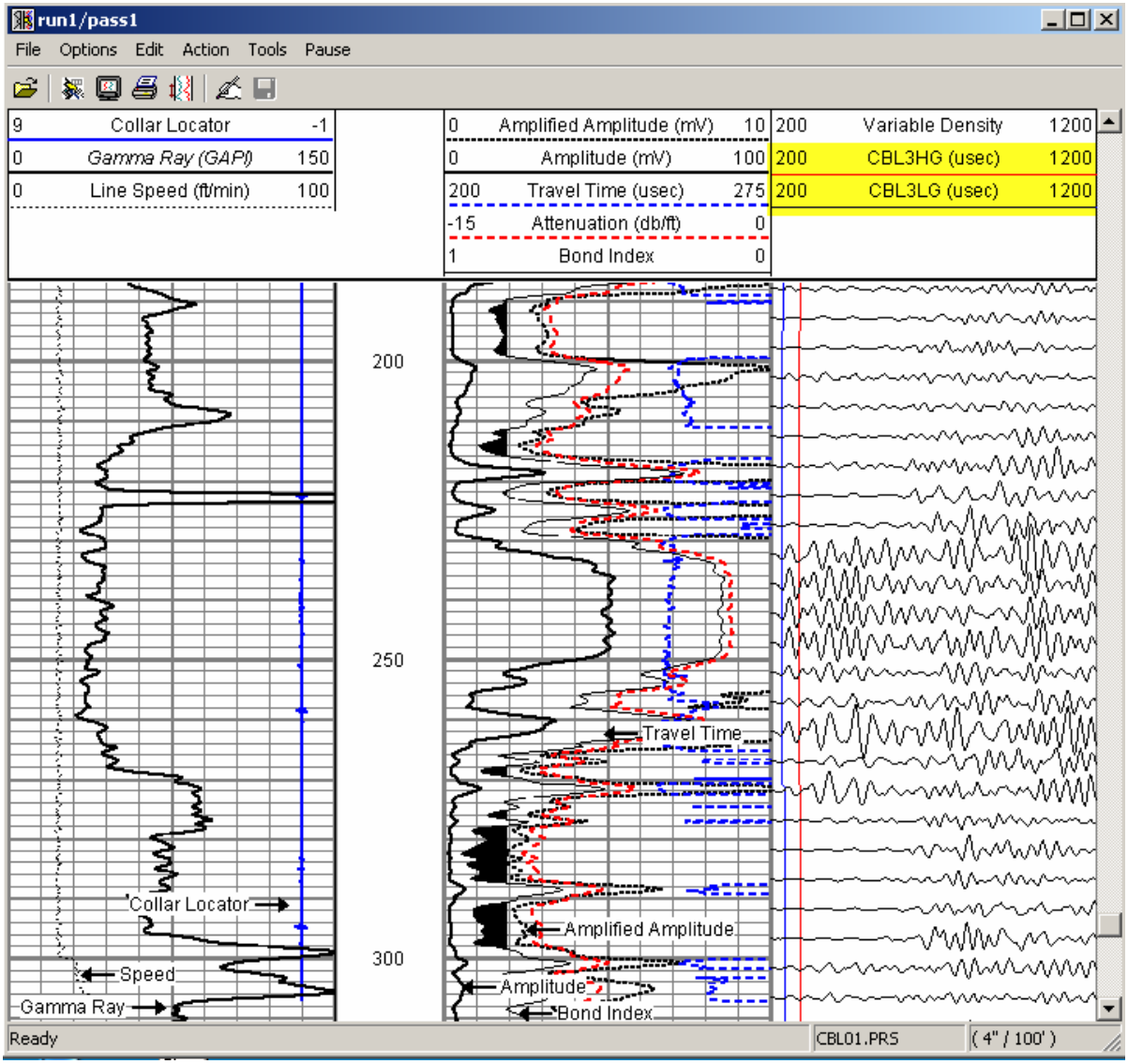


FIG: 4.87 Plot Curves

4.5.6 Sensors

Brings up the Edit Sensor window. Once a service has been selected, the Edit Sensors window may be displayed and information concerning the individual sensors, associated with the particular service, may be edited. This information normally consists of the hardware source of the sensor (Device and Channel number), the depth offset of the sensor from tool zero reference, and the sampling rate.

The information contained in Edit Sensors is defaulted to the current service and current tool string information. For example, sensor depth offsets are derived from the selected tool string and the information is contained in the tools database. The default sample rates and device channel assignments are derived from the services file.

The default device and channel settings, and the default sample rates are contained in the services.ini file. The default depth offsets are derived from tool information contained in the tools.ini file.

Although the information in Edit Sensors is normally derived automatically from the information contained within the system, it may sometimes be necessary to modify a setting.

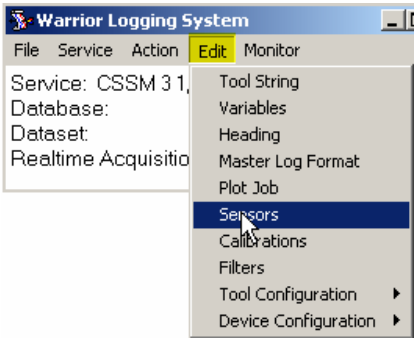


FIG: 4.88 Edit Sensors

Select **Sensors** from the **Edit** menu. The Edit Sensors window appears as shown below.

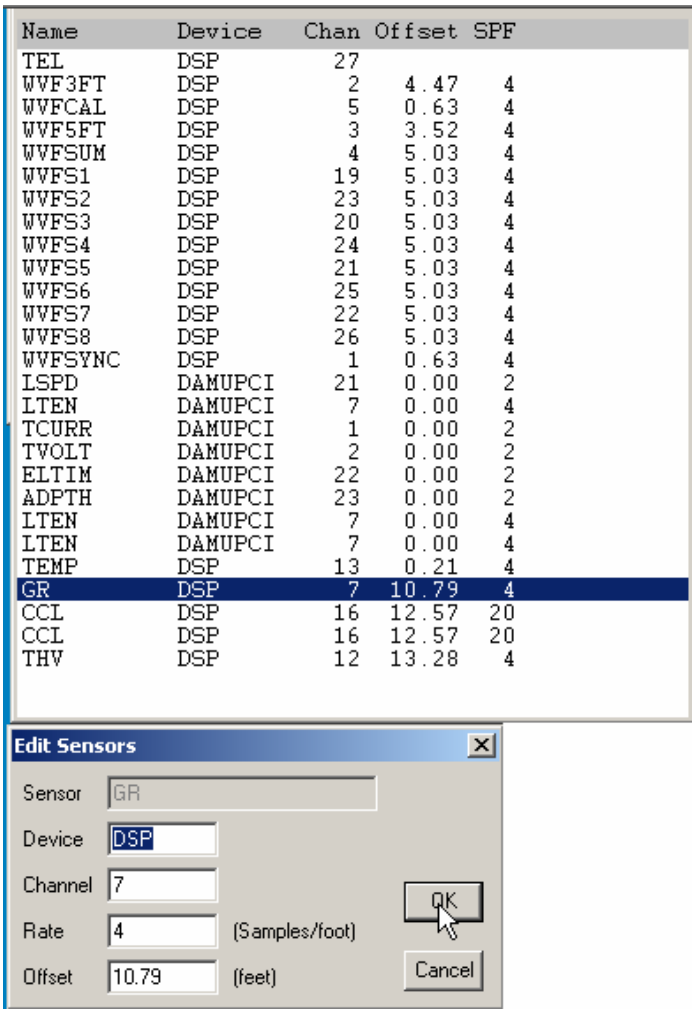


FIG: 4.89 Edit

Highlight one or more sensors and select **Edit**, or double-click on a sensor item. The Edit Sensors dialog box will be displayed for editing as shown in Fig: 4.7.1. The acquisition device may be selected with the **Device** box. There are several acquisition devices supported within the Warrior system. Do not change this entry unless you know what you are doing. The channel of the device, from which the

sensor is to be read, is selected by editing the **Channel** box. Do not change this entry unless you know what you are doing.
The number of samples per foot to be recorded is entered in the **Rate** box. The maximum sample rate for a sensor is generally limited to the maximum rate set for the particular acquisition device acquiring the data. This maximum rate is set in the services.ini file.
The physical depth offset of the sensor from tool zero is entered in the **Offset** box. Note that the value to be entered in Offset is the physical depth offset, as the system automatically compensates for any lags introduced by filtering.

Warning! The change made in Edit Sensors will remain in effect until the service is reloaded; when the sensor parameters are returned to their default values. Sensors should not be edited during logging.

4.5.7 Calibrations

Warrior allows editing of sensor calibrations. The Warrior system supports many types of calibrated tool response. The calibration parameters may be derived from manual entries, or from calibration procedures, performed by the system itself. Some calibration parameters can be edited from Edit/ Calibrations.

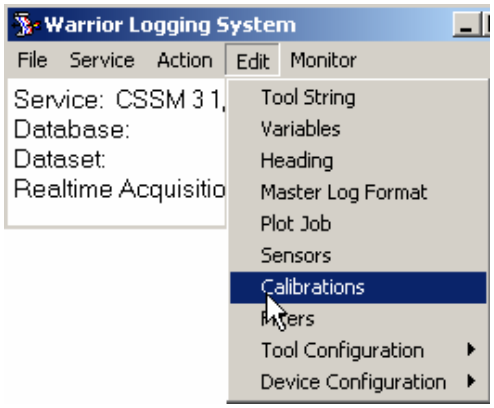


FIG: 4.90 Calibrations

Select **Calibrations** from the **Edit** menu, and double-click on the sensor to be edited. Alternatively, click once and select and Edit/Edit Selections.
The tool type, serial number, calibration name and calibration type are displayed, but cannot be edited. The various calibration parameters can be edited and saved either permanently (with the **Perm** button) or temporarily (with the **Temp** button). See Fig: 4.91.

Warning! Warrior stores calibrations internally in English units. When editing calibrations in this dialog, the reference values must always be entered in English units.
Changes made and saved temporarily stay in effect until the service is reloaded, so when the calibration parameters are returned to their normal permanent values.

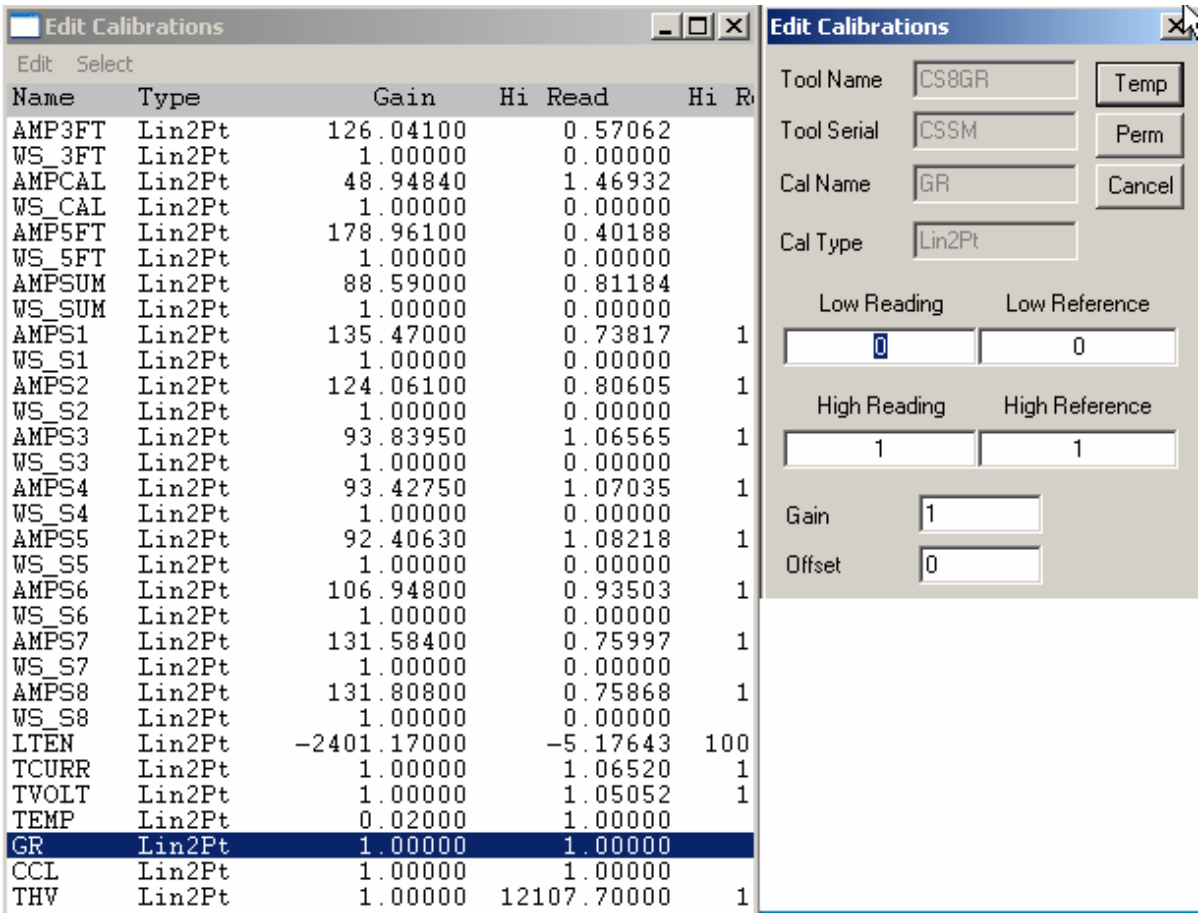


FIG: 4.91 Edit Calibrations

4.5.8 Filters

The **Filters** option displays filter settings and allows them to be edited. Four types of filter options are currently available in the Warrior system.

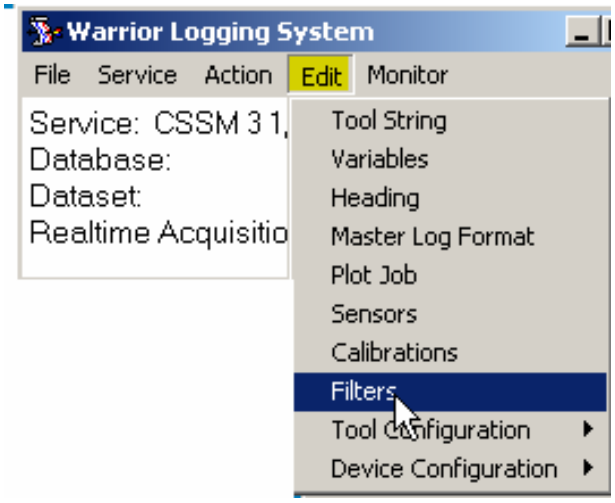


FIG: 4.92 Filters

These are:
SQUARE is a simple average of the sensor value over the filter interval selected.
GAUSSIAN is a weighted average, where the weights, applied to each sample over the interval, take the form of a Gaussian distribution. The filter interval is in feet, when recording in depth, and in seconds, when recording in time.
TRIANGLE is another weighted average that accentuates peaks similar to the Gaussian filter. The Triangle filter is more extreme than the Gaussian.
USER is a user-defined filter, but is currently not implemented.
Select **Filters** from the **Edit** menu, and double-click (or single-click and Edit/Edit Selections) on the sensor, whose filter is to be edited.

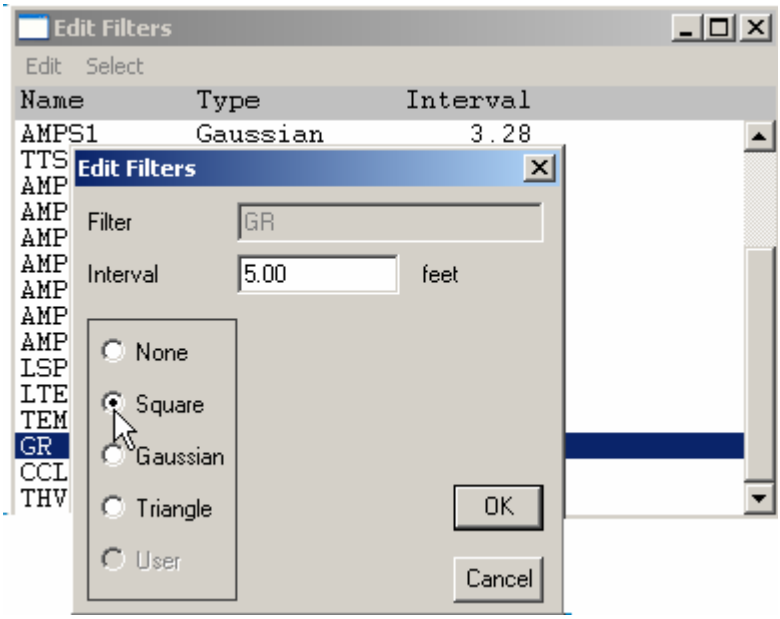


FIG: 4.93 Edit Filters

The tool type and current filter parameters are displayed for the sensor selected. Typing over the parameter, shown in the Interval box, may change the interval. The filter type can be changed by means of the radio buttons.
Note that changes, made here, stay in effect until the service is reloaded, so when the filter parameters are returned to their default values. Default filter settings are contained in the tools file as part of the tool model information. Filters should not be edited whilst logging.

4.5.9 Tool Configuration

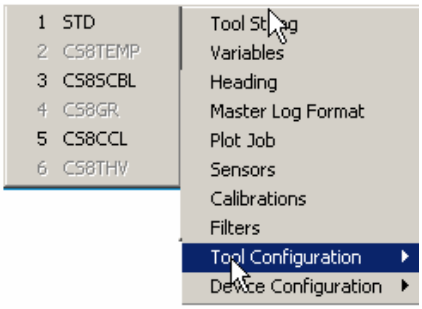


FIG: 4.94 Tool Configuration

4.5.9.1 STD Tool Configuration

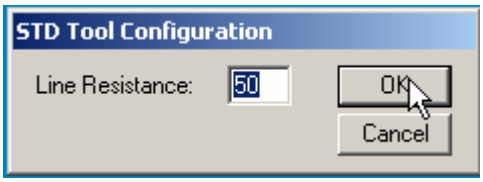


FIG: 4.95 Set Line Resistance

4.5.9.2 CCL Control

The CCL software produces 2 outputs:

CCL Casing Collar Locator
CCLRT Real Time Casing Collar Locator

The real time output bypasses the normal sampling queues so that changes can be seen immediately. The **CCL** software incorporates a facility to effect a shift of the CCL curve, as is sometimes required when running perforating services. The collar log may also be filtered in such a way as to remove noise from the baseline of the curve while still allowing collar signals above a certain threshold to be displayed.
When in Acquisition mode, and with a collar tool in the string, the **CCL Control** box may be displayed with **Edit/Tool Configuration/CCL**.

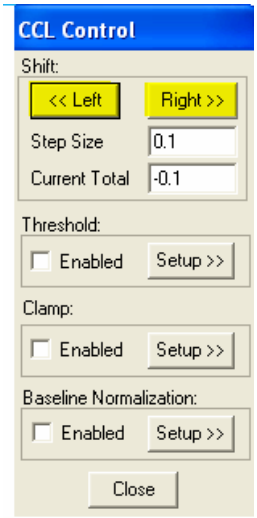


FIG: 4.96 CCL Control

4.5.9.3 Shift the CCL

Bring up the CCL Control box as described above.
Set the amount of shift required in the Step Size dialog. The value entered here should reflect the actual scale set for the log. For example, if the log is scaled at 1 volt per track and it is required to shift the curve 10 (small) divisions, enter a value of 0.1.
Clicking the Left or Right buttons produces the shift and the cumulative amount of shift applied appears in the Current Total box.

4.5.9.4 Threshold (Filter the CCL)

Invoke the CCL Control box and set the Threshold Enabled. Click on Setup and adjust the threshold settings as required.

The Positive and Negative Thresholds are set in the same units as the collar log output curve. Any collar curve signal smaller in amplitude than the threshold settings will be suppressed to a value of zero. Any signal greater than the threshold levels will be recorded as its true value.

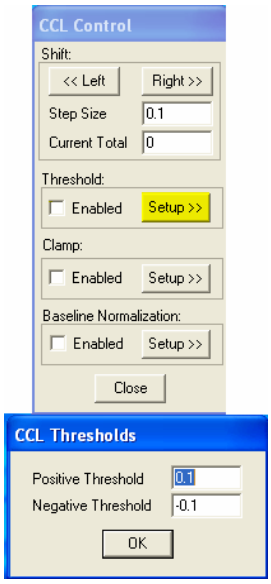


FIG: 4.97 CCL Thresholds

4.5.9.5 Clamp

The Positive and Negative Clamps cut the signal at the set point value. Any collar curve signal bigger in amplitude than the clamp settings will be set to clamp value.

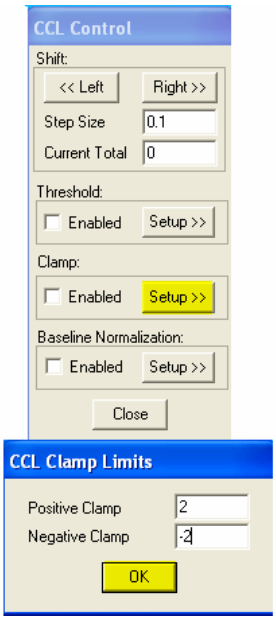


FIG: 4.98 CCL Clamp Limits

4.5.9.6 Normalize the CCL Baseline

Invoke the CCL Control box and set the Baseline Normalization Enabled. Click on Setup and adjust the cycle length (must be greater than 0) and the offset settings as required.
The system will attempt to correct a baseline that is changing with time.

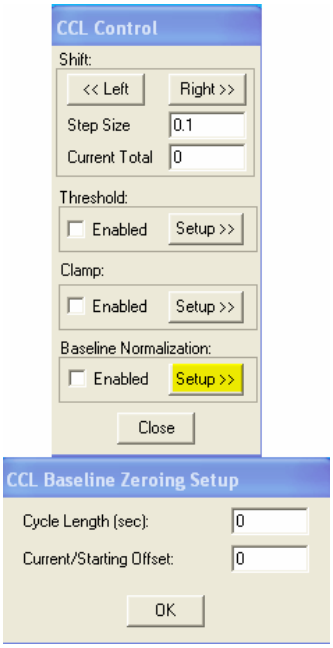


FIG: 4.99 CCL Baseline Zeroing Setup

Select **Setup**, and type in Cycle Length 2 left in Zero **Current/Starting Offset**.
Click over **OK**
Check on the Enable box, and Click on Setup, you find the new value in Current/Starting Offset

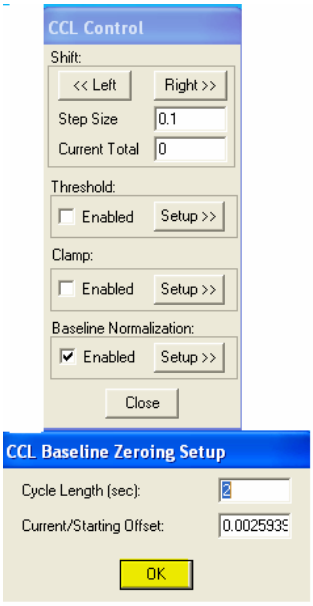


FIG: 4.100 CCL Baseline Zeroing Setup

4.5.10 Device Configuration

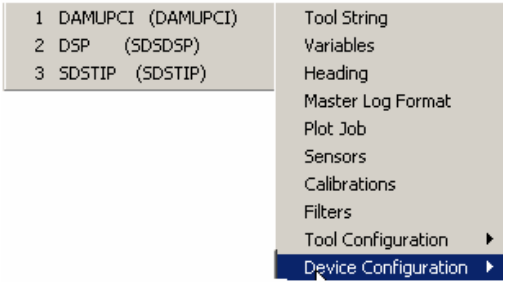


FIG: 4.101 Device Configuration

4.5.10.1 DAMUPCI Configuration

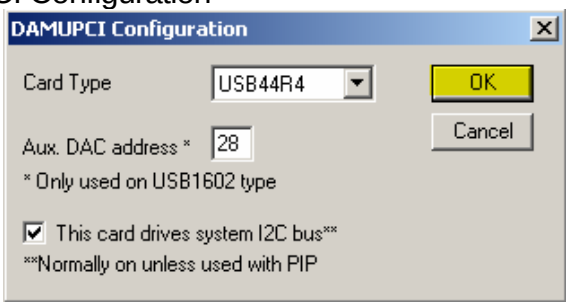


FIG: 4.84 DAMUPCI Setup

Do not change any settings here, unless you know what you are doing.

4.5.10.2 DSP Configuration

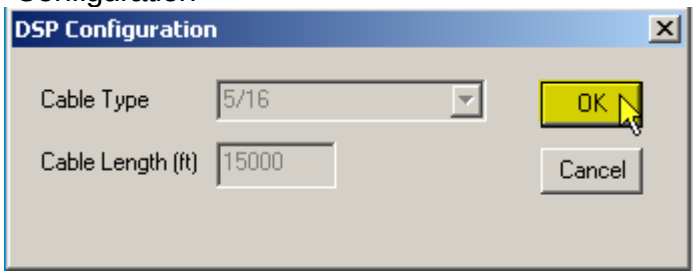


FIG: 4.102 DSP Configuration

4.5.10.3 SDSTIP and CBL1D Programmable Filters and Gain Controls

Most line signals, other than low frequency CCL signals, are filtered and amplified through the CBL1D board of the Scientific Data Systems, Inc. Tool Interface Panel. There is a single input to the CBL1D Board from the ANASW board but it has three separate outputs, commonly referred to as Sync, Sonic, and AUX. Each of these outputs has separate gain controls and programmable variable filter controls.

Each of the Sync, Sonic, and AUX output channels has a programmable attenuator that is controlled through the software by a slider bar in the panel controls. This is necessary to keep the signals from saturating during later stages of filtering and amplification. During normal operation, these are all that is necessary in a service to control the signal gains.

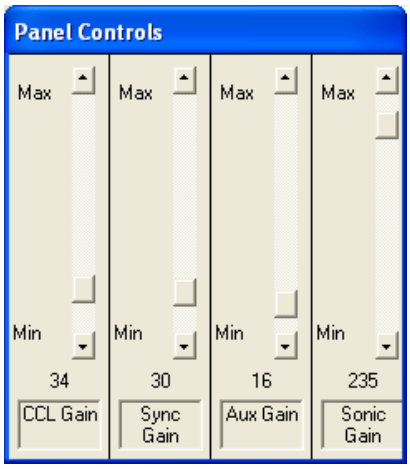


FIG: 4.103 Panel Controls

Each of the three channels also has a variable filter that can be set or adjusted. It is not normally necessary to adjust these filters once a service has initially been set up on a logging unit. Access for adjustment of these filters is obtained through the Acquisition Software by selecting Edit -> Device Configuration -> SDSTIP.

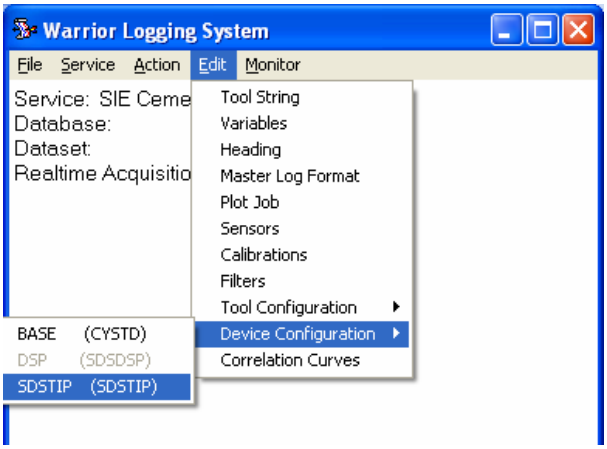


FIG: 4.104 Device Configuration

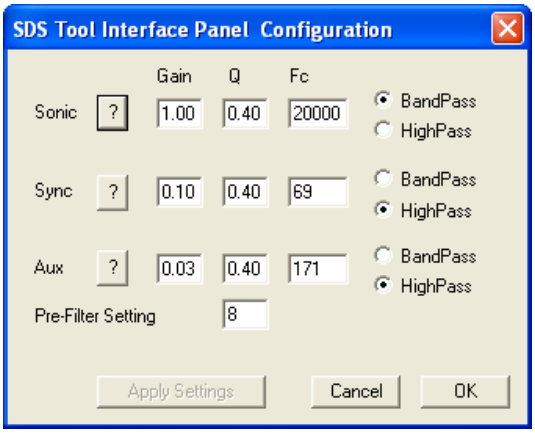


FIG: 4.105 SDSTIP

Each of the output channels has it's own Gain, Q, Corner or Center Frequency, and whether it has a Band Pass or High Pass output. In addition to this, the Sonic channel has a pre-filter to keep the initial input attenuator from saturating. This pre-filter is turned off with a 0 value and is normally turned on with a value of 8.
The Sonic and Aux channels will normally be set to filter a pulse signal, so they will usually have a High Pass filter with as low a corner frequency as possible. The gain for these channels should be set so that the slider bar gain control has a good setting for the service at near mid-range.
The Sonic channel will normally be looking at acoustic signals in the 20000 hertz range and should be selected as a Band Pass filter.
The Q of the filters is related to the how much frequency change is needed to attenuate the signal by 3DB. The larger the number, the less change from the Fc is needed to attenuate the signal.

The following Internet link gives simple explanations of filters and their characteristics. http://en.wikipedia.org/wiki/Electronic_filter#Multipole_types

The different hardware revisions of the CBL1D board require that the correct panel type be set in the Warrior Control Panel for the CBL1D board to respond to slider bar and filter settings. Revisions R1 through R4 will normally have a panel type that ends with the letter a (CPFA). As of this date, Revisions R5 and higher will have panel types that end with a B or C (CPFB – CPFC).

VIDEO: 4.6 Edit

4.6 Monitor

Once a service has been selected, various data monitors are available to the operator as shown Below.

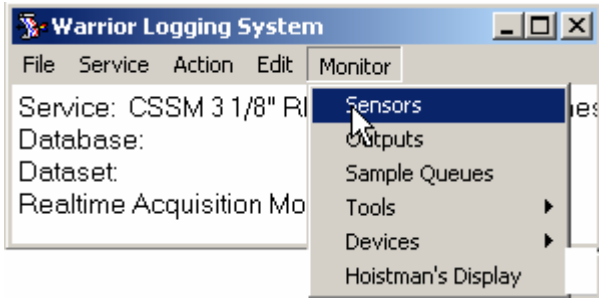


FIG: 4.106 Monitor Sensors

4.6.1 Sensors

The sensors for the selected service are displayed along with the values of their current readings. The sensor monitor is used to monitor `raw' data. Select **Monitor Sensors** from the **Edit** menu. The Sensor Monitor will be displayed. The sensor monitor is updated at the refresh rate set in the Control module.

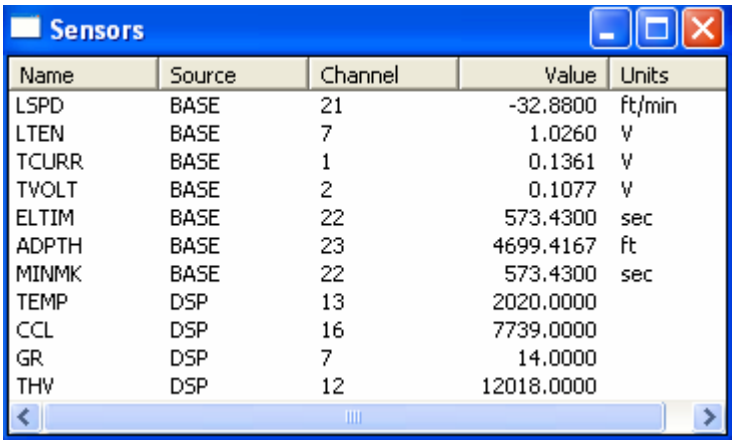


FIG: 4.107 Sensors

4.6.2 Outputs

The outputs for the selected service are displayed along with the value of their current readings in engineering units.

Select **Monitor /Outputs** from the menu. The Outputs monitor is displayed as shown in Fig: 4.108. When in a logging mode, e.g. Record Up, the readings are updated at each depth sample. When not in logging mode, the outputs are updated at the frequency set in the Control module.

Sampler Queues

Monitors the status of the internal Warrior sampler queues.

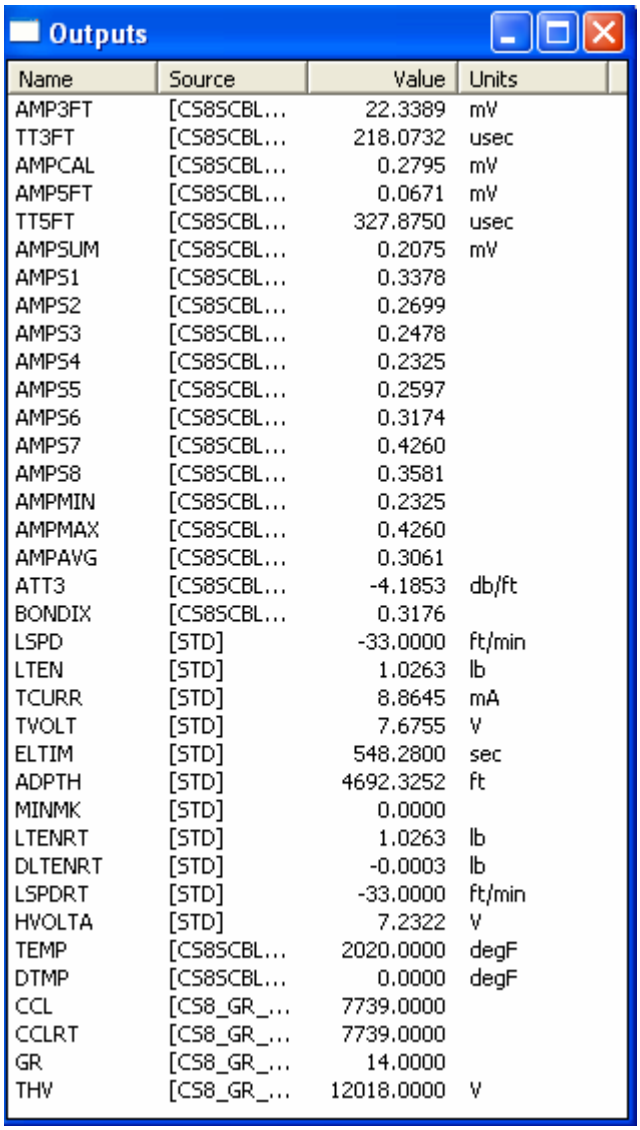


FIG: 4.108 Outputs

4.6.3 Tools

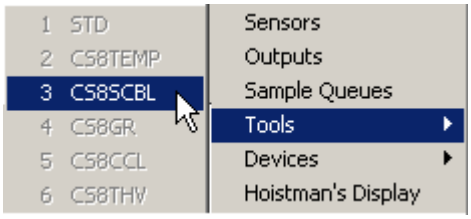


FIG: 4.109 Monitor Tools

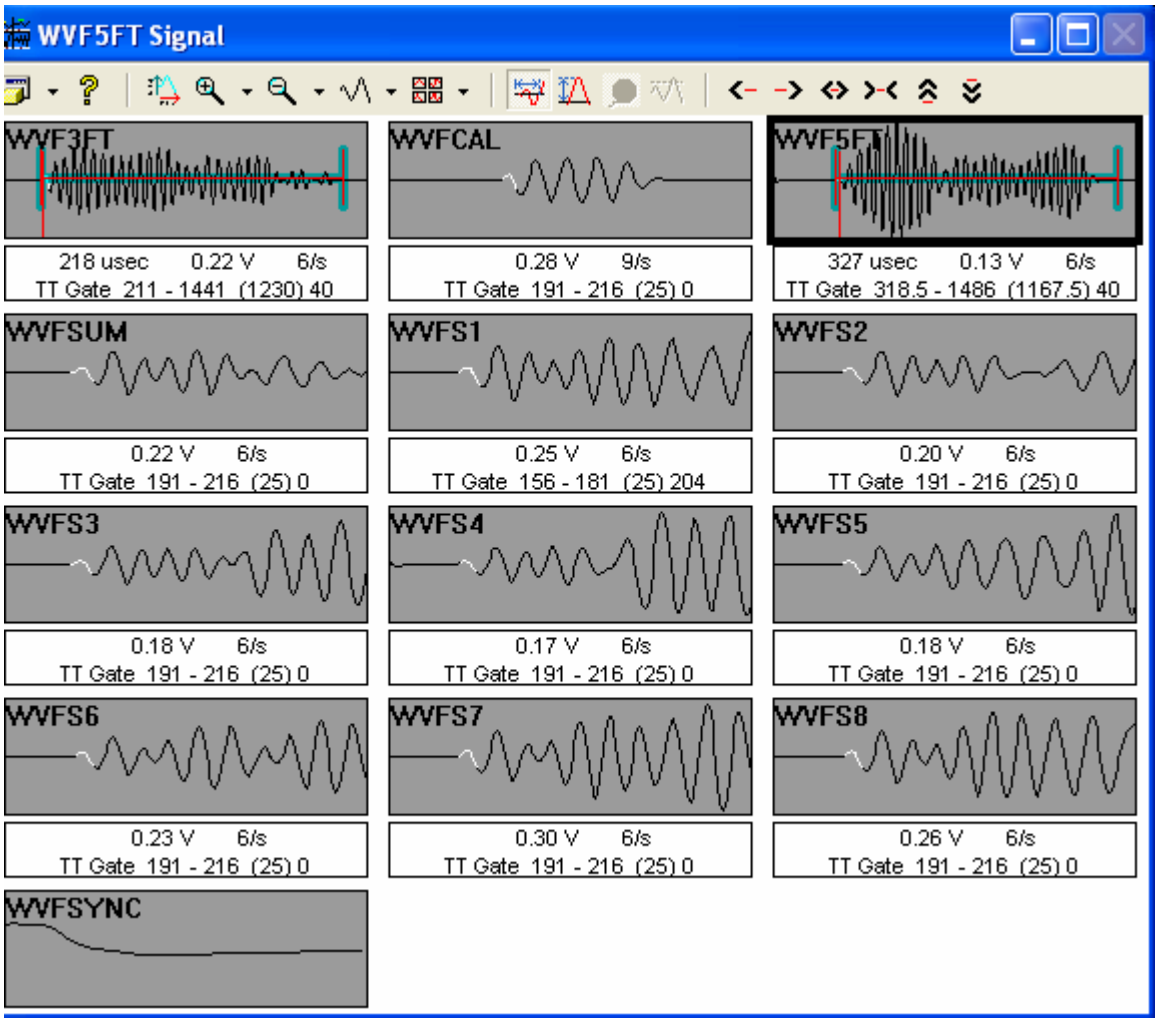


FIG: 4.110 Monitor CS8SCBL

4.6.4 Devices

Displays the raw data readings of the selected device, channels, irrespective of whether particular channels are being used for the current service.

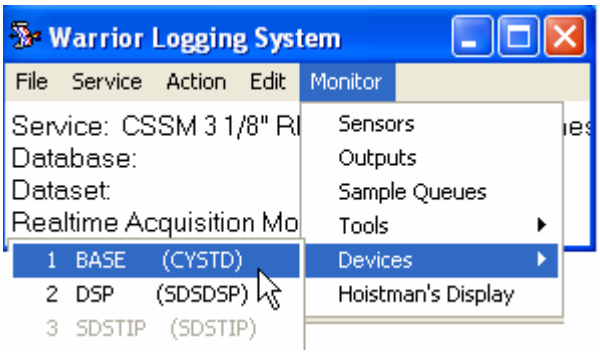
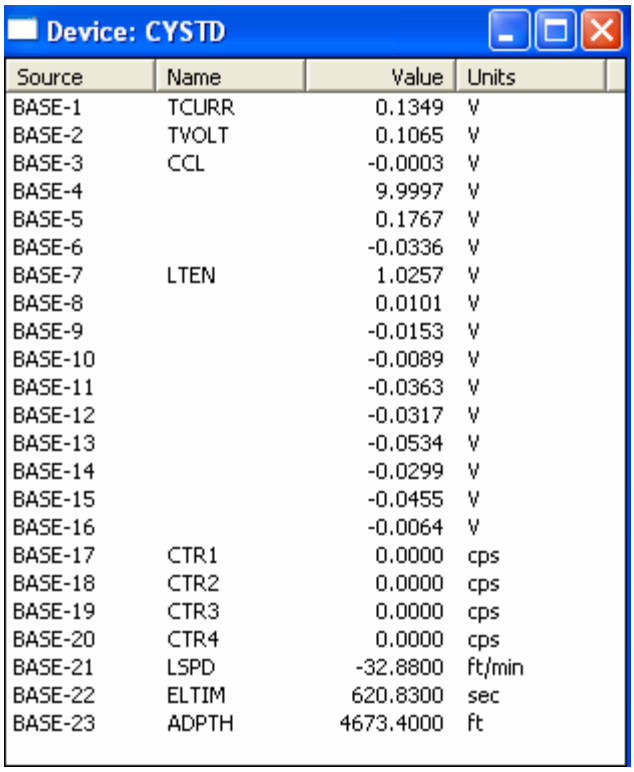


FIG: 4.111 Monitor Devices

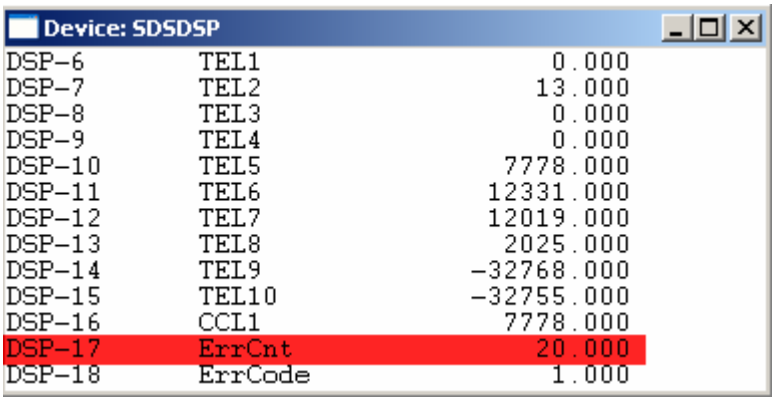
4.4.1 CYSTD



Source	Name	Value	Units
BASE-1	TCURR	0.1349	V
BASE-2	TVOLT	0.1065	V
BASE-3	CCL	-0.0003	V
BASE-4		9.9997	V
BASE-5		0.1767	V
BASE-6		-0.0336	V
BASE-7	LTEN	1.0257	V
BASE-8		0.0101	V
BASE-9		-0.0153	V
BASE-10		-0.0089	V
BASE-11		-0.0363	V
BASE-12		-0.0317	V
BASE-13		-0.0534	V
BASE-14		-0.0299	V
BASE-15		-0.0455	V
BASE-16		-0.0064	V
BASE-17	CTR1	0.0000	cps
BASE-18	CTR2	0.0000	cps
BASE-19	CTR3	0.0000	cps
BASE-20	CTR4	0.0000	cps
BASE-21	LSPD	-32.8800	ft/min
BASE-22	ELTIM	620.8300	sec
BASE-23	ADPTH	4673.4000	ft

FIG: 4.112 CYSTD Values

4.6.5.1 DSP Monitor



DSP-6	TEL1	0.000
DSP-7	TEL2	13.000
DSP-8	TEL3	0.000
DSP-9	TEL4	0.000
DSP-10	TEL5	7778.000
DSP-11	TEL6	12331.000
DSP-12	TEL7	12019.000
DSP-13	TEL8	2025.000
DSP-14	TEL9	-32768.000
DSP-15	TEL10	-32755.000
DSP-16	CCL1	7778.000
DSP-17	ErrCnt	20.000
DSP-18	ErrCode	1.000

FIG: 4.113 SDSDSP

The ErrCnt should have a constant value or Zero to get a good sync.

4.6.6 Hoistman's Display

The Hoistman's display can be loaded by clicking on Monitor / Hostman's Display or the **Hoist** button in the **Depth Control** window. Activating the popup menu can configure the view and scales. Do this by right clicking on the display and selecting the required menu option. Sound alerts for various conditions can also be configured here if a suitable sound card and speaker are available.
Note that in multi-monitor systems, the Hoistman's display can be positioned on a second monitor close to the winchman.

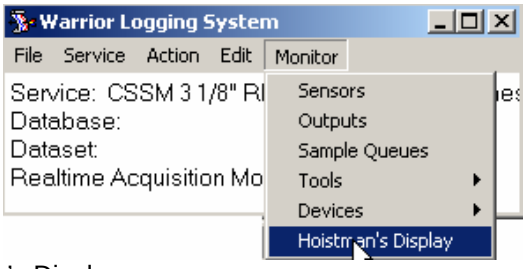


FIG: 4.114 Monitor Hoistman's Display

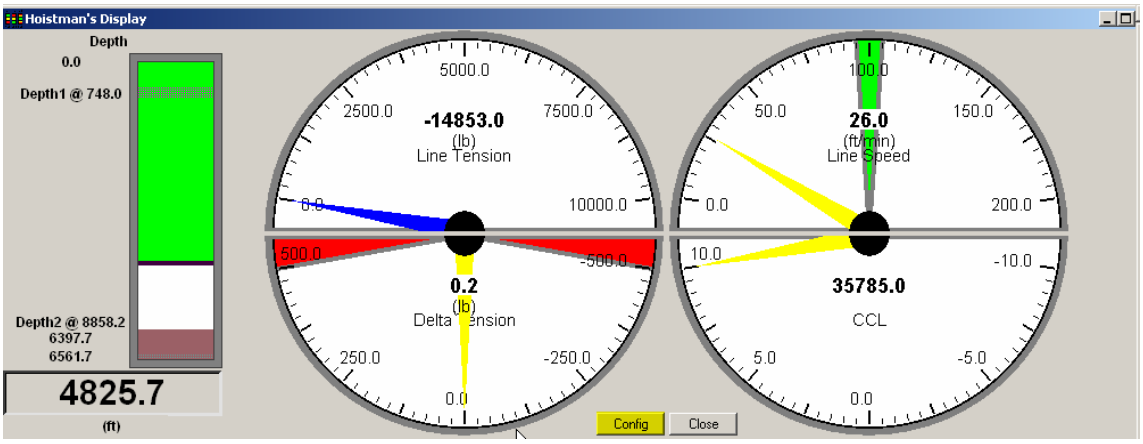


FIG: 4.115 Hoistman's Display

Click **Config**.

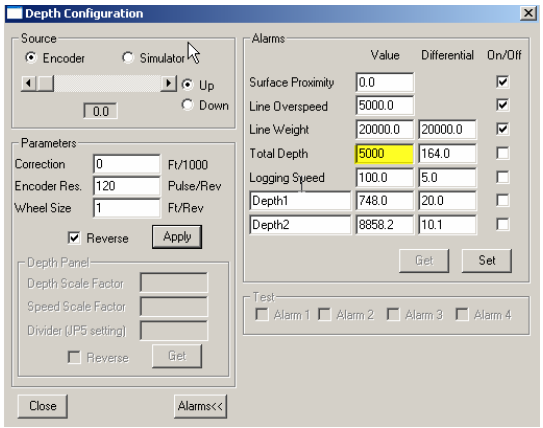


FIG: 4.116 Set up Depth Configuration

Right click over the gauge to select Gauge Properties

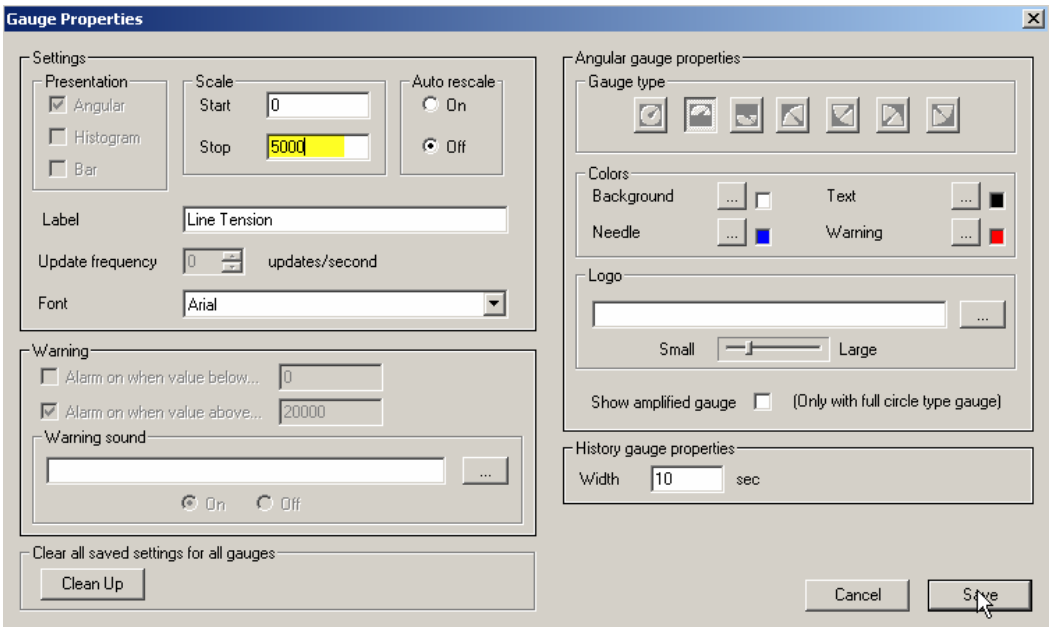


FIG: 4.117 Set Gauge Properties

VIDEO: 4.7 Monitor

Section

5

5 Service Editor

The purpose of the Services Editor is to aid in modifying current services, creating new services, and importing and exporting services from similar types of Warrior systems. To start the Service Editor, go to Warrior Utilities and click on the Edit Logging Service Details.

We suggest that a backup of the Services.ini file be made before any service editing, so that existing service information may be recovered if mistakes are made while editing. Probably the easiest way to do this is to use the Configuration Backup/Restore utility and do a backup.

5.1Edit logging services Details

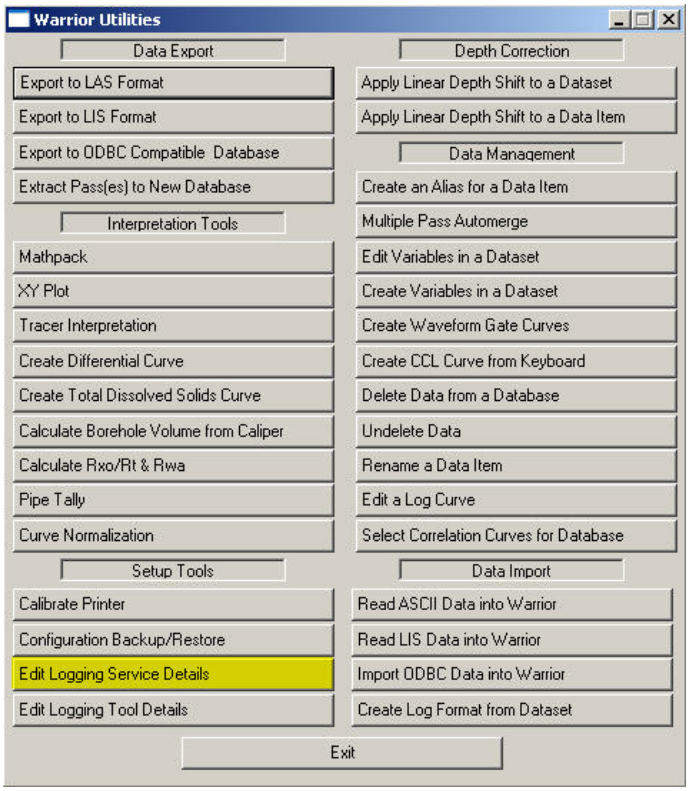


FIG: 5.1 Edit Logging Services Details

When the Service Editor window comes up, on the left side of the window are two service lists, labeled Active and Disabled. The active list of services will be displayed when a service is selected from Warrior Acquisition. The disabled list of services are included in the service.ini file but are not displayed in the acquisition service list. Normally there will be no services in the disabled list.
When an active service is selected by clicking on it in the list, all of the service details are displayed in the Service Details panel on the right side of the window. This information includes the default interactive plot for that service, the selected zero point (encoder depth reference for zero offset) for the service, a service title, if a title other than the service name is desired, and a choice whether the service should always use the master copy of the presentation or open the master and use it for editing as a private copy of the presentation in the database. There are also four lists that are labeled Devices, Controls, Sensors, and Tools. Each list contains specific details about the service.

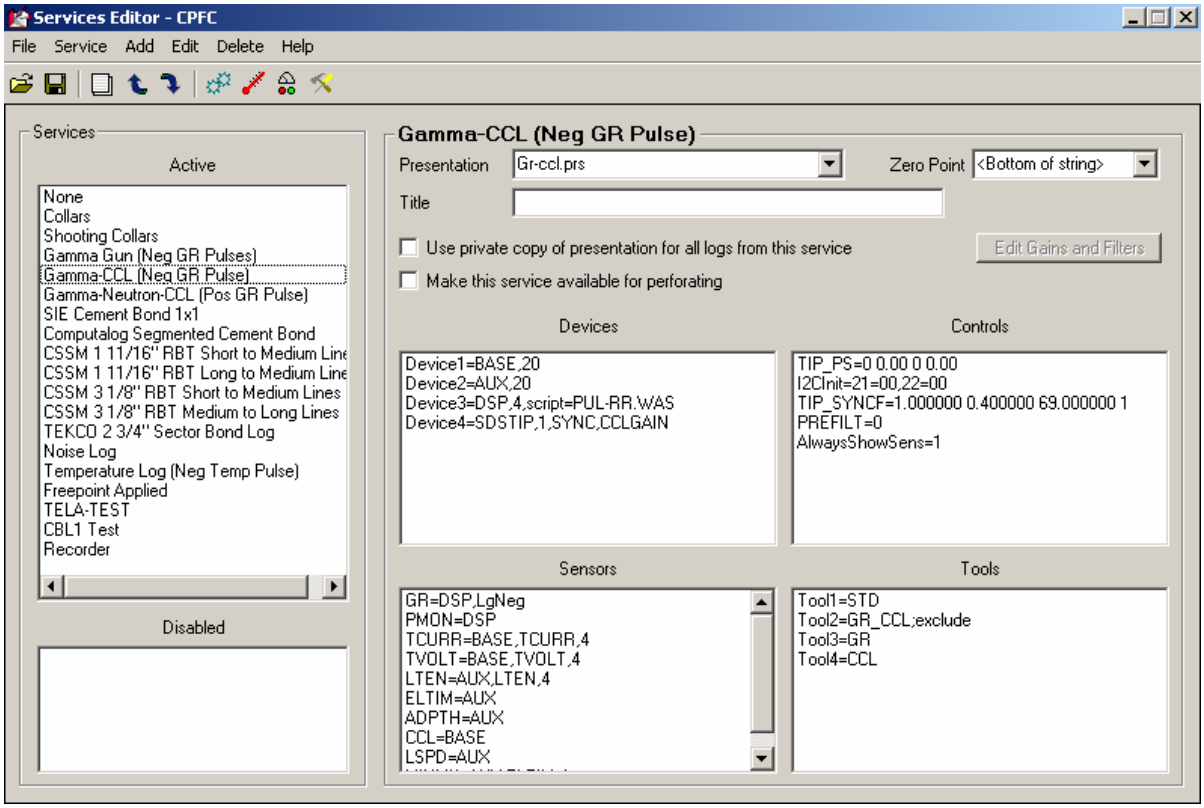


FIG: 5.2 Services Editor

The Tools list contains all of the tool types that are available in the service. If a tool type is not listed in a particular service, than it is not possible to use that tool in that service. Tools may be listed but excluded. (Tools are normally excluded by removing them from the tool string using the tools string editor in Acquisition.) The STD tool type will normally be listed in every service since this includes sensors for depth, tension, line speed, tool voltage and current, etc.
The Devices list contains acquisition devices that the system uses to acquire information. Depending upon the panel type, it may include a DAMU, DAMUPCI, DSP, SDSTIP, ASCTEL, and others. Each device is set with a default sample rate of the maximum number of samples per foot. Some of the devices also require additional information such as the DSP Script file, the type of ASCII telemetry, and what hardware gain controls that the service will provide.
The Controls list contains settings for hardware devices within the interface panel. This includes items such as filter settings for various signal paths, I2C Initialization codes for setting various initial relays states, and software controlled tool voltage setting for that service.
The Sensor list contains the sensors for the tool types that are available. Each sensor definition must have the device that it uses to acquire its information. The definition also should contain a device

channel number or a device channel name. If the device channel name is the same as the sensor, then that name is not required. The definition could also have a sample rate. If the rate is less than the device default sample rate, then the sensor data will be saved at the slower rate. If the rate is greater than the device default rate, then the sensor data will be saved the default rate of the device. If omitted, the sample rate will be at the device default sample rate. The sample rate can only be used if the channel is listed. (Sensor=Device, channel, rate).

5.2 Editing an Existing Service

The Service Editor can be used to modify settings in an existing service. To view the settings for a service, click on the service in the Active service list. The right side of the window will display the service information and settings for that service.
The default presentation for a service can be selected from the Presentation drop down list. The list will include all PRS files that are in the Warrior\Format folder. The interactive plot presentation will display outputs from the sensor information at that are included in the presentation.
If the box labeled Use private copy of presentation for all logs from this service is checked, then when the first pass of the service is started in a database, the default presentation is copied into the database as a private presentation. If any changes are made to the log format presentation, then those changes are made in the private copy of the presentation in the database. The changes are not made to the original presentation that is in the Warrior\Format folder.
If the box is not checked, then the presentation is not copied into the database. Any changes that are made to the presentation from interactive plot are made to the original presentation file. If at a later date in time the file is viewed using interactive plot, then since the presentation is not part of the database, the current copy of the presentation (if it exists on the system) in the Warrior\ Format folder is used to display the presentation. If the presentation is not located in the Format folder, then no presentation will be displayed. Interactive Plot options would have to be used to select a presentation format for display.
The Zero Point drop down list has a list of sensors in the service. Any of the sensors or the bottom of the tool string may be selected as the zero point. The zero point of a tool string has zero offset to the encoder depth reading. Scientific Data recommends that the bottom of the tool string be used as the zero point in most logging services. In perforating services, the CCL is set as the encoder depth. In services that a normally run in a time drive mode at a set depth, such as a Noise Log or Freepoint Log, the particular sensor of interest should be set as the zero point to be able to position the sensor as desired.
In acquisition, when a service has been selected, that service name will normally be displayed. By typing in the Title field of the Service Editor, the service displayed may be different than the service name.

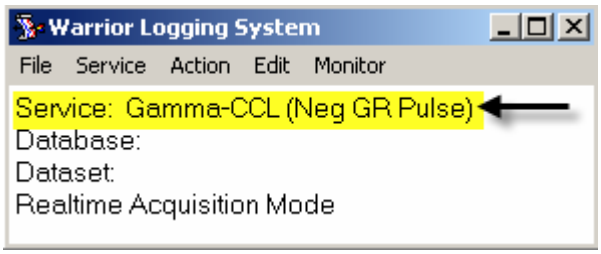


FIG: 5.3 Service

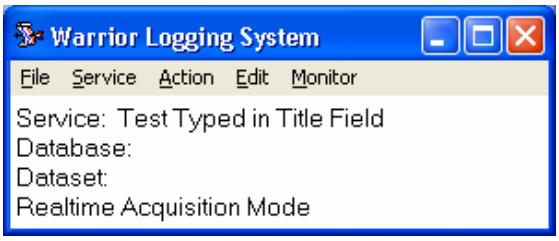


FIG: 5.4 Service different Name

5.3 Adding and Removing Tool Types

Tool types can be added or deleted from a service. To delete a tool type from a service, click on the tool type in the Tools drop down list. Then either push the <Delete> key on the keyboard or on the Services Editor menu bar, click on Delete. A window will come up to confirm that you wish to delete the selected tool type.

Warning! Tool names, Model names, and Serial names can contain a maximum of 39 characters and cannot have any spaces.

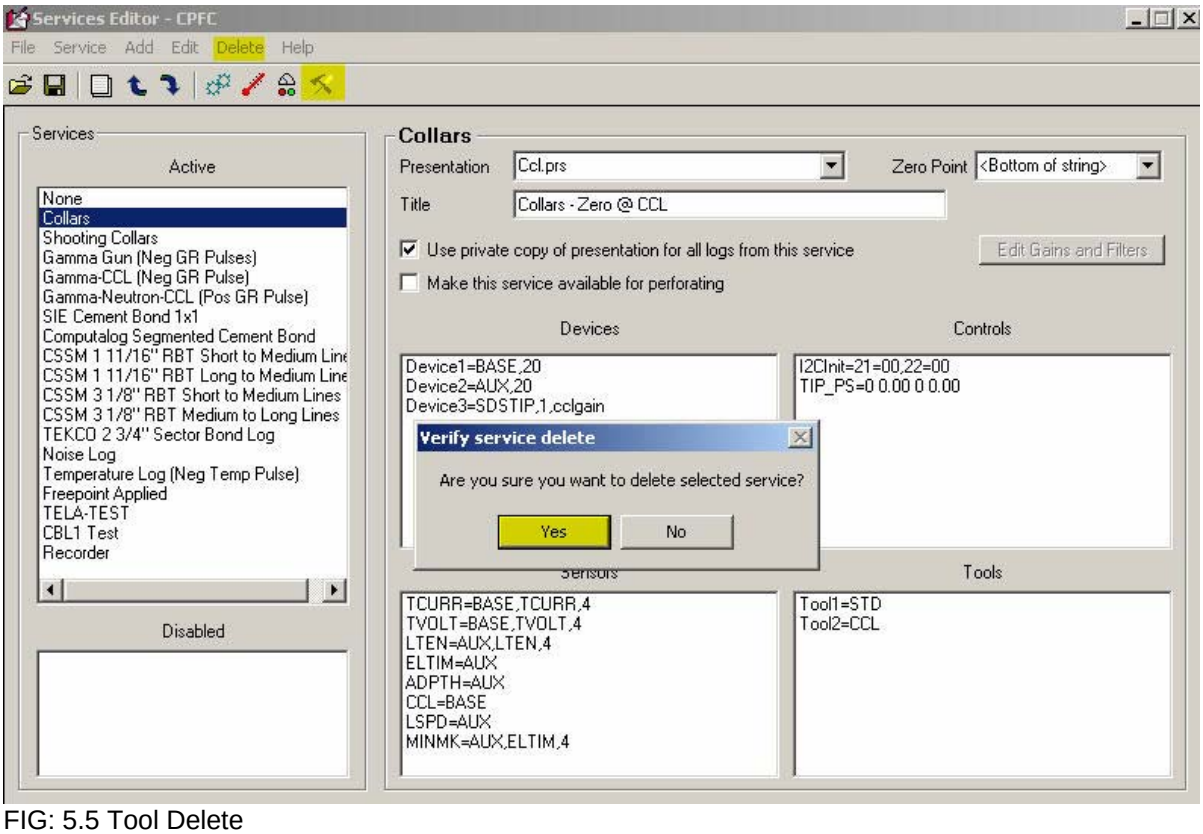


FIG: 5.5 Tool Delete

It is recommended that the sensors that the tool type produced be deleted in a similar manner at the same time, although if the sensors are left in, the service should still work.

To add a tool type to a service, on the Menu Bar click on Add -> Tool. An Add tool dialog box will come up with the next available tool number. Enter the tool type in the dialog box. Only the tool type needs to be entered, a specific serial number for that tool type is not required at this time (i.e. Tool6=GR not Tool6=GR; Serial=1234). When the service is next used, it will call up the first available serial number of that tool type that it can find. It is necessary for the tool type to exist in the tools.ini file. If the tool type does not exist, then when the service is called up from acquisition, you will get an error message and it will not work.

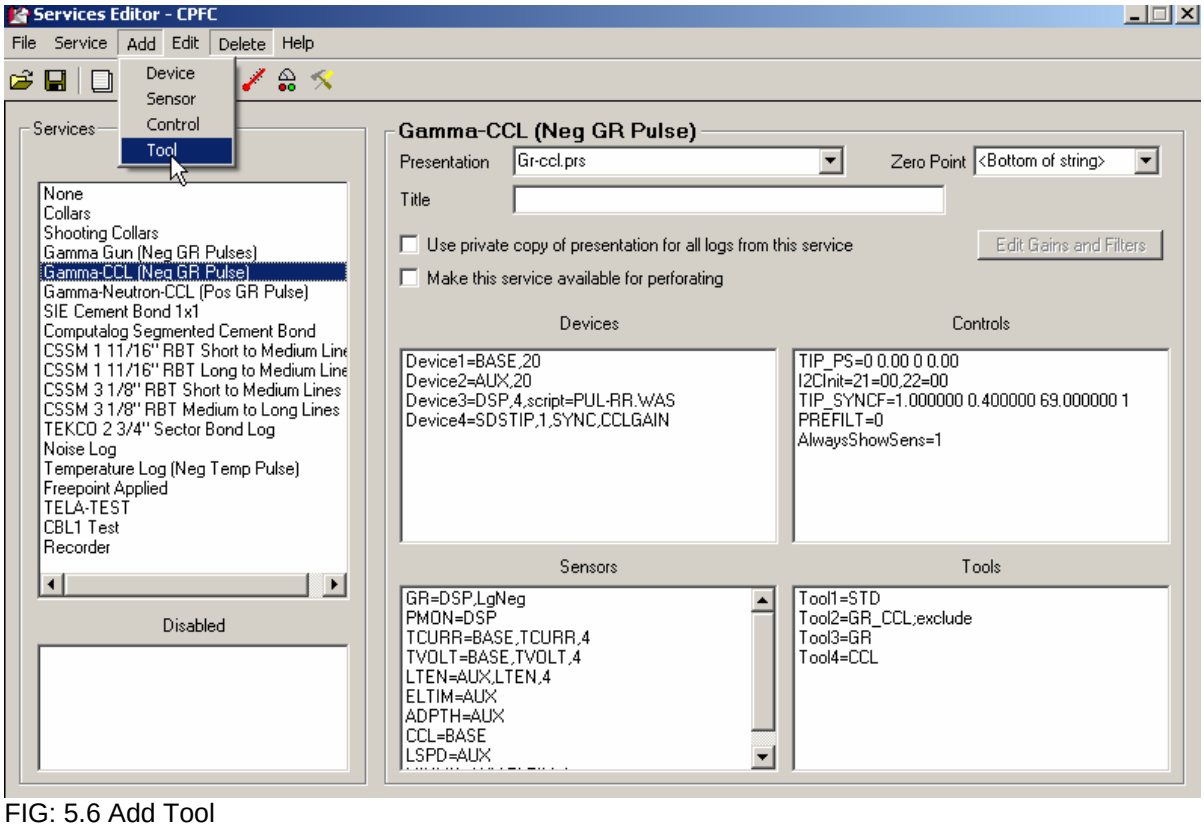


FIG: 5.6 Add Tool

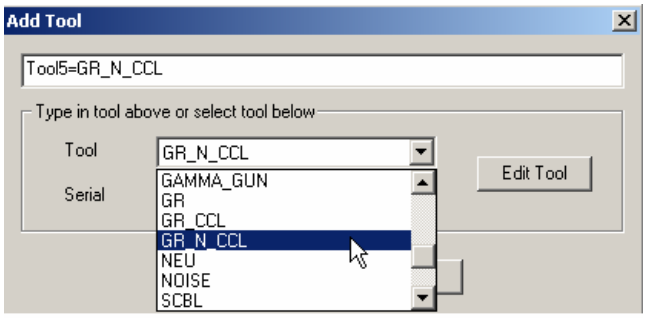


FIG: 5.7 Edit Tool

When a tool is added to a service, sensor(s) will normally have to be added also. The software modules that the tool type uses will have specific sensors, as shown in the Tool Editor. Each of these

sensors will have to be added to the service or when the service is called up from acquisition you will get an error message and the service will not work.
To add a sensor to a service, click on **Add -> Sensor** on the Service Editor menu bar. The Add Sensor dialog window will come up. Enter the sensor mnemonic, followed by an equals sign "=", then the Device that the sensor acquires data from, then the channel of that device, and the sample rate for storing the sensor data (Sensor=Device,Channel,Rate). The Device must be listed in the Devices drop down list. The device and channel that a sensor will use is hardware dependent, and in the case of the DSP also script dependent. It is beyond the scope of this document to explain further. For more help contact Scientific Data Systems, Inc.

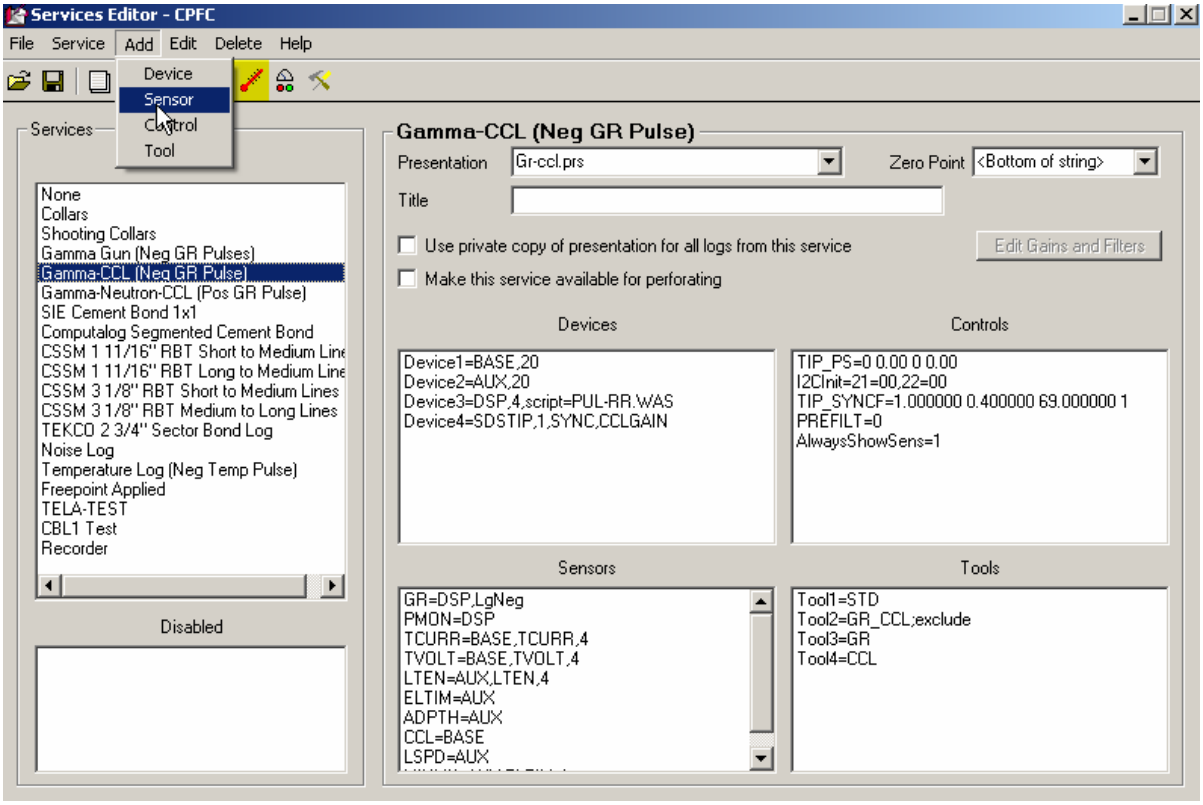


FIG: 5.8 Add Sensor

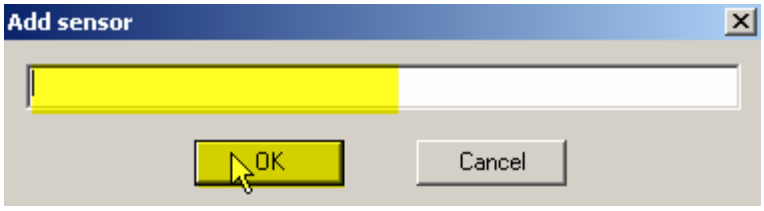


FIG: 5.9 Type New sensor

Devices and Controls may be added and removed in a similar manner. Again they are hardware dependent and beyond the scope of this document. For more information contact Scientific Data Systems, Inc.

Any line in the Devices, Controls, Sensors, and Tools list may be edited. To edit a line, click on the desired line, then on the menu bar click **Edit**. Double clicking on a line will also invoke the edit command.

5.4 Add Surface Sensors

ADD Wellhead Pressure Sensor on AUX4

Select Utilities

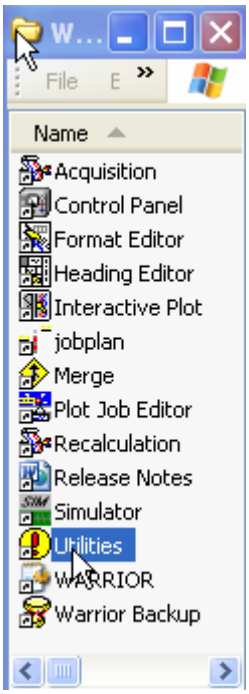


FIG: 5.10 Utilities

Select Edit Logging tools Details

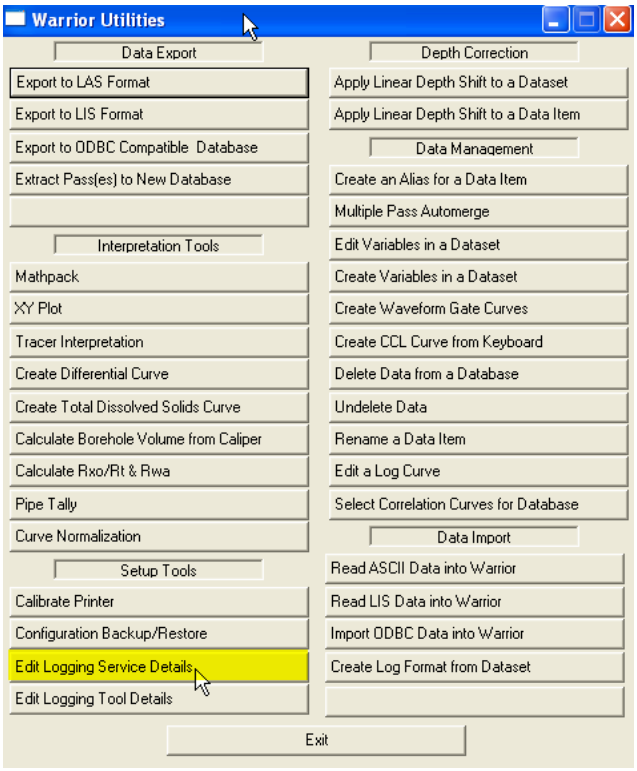


FIG: 5.11 EDIT Logging services Details

Select the service to add the new WHP sensor

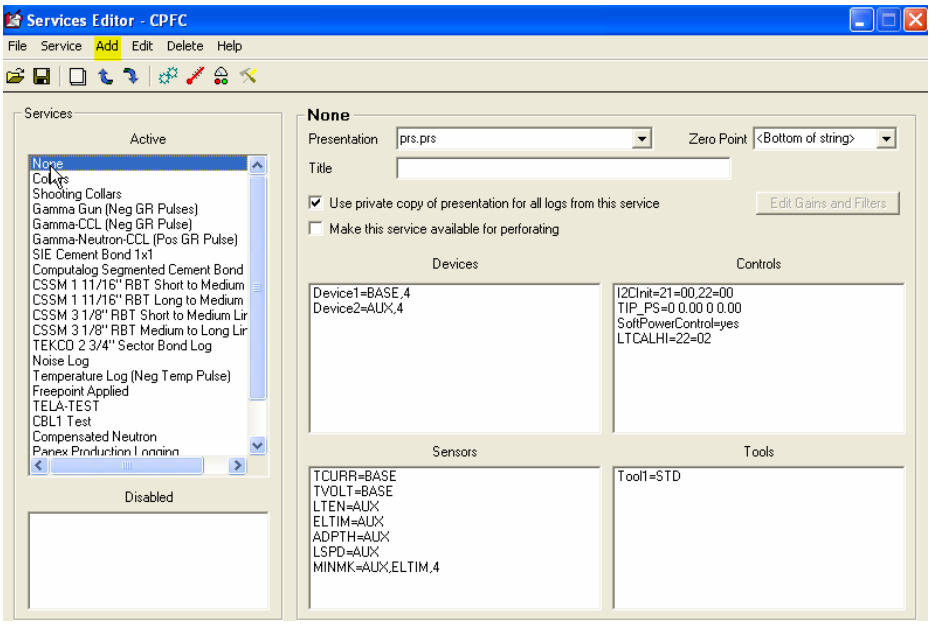


FIG: 5.12 Select the Service

Add new Sensor

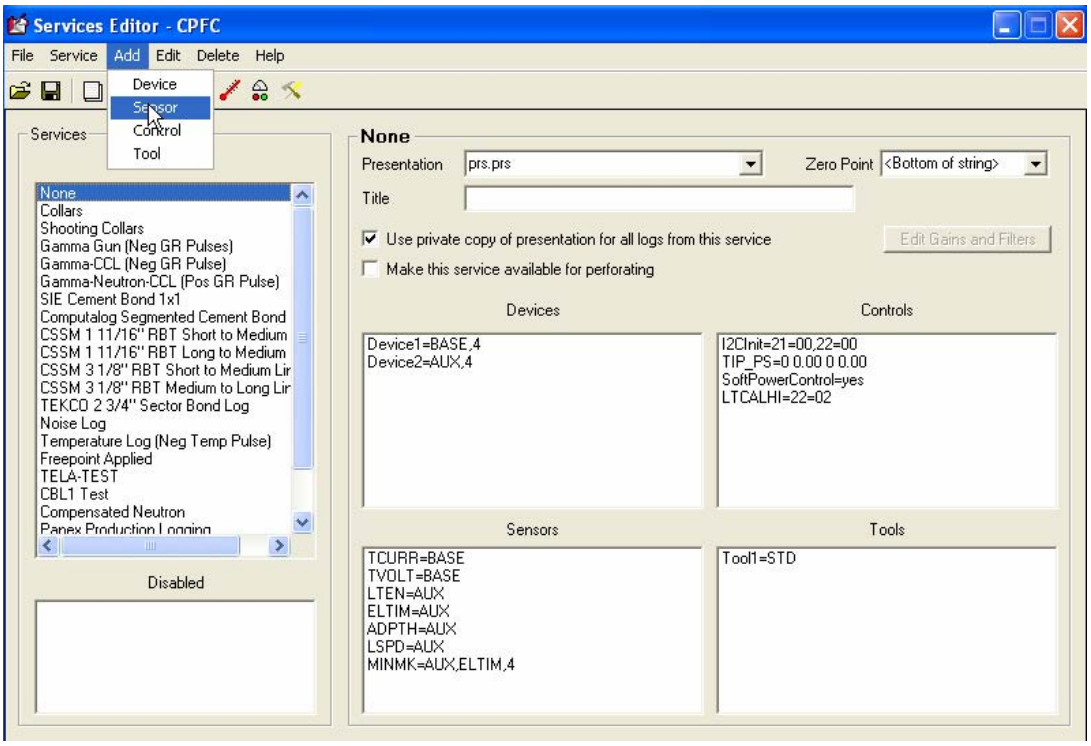


FIG: 5.13 Sensors

Type WHP1 = BASE, 11

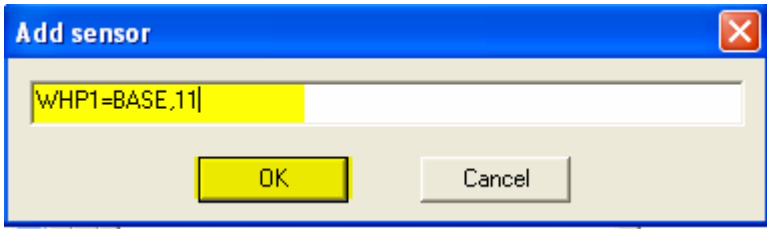


FIG: 5.14 Add sensors

Select **OK** and Save the service

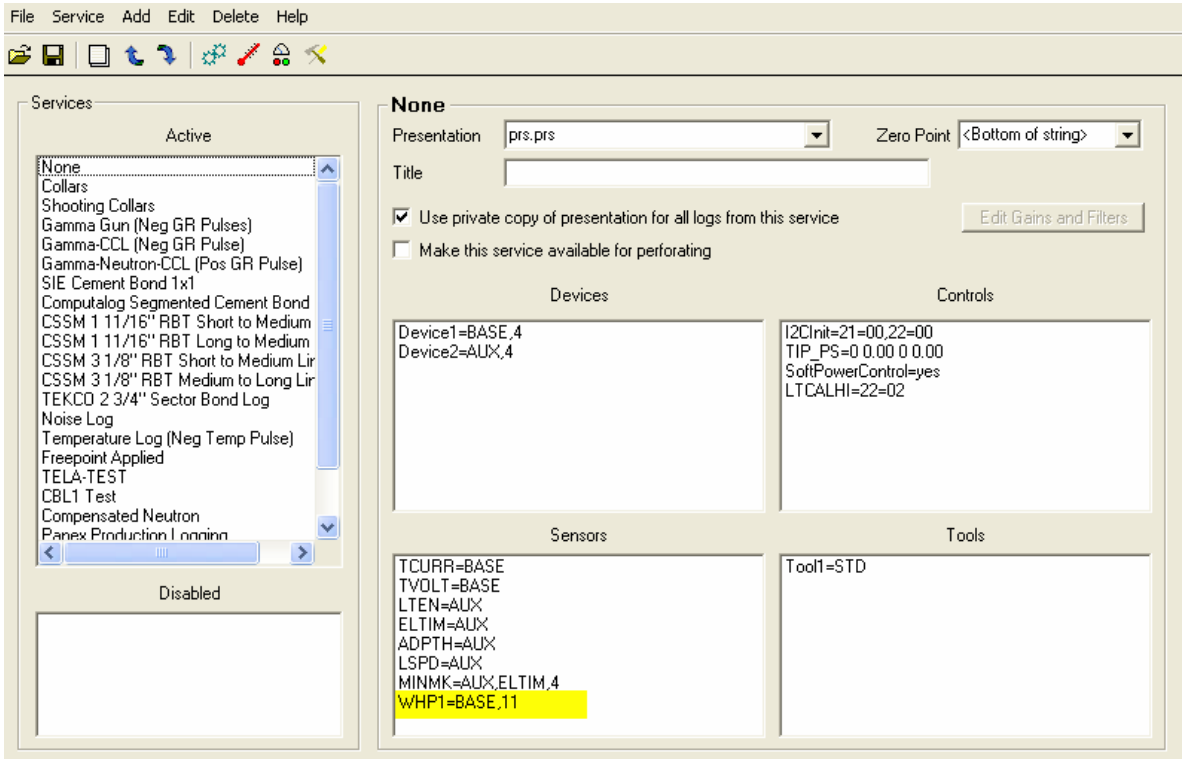


FIG: 5.15 Set sensors

Open the service

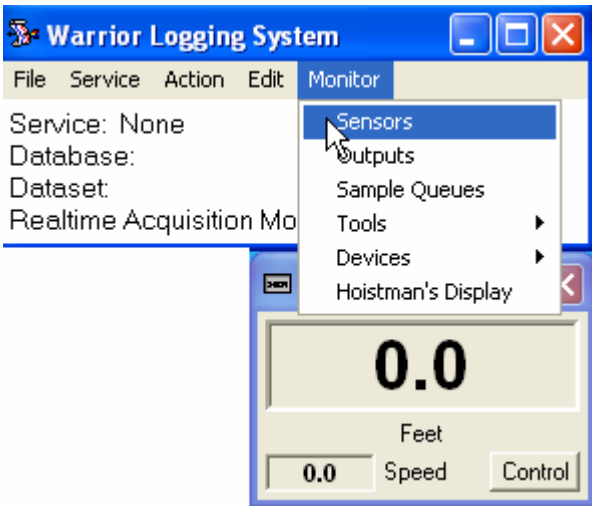
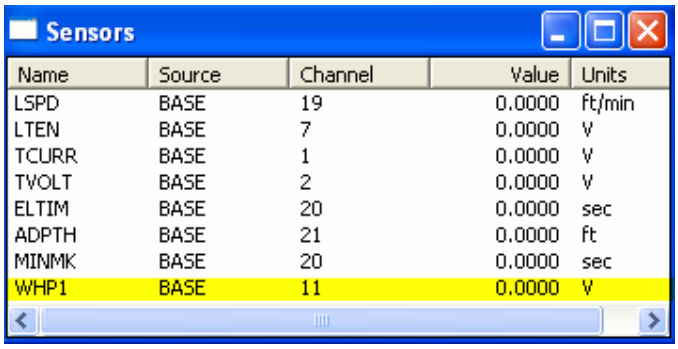


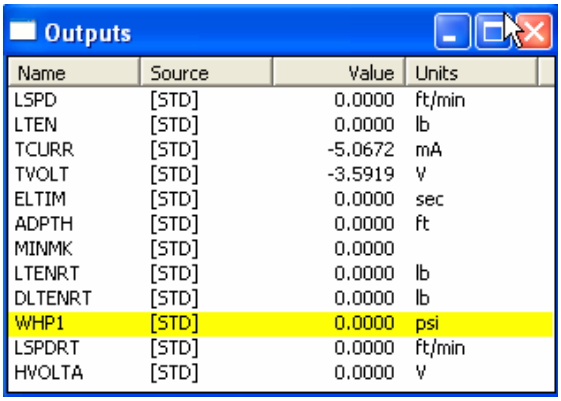
FIG: 5.16 Monitor sensors
Select Monitor/Sensors



Name	Source	Channel	Value	Units
LSPD	BASE	19	0.0000	ft/min
LTEN	BASE	7	0.0000	V
TCURR	BASE	1	0.0000	V
TVOLT	BASE	2	0.0000	V
ELTIM	BASE	20	0.0000	sec
ADPTH	BASE	21	0.0000	ft
MINMK	BASE	20	0.0000	sec
WHP1	BASE	11	0.0000	V

FIG: 5.17 Sensors Value
Sensor Value in Volts

Select Monitor/Outputs



Name	Source	Value	Units
LSPD	[STD]	0.0000	ft/min
LTEN	[STD]	0.0000	lb
TCURR	[STD]	-5.0672	mA
TVOLT	[STD]	-3.5919	V
ELTIM	[STD]	0.0000	sec
ADPTH	[STD]	0.0000	ft
MINMK	[STD]	0.0000	
LTENRT	[STD]	0.0000	lb
DLTENRT	[STD]	0.0000	lb
WHP1	[STD]	0.0000	psi
LSPDRT	[STD]	0.0000	ft/min
HVOLTA	[STD]	0.0000	V

FIG: 5.18 Output Value

WHP1 (psi.)

Select Action/Calibration Wellhead Pressure 1

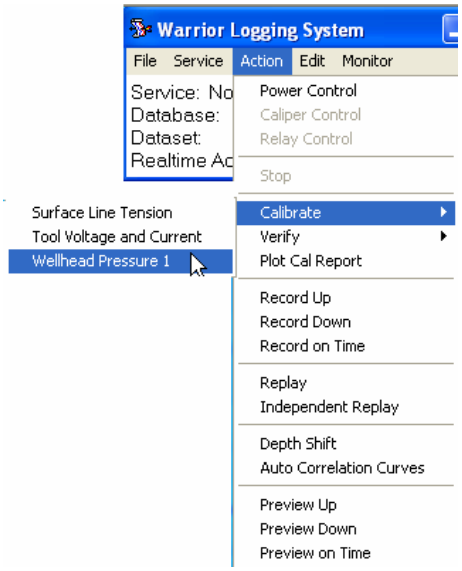


FIG: 5.19 Action/Calibrate

Set the low and high value to calibrate the WHP1 Sensor.

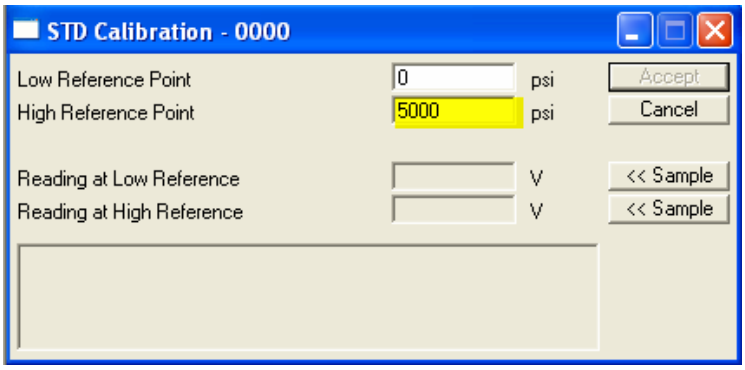


FIG: 5.20 Set Calibrations Points

On side DB25 Add 250 Ohms

AUX4 - Auxiliary Inputs	DB25 Pin OUT	USB44	SOFTWARE CHANNEL
4-20 mA	AUX4-2	CC13-2	BASE,15
4-20 mA	AUX4-3	CC13-3	BASE,14
4-20 mA	AUX4-4	CC13-4	BASE,13
4-20 mA	AUX4-5	CC13-5	BASE,12
4-20 mA	AUX4-6	CC13-6	BASE,11
Frequency	AUX4-9	CC13-34	CTR3
Frequency	AUX4-10	CC13-35	CTR2
	AUX4-21	CC1-19	+5V
	AUX4-22	CC1-20	GND
	AUX4-23	CC1-21	-15V
	AUX4-24	CC1-22	+15V

Add Resistors (250 ohms) to convert the current loop 4-20mA to Voltage 1 -5 volts

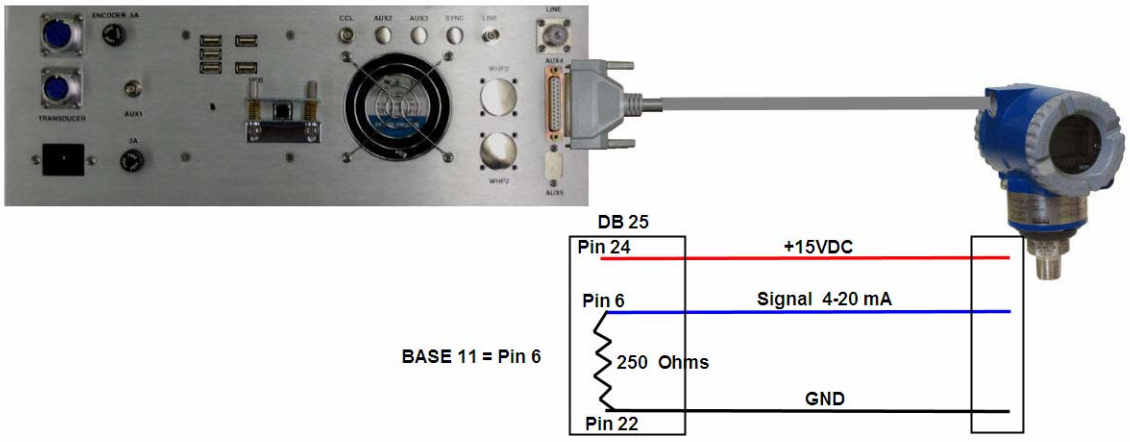


FIG: 5.21 AUX 4 Hardware Connections

WPH1 and WPH2 Connectors for ASW-Board version 11 or latest

CONNECTORS INPUTS	ANSW	SOFTWARE CHANNEL	SIGNALS
WHP1-A	CC7-11	BASE,9	-(4-20MA) Input Negative
WHP1-B	CC7-10		+(4-20MA) Input Positive
WHP1-C			
WHP1-D	CC7-8		WHP1 +15V Excitation
WHP1-E	CC7-20		Ground
WHP2-A	CC7-14	BASE,10	-(4-20MA) Input Negative
WHP2-B	CC7-13		+(4-20MA) Input Positive
WHP2-C			
WHP2-D	CC7-18		WHP2 +15V Excitation
WHP2-E	CC7-42		Ground

5.5 Modifying the Service List

The Service Editor can be used to modify the appearance of the service list in a variety of ways. Services can be renamed, have where they appear in the list changed, be temporarily disabled so that the do not appear as a selection in **Acquisition**, or can be completely removed from the services.ini file.

To change the name of a Service in the active service list, click on the service. (Only services that are in the active service list can be renamed.) Then on the menu bar, click on **Service -> Rename.** A dialog box will come up with a place to type in the new name for the service. When the **OK** button is pressed, the service name will be changed.

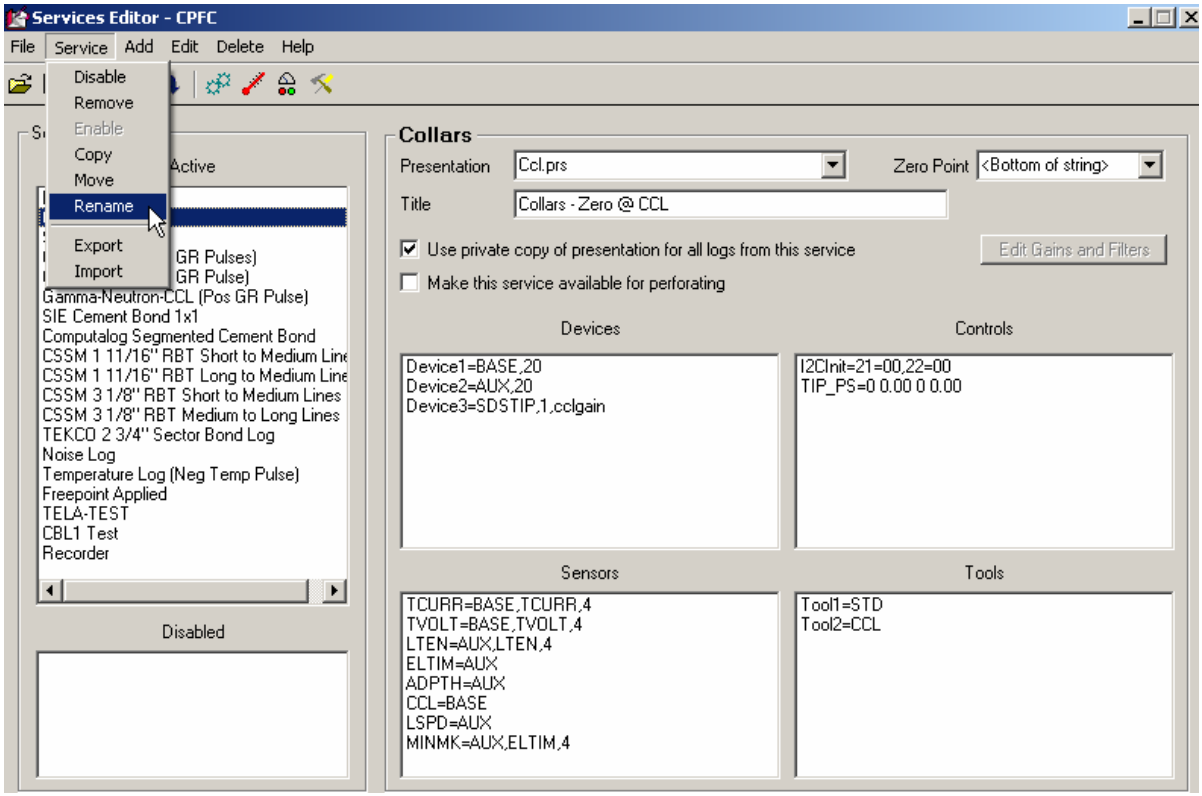


FIG: 5.22 Rename

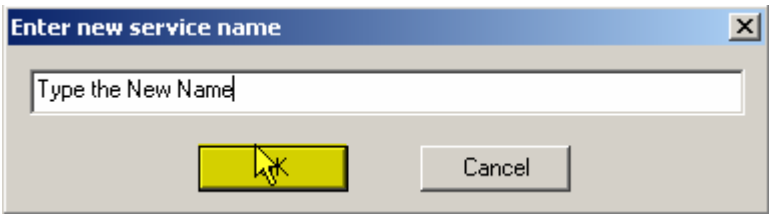


FIG: 5.23 Enter new Service Name

Moving a service can change the order of the services in the active service list. To move a service, click on the service in the list. Then on the menu bar, click on **Service -> Move.** A dialog box will ask you to choose a location in the current list to move the service to. The service will then be moved to the selected location in the list with other services between the original location and the new location moving up or down in the list as needed.

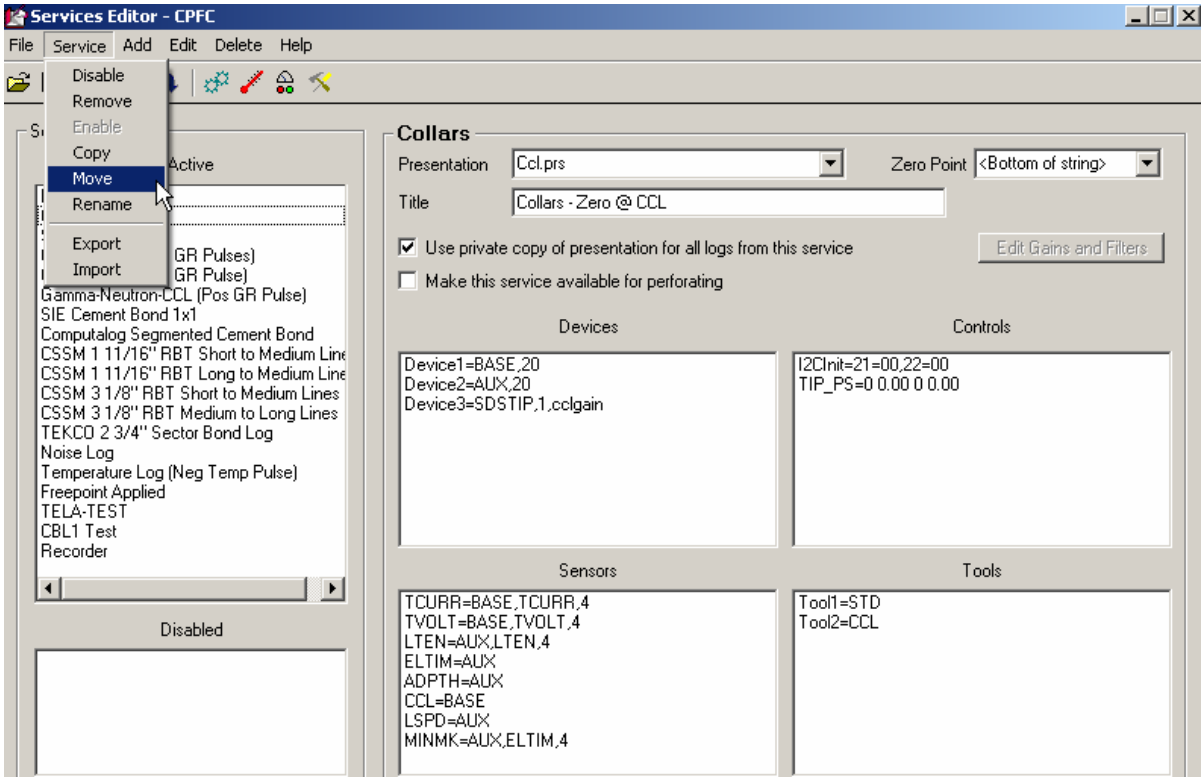


FIG: 5.24 Move Service

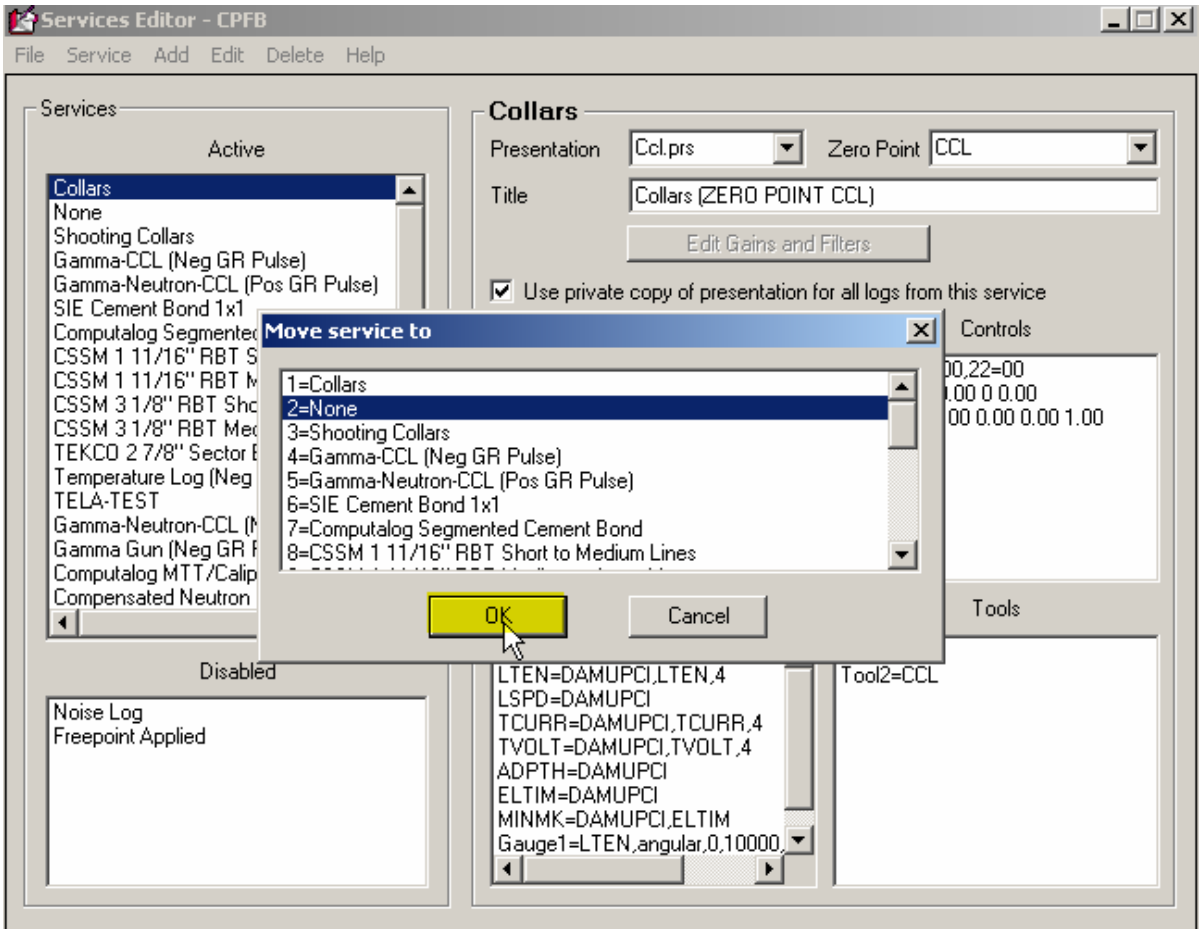


FIG: 5.25 Move service to

A service can be disabled so that it does not appear in the Acquisition service selection list. It will remain in the services.ini file so that it can be reactivated or enabled at some later date. To disable a service, click on the service in the Active list. Then on the menu bar, click on **Service -> Disable**. The service will immediately be moved to the disabled list. Any service that is in the Disabled list can be put back into the Active list. Click on the service in the Disabled list. Then on the menu bar, click on **Service -> Enable**. The service will immediately be moved from the Disabled service list to the bottom of the Active service list.
A service from either the Active service list or the Disabled service list may be removed. Once removed it will no longer be available. When the service has been selected and **Service -> Remove** clicked on from the menu bar, a confirmation window will come up. If you click **No,** the removal process will be terminated. If you click **Yes**, the service will be removed from the list.

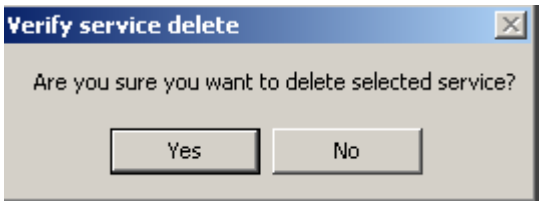


FIG: 5.26 Service Delete

5.6 Adding Services

The two most common ways to add new services are to copy an existing service that you have or to import a service from an exported service list or a different services.ini file. Copying a service is normally used if you have an existing service that works, but you need an additional service that is very similar, such as having a Gamma Ray service that detects positive pulses and needing a Gamma Ray service that detects negative pulses. Importing a service is normally used to add a service that has tool types that the present service list does not support.

5.6.1 Copying a Service

To copy an existing service, click on the service that you wish to copy that is in the active service list. Then on the menu bar, click on **Service -> Copy.** A dialog box will come up requesting you to enter a name for the new service that you are about to create. The name cannot be the same as any name that currently appears in either the existing active or disabled service list. When you click on the **OK** button, the new service will be added to the bottom of the active service list. Be aware that the service information that is displayed on the right side of the Service Editor window is the information for the original service that was selected. If changes are to be made to the new service that was created, you must first click on that service in the active service list.

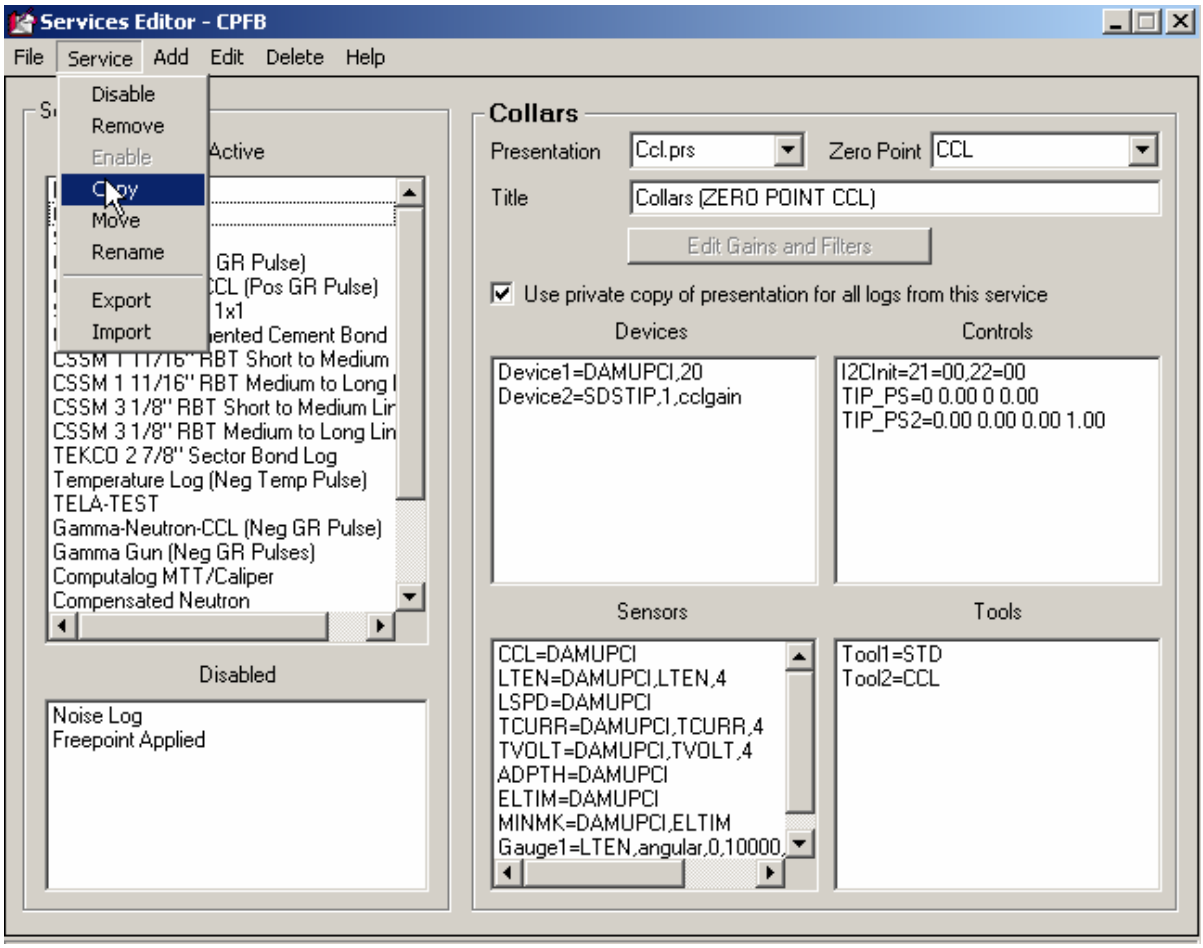


FIG: 5.27 Copy service

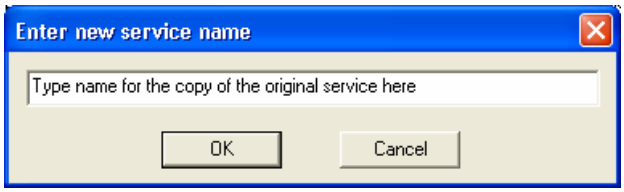


FIG: 5.28 Type new Service name

5.7 Importing Services

Services can be imported from a variety of sources. They can come from the Warrior cased hole (CH USB 70.WSV) service list or from services that have been exported from other warrior systems. With a little effort, they can be imported from service.ini files. Be aware that for an imported service to work, the tool types that the service calls out must exist in the tools.ini file. The Tool Editor can be used for restoring calibrations for tool types to the tools.ini file.

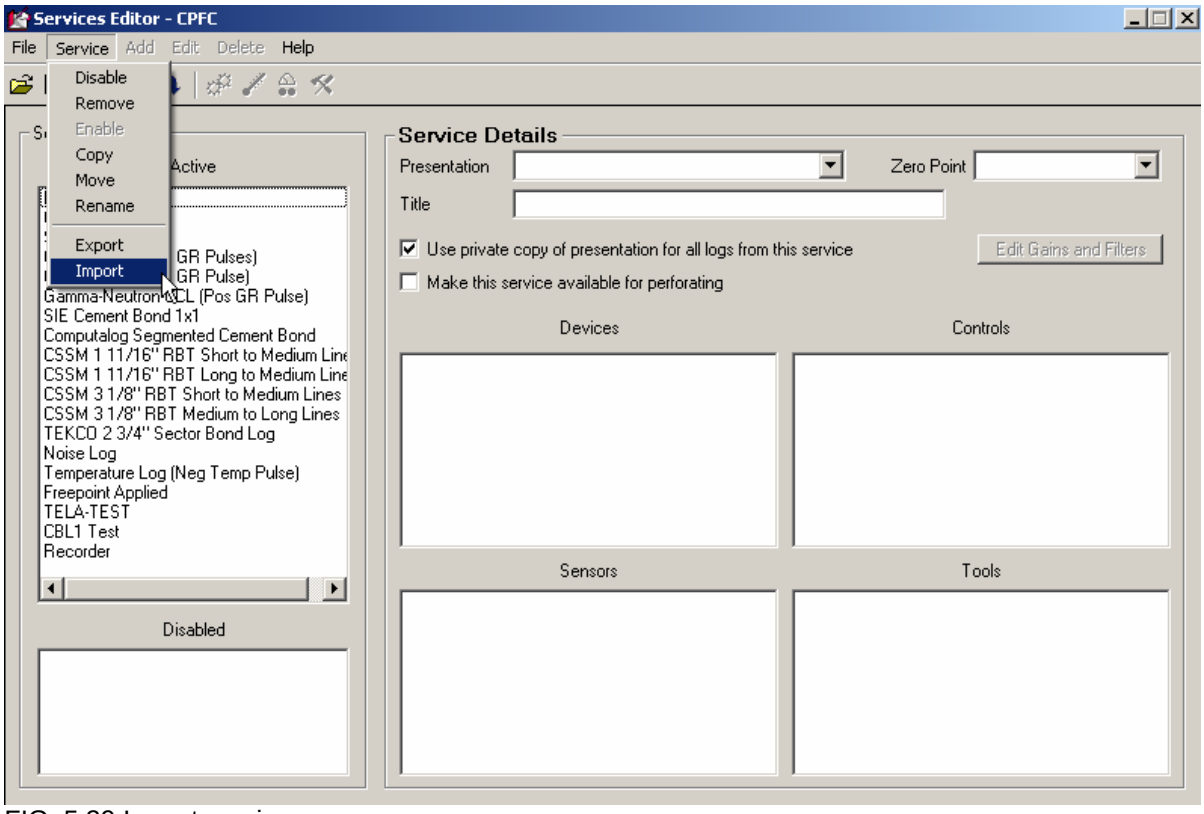


FIG: 5.29 Import service

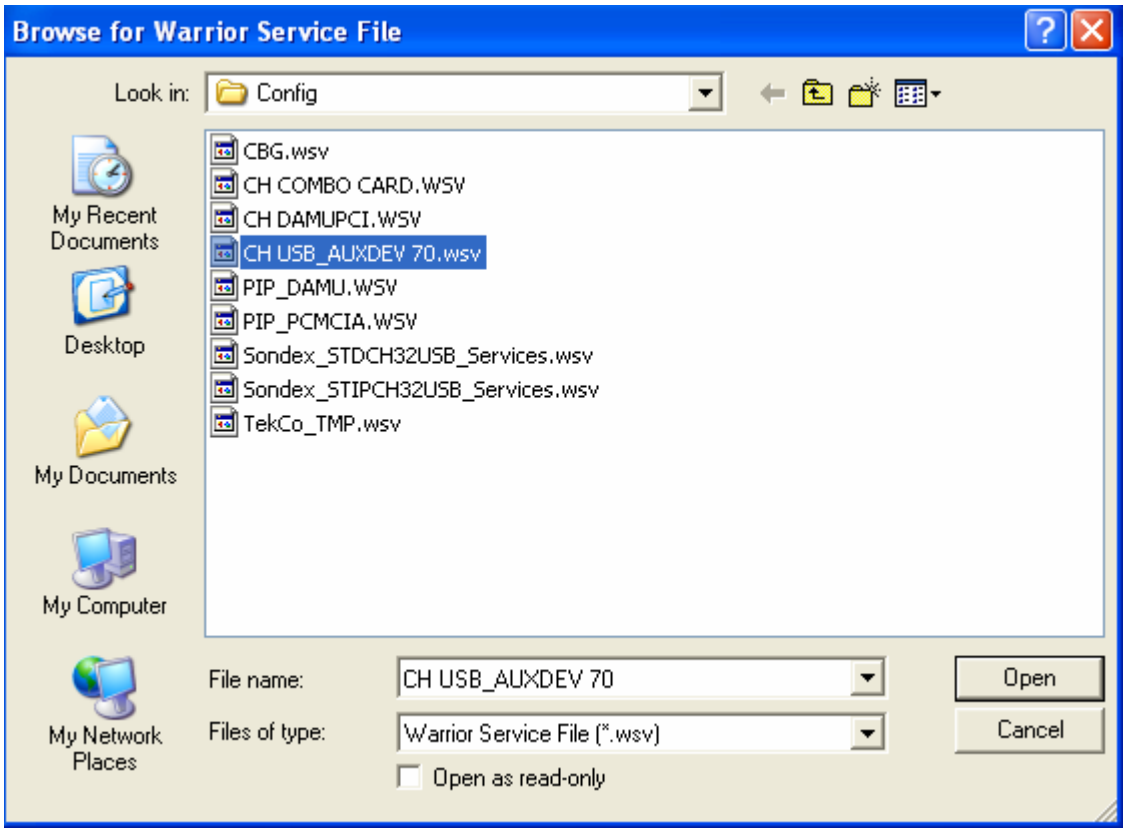


FIG: 5.30 Select warrior service file

To import a service, on the menu bar, click on **Service -> Import.** A browse window will come up looking for a WSV file in the Warrior\Config folder. If you select the **CH USB 70.WSV** file, it contains nearly 90 logging and utility test services that support most types of cased hole equipment. Click on one or more of the services that are listed. Each of the services chosen will be added to the bottom of the active service list.
Services that have been exported from the service editor are normally saved with the **WSV** extension but have been given a file name at the time they are exported. These files may be read in the same manner. You may have to use the look in drop down list to locate the correct drive (and folder) to read them.
Services from files other that **WSV** files may be imported. Use the look in drop down list to change to the drive and folder that the file is located in. then type the complete name of the file in the file name box. If it is a valid warrior service type file, a list of the services that are available will come up as before.

5.8 Exporting Service

The purpose of exporting a service or multiple services is so that they can be imported and used on a similar system that uses the same type of devices. To export a service, on the menu bar, click on **Service -> Export**. A list of the existing active services is then brought up. Click on one or more services in the list and each will become highlighted. When the **OK** button is clicked, a **Browse** for Warrior Service File window will come up. Enter a file name in the file name box. When the **Save** button is clicked, the file will be saved in the folder indicated in the Save in: drop down list.

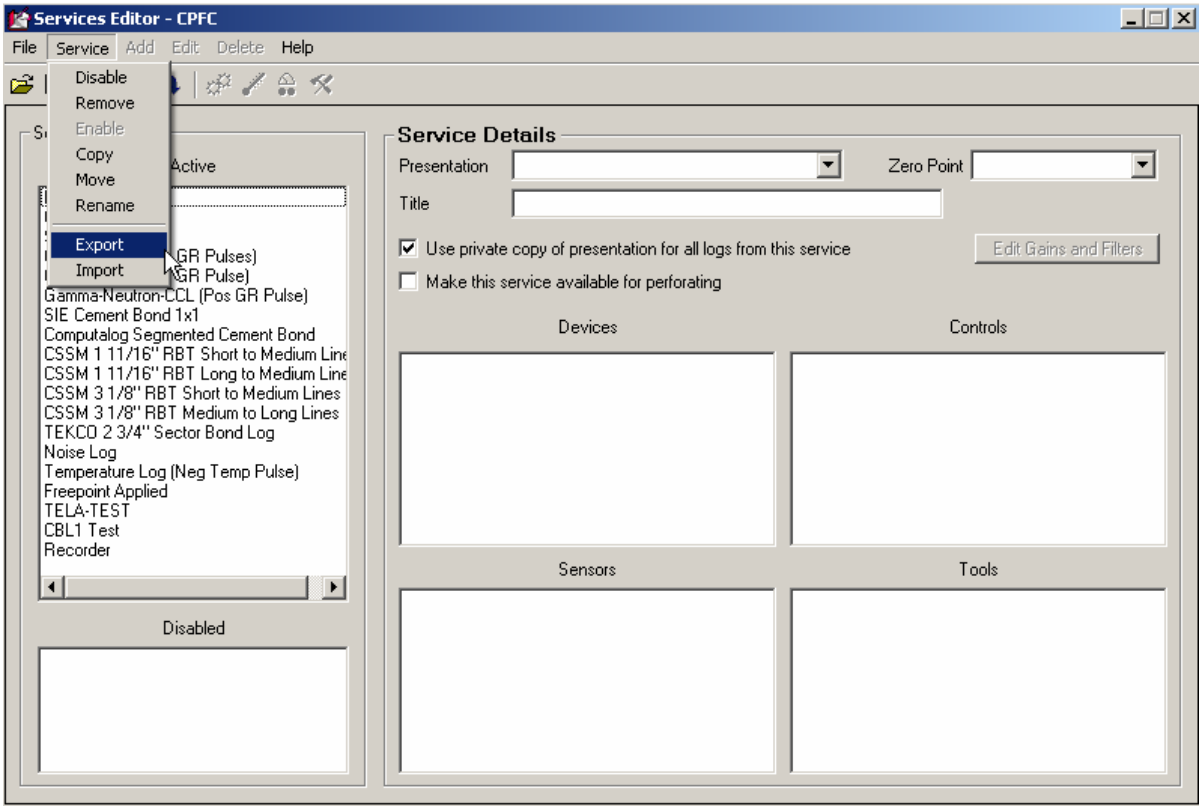


FIG: 5.31 Export

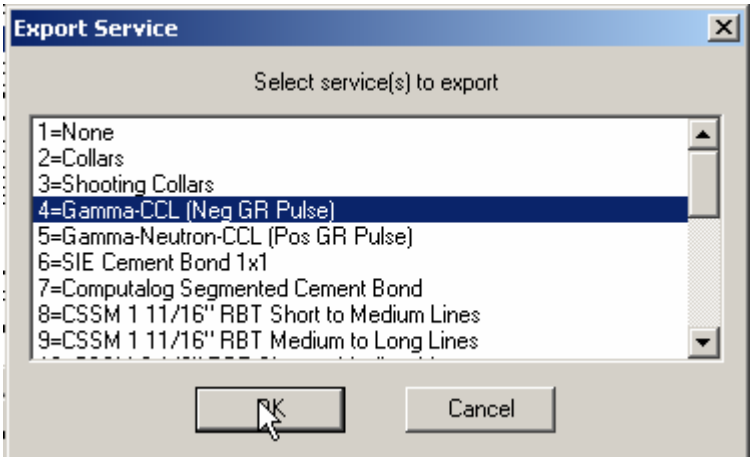


FIG: 5.32 Export service

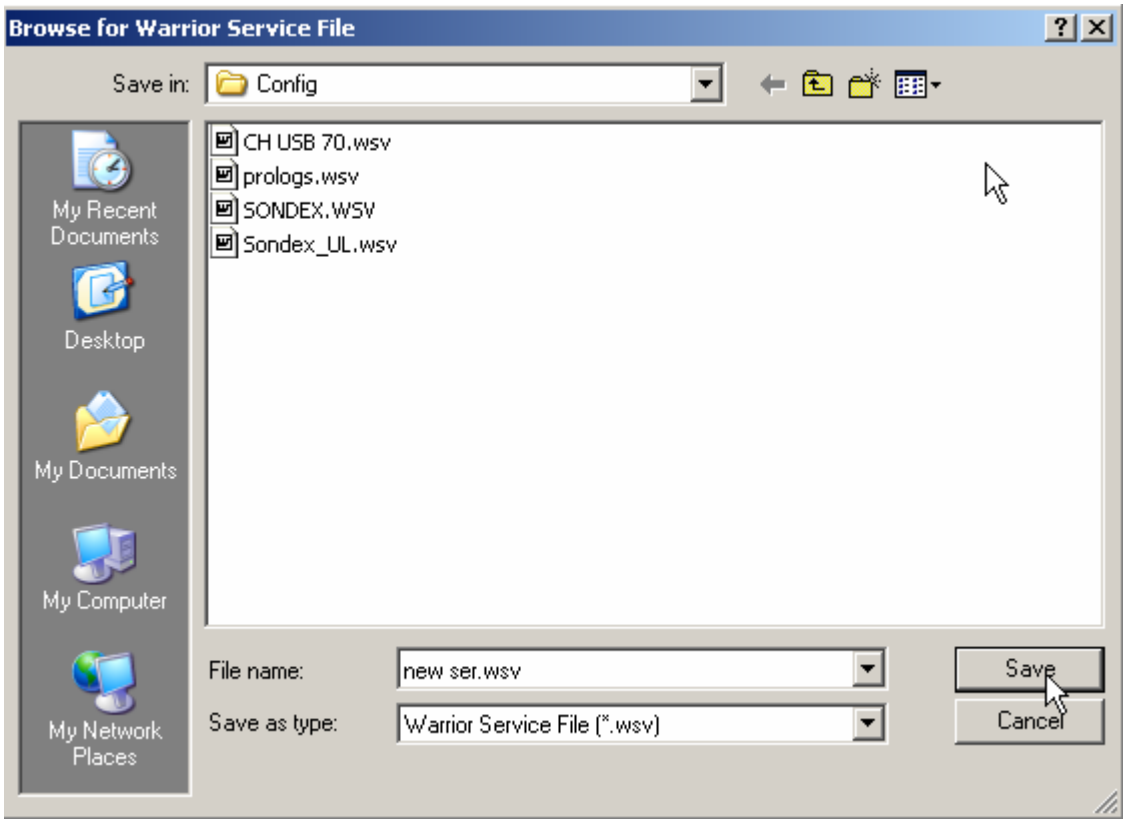


FIG: 5.33 Save new service

Section

6

6 Tools Editor

When tools are ran in a service (by editing the tool string for a particular service), they are chosen by type and serial number. Each serial number is assigned to a specific tool model. Each model of tool has the information that the Warrior System Software uses to process the data that it receives. This includes such general information as type of software, sensor offsets, sensor filtering, and tool length (which effects the offsets of other sensors in the tool string).
By using the tool editor, the pertinent information for each model can be easily changed, new serial numbers created, and new models created. The Tool Editor can be accessed from the Utilities Program in the Warrior Software Group Menu.

We suggest that a backup of the tools.ini file be made before any editing is done so that information may be recovered if mistakes are made.
Tool names, Model names, and Serial names can contain a maximum of 39 characters and cannot have any spaces.

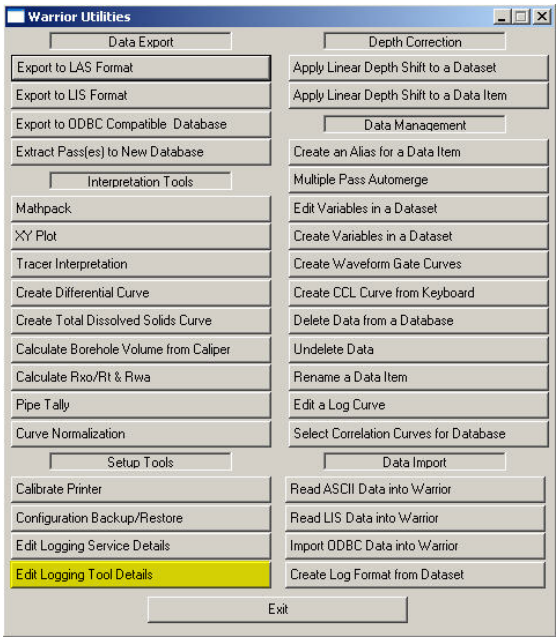


FIG: 6.1 Select edit logging Tool Details

6.1 Editing an Existing Model or Serial Number

To edit the information for a particular tool, click the **+** beside the Tools icon. This will show all of the different types of tools that are currently available. Click on the **+** beside the type of tool that you want to edit. This will show all of the serial numbers that are available for that tool type. Next click either a Serial Number shown or click on the Model drop down list and choose a model type. Any information that is changed will be changed for all serial numbers that are of that model type.
The measuring Units used for all dimensions, sensor offsets, and filters can be selected to be entered as either English (In, Lbs.) or Metric (Cm, Kg).
The Change Tool button can be used to convert a tool to a non-serialized item such as a centralizer or weight bar. Extreme caution should be used with this button. This is to be used to convert files from older versions of Warrior, to Warrior version 7.0. If a tool is converted to a tool with no serial number, the software type and all sensor information is removed.
Tool information is entered by selecting the Model, Software, and Diagram tabs at the top of the window. Each tabbed sheet will contain specific information about the tool model.

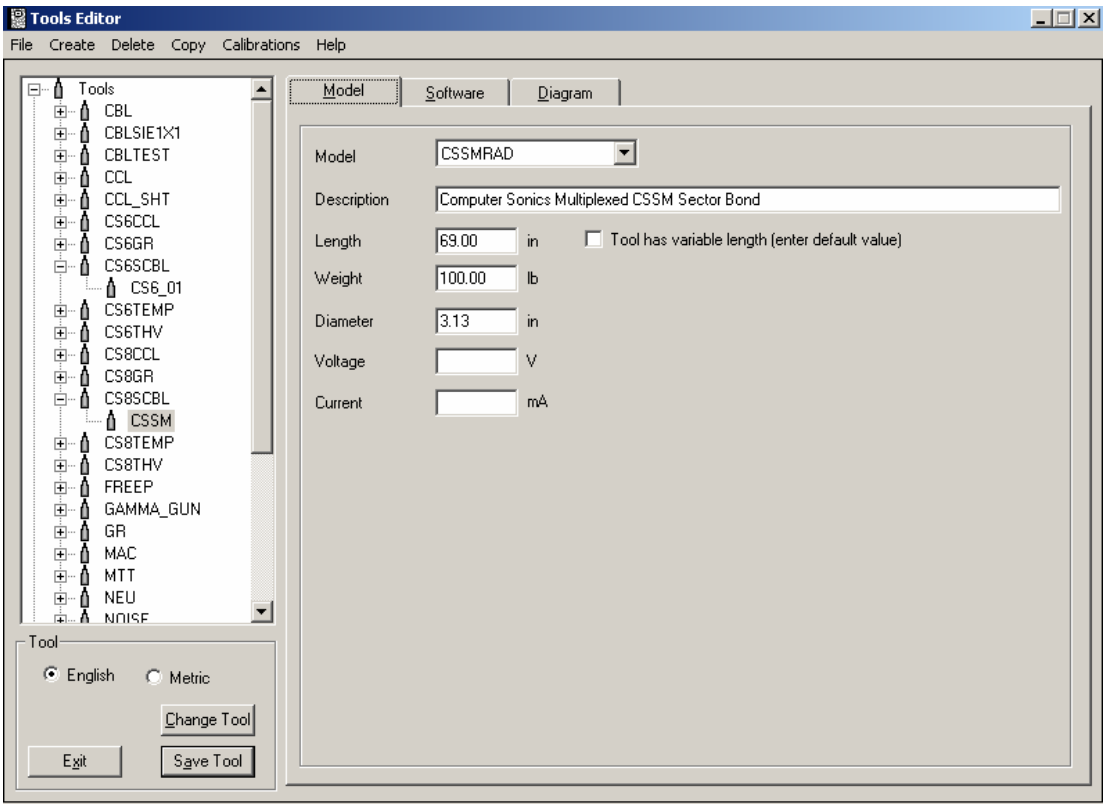


FIG: 6.2 Tools Editor

Under Model Specific information, a brief description of the model can be given (This description will appear in the tool string diagram and in some calibration reports). The Length of the tool should be measured from tool joint to tool joint. This should be an accurate measurement in that it can effect sensor measurements for other tools in the string. The Diameter of the tool can affect services that do flowrate calculations. The combined string length, string weight, and maximum tool diameter will be presented on any tool string diagrams that are printed. Voltage and Current entries are not used

by the Warrior software at this time, but can be used as a reference for the user. A check box is supplied for tools that may have a variable length that can be set at run time such as guns or sinker bars.
The Software modules to be used for logging can also be selected. The selection of the software modules will determine what sensors and filtered outputs will be available for that model of tool. Other model specific parameters may be available depending on the software modules selected. The Warrior 7.0 Software now provides for selection of multiple software modules in the same tool model although the sensors for each module are configured separately.

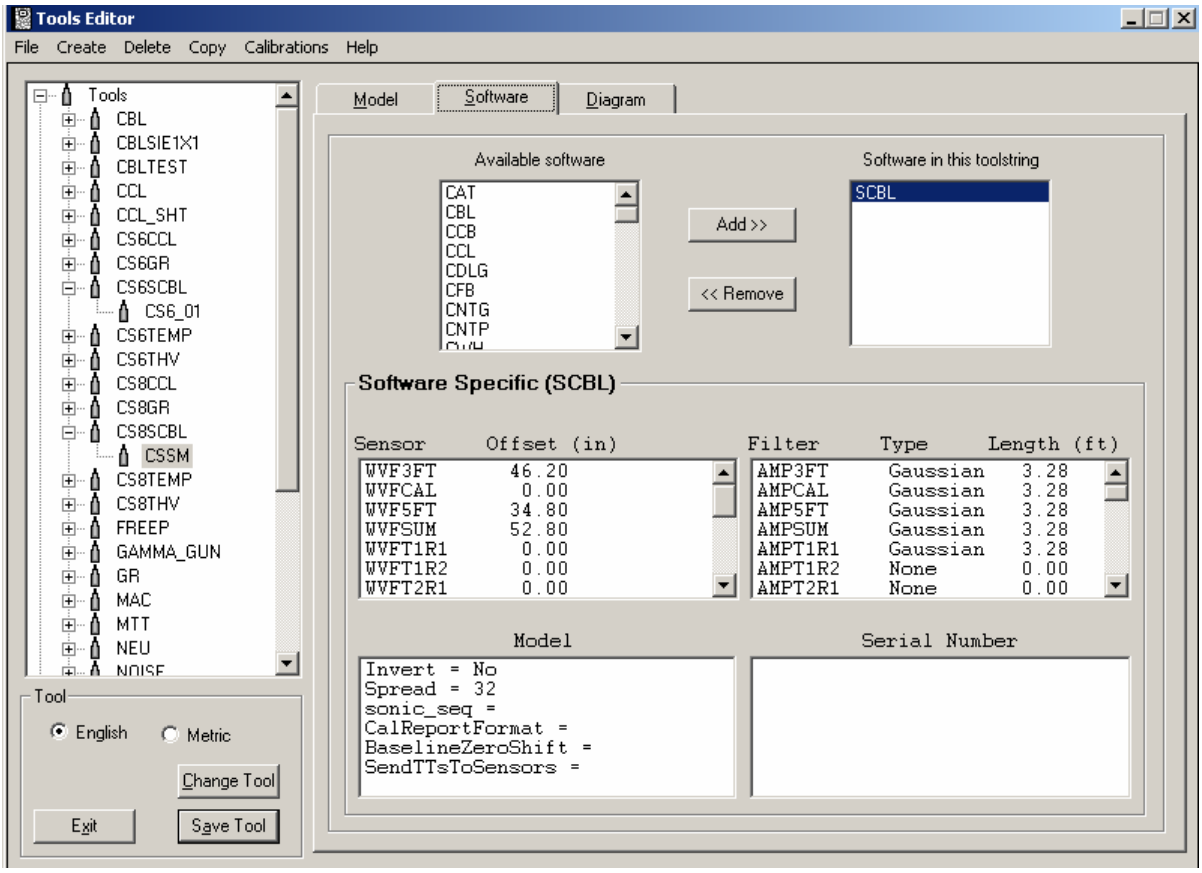


FIG: 6.3 Select Tool Model

Sensor Offsets should be measured from the lower makeup joint of the tool. Note that the sensor measurement for a source / detector or transmitter / receiver pair is half way between the two points. To change a sensor offset, double click on the sensor to bring up the edit box. Enter the appropriate measurements and click save.

FIG: 6.4 Set Offset

To change a filter setting, double click on the appropriate sensor. There is a drop down list for the different filter types. Square filtering should be used with sensors that would change slowly, such as Tool Voltage, while Gaussian filters should be used with statistical sensors, such as Gamma Ray. The longer the Filter Length, the more pronounced an effect the filtering would have.

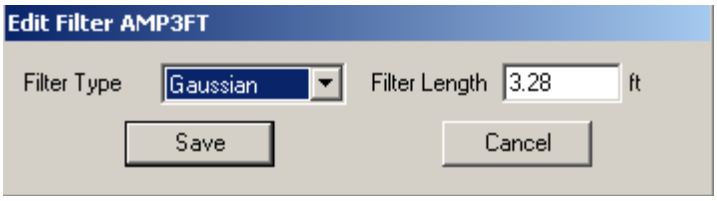


FIG: 6.5 Select the Filter Type and Filter Length

For some software modules, a specific Cal Report (Calibration Presentation) can be selected for the tool model.
The Model area contains information that is again determined by the software type. The Serial Number section is used for limited types of tools at this time.

6.2 Tool Diagrams

The diagram section of the tool editor allows the used to select or create tool diagrams for the tool model. If no Name is entered, the tool will be represented in tool string diagrams as a rectangle with the length and diameter given in the Model Specific area. The browse button next to the name box can be used to select an existing Warrior tool diagram. The selected tool diagram will now appear in the diagram window. The Zoom button can be toggled to change the display to see the complete width that will be displayed in a tool string diagram, although the length may not be to scale.

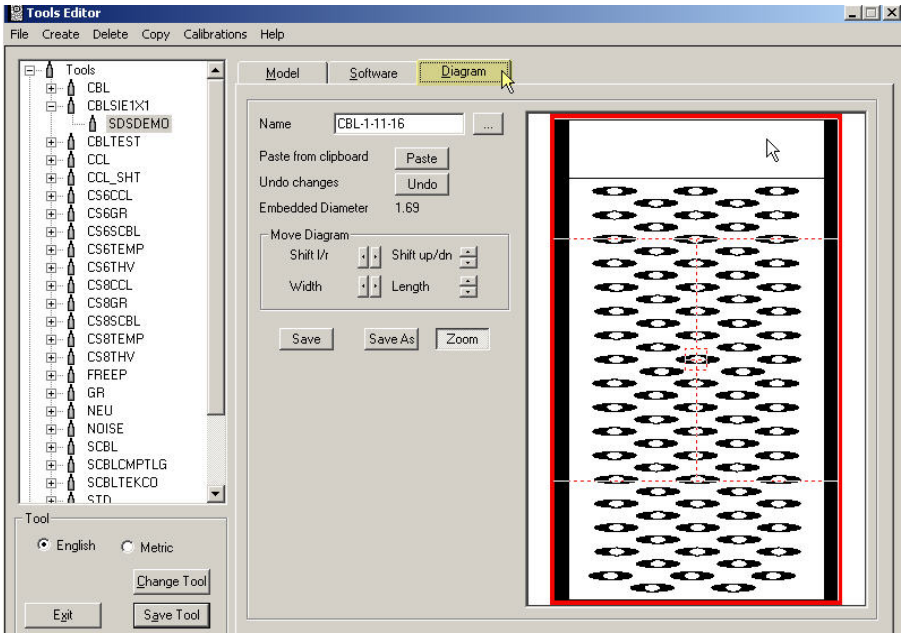


FIG: 6.6 Select Diagram

If you want to create your own tool diagrams using a third party graphics package, the only requirement is that the output file format be either Windows Metafile (*.wmf) or Windows Enhanced Metafile (*.emf). Once you have created the file, copy it to your warrior\format directory and rename it to (*.wtd) for Warrior Tool Diagram.
In order for any diagram to line up when it is placed in a tool string, it needs to be modified by using the Tools Editor. Select the diagram you want to edit from the Tools Editor and the image should appear on the right side of the window. A red box will appear also which indicates the location where the image should appear in order for it to line up with another image of the same diameter. It is important that the image be sized using the proper diameter. If you have two devices that you want to use the same image for but they have different diameters, then you need to save two different tool diagrams, one for each diameter.
To size the image, use the buttons to change the width and height as well as shift the image up/down and left/right. You can also use the mouse to drag the image into position. The mouse moves the image by clicking and dragging from the appropriate portion of the screen.
Some tools, such as centralizers, may extend outside the red box.
When you click the save button, the image gets written to disk and then read back and redrawn to verify that the save was done properly.

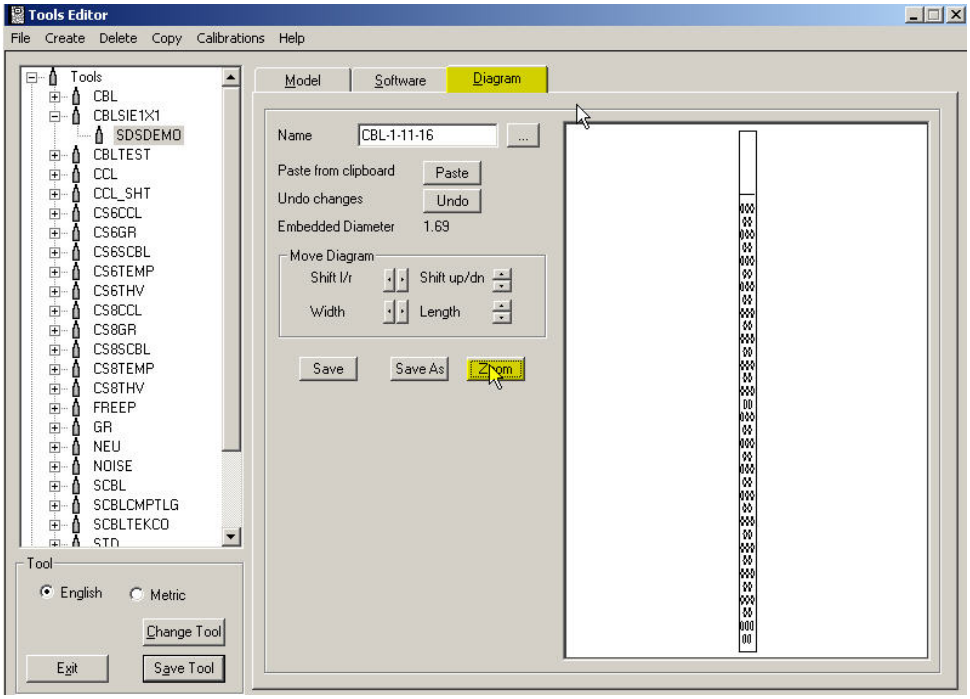


FIG: 6.7 Select Zoom

In the zoom mode, the red rectangle reflects the appropriate length and diameter specified for the tool. The user can now use the controls in the Move Diagram box to resize and configure the drawing as needed to shift the drawing **left/right** or **up/down** or to **widen/narrow** or **lengthen/shorten** the drawing. Ideally, the body of the tool should fit the red rectangle, with external components (centralizer springs, etc.) allowed to extend outside of the red rectangle.
Within the red rectangle, there are four quadrants. The mouse can be used in each of these quadrants to configure the diagram in the same manner as the Move Diagram controls. By clicking the mouse in the top quadrant and dragging it up or down, the diagram will move up or down. Clicking and dragging up or down in the bottom quadrant will lengthen and shorten. Clicking and dragging to the left or right in the left quadrant will move the diagram left or right. The right quadrant will widen or narrow the diagram.

Once the diagram has be resized and configured as desired, the **Save** and **Save As** buttons can be used to save the diagram as a Warrior Tool Diagram. The Save button will replace the existing diagram that was called up. Be aware that if any other model of tool uses this diagram, the drawing will be changed for that model also. The **Save As** button will prompt you for a new file name.
The Undo button, will undo any changes that have been made since the file was opened or since the last Save or Save As.
The user can create his own tool diagrams by pasting from the Windows Clipboard. Using a drawing application, you create the initial tool drawing. Then copy it onto the windows clipboard (**Edit – Copy**, right mouse click **–Copy,** etc). When the paste button in the tool editor is clicked, you are first prompted to enter or select a file name for the drawing. When the file name is saved, what ever is on the Windows Clipboard is displayed in the diagram window. The drawing should then be reconfigured as described above to fit into the red rectangle. Finally it should be saved again after the reconfiguration.

6.3 Creating a New Serial number for an existing tool model

If you have existing tools and wish to create a new serial number, find and select the serial number of an existing tool in the tool drop down list. Then on the menu bar, click **Create** - **Tool.** The New Tool dialog window will then come up and show the selected tool type, model type, the software module being used, and a list of existing serial numbers for that tool type. Enter a new serial number in the New Serial Number box and click **OK**. The new tool will use the same physical dimensions, sensor offsets, filters, and tool diagram as the model of the selected tool.

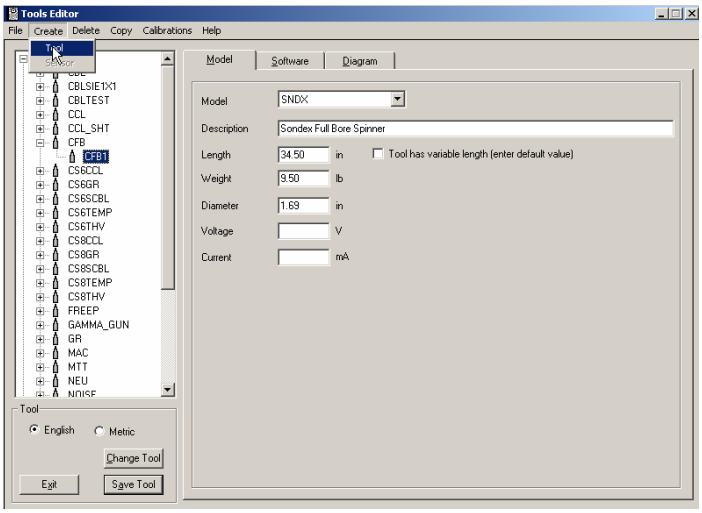


FIG: 6.8 Select Tool

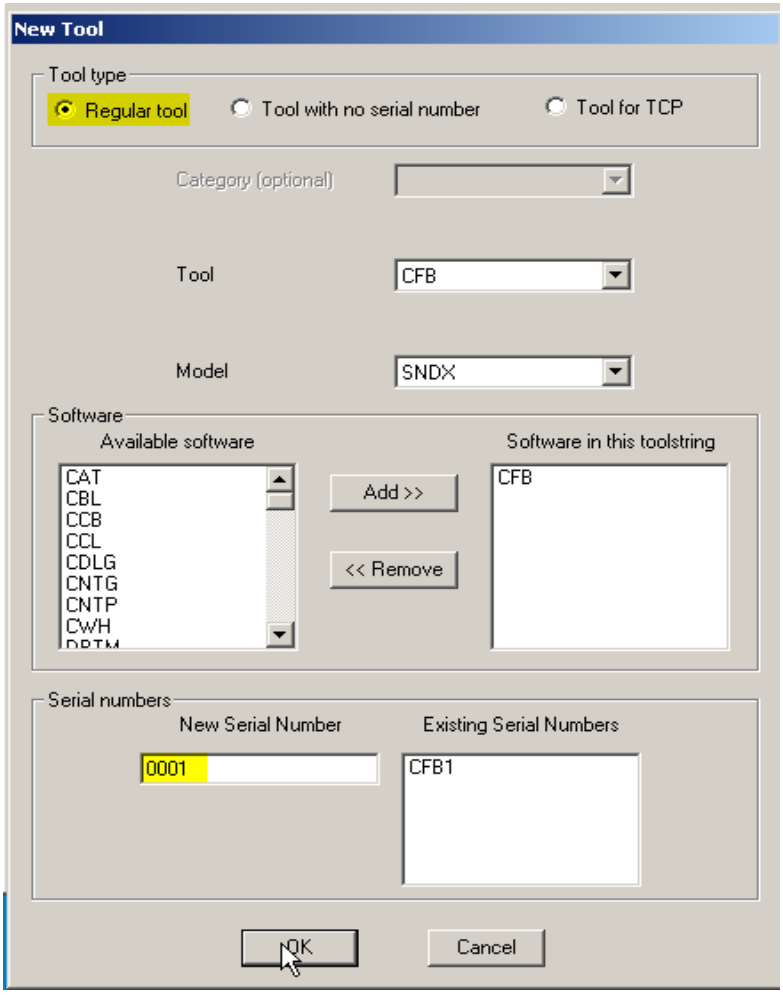


FIG: 6.9 Type the new serial number

VIDEO: 6.1 Creating a New Serial number for an existing tool model

6.4 Creating a new tool type or a new model for existing tool

To create a new tool, click on the **Create** selection in the Tools Editor menu bar. To create a new tool type, click the Tool drop down list and click on the first item in the list, <new tool type>.
You will then be prompted to enter a new tool type. - Be aware that any new tool that you have created can only be used if a Service in Services.INI lists that tool type as one of its available tools.
If you are creating a new tool type, the Create New Model Type box will appear. If you are going to create a new model for an existing tool type, once the tool type has been selected from the Tool drop down list, from the Model drop down list, select the first item in the list, <new model type>.

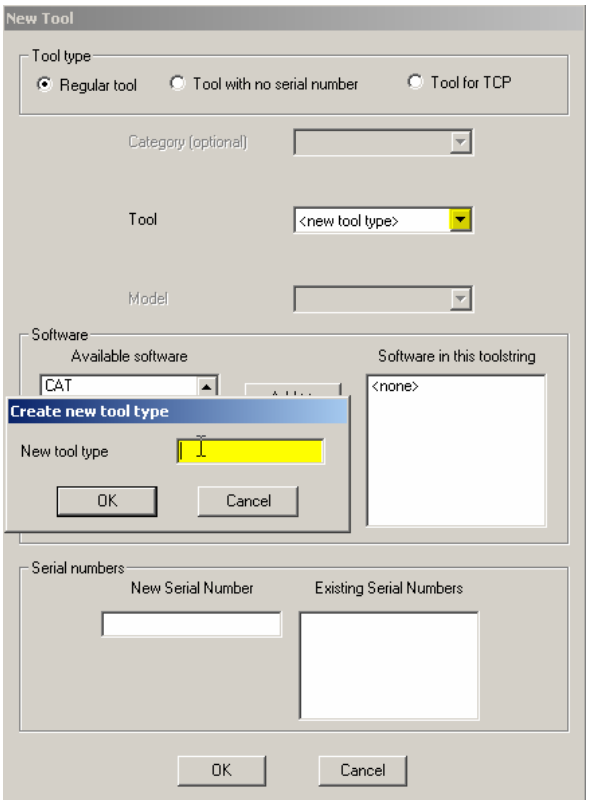


FIG: 6.10 Select new tool type and create a new tool type

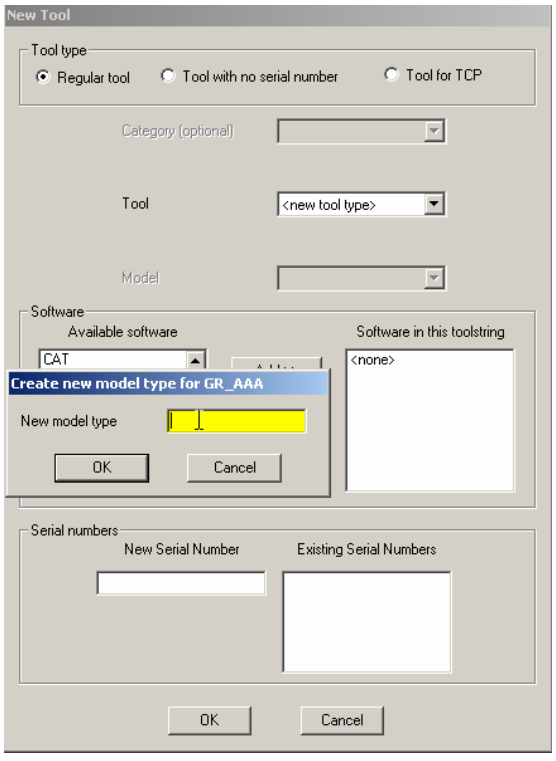


FIG: 6.11 Create new model type

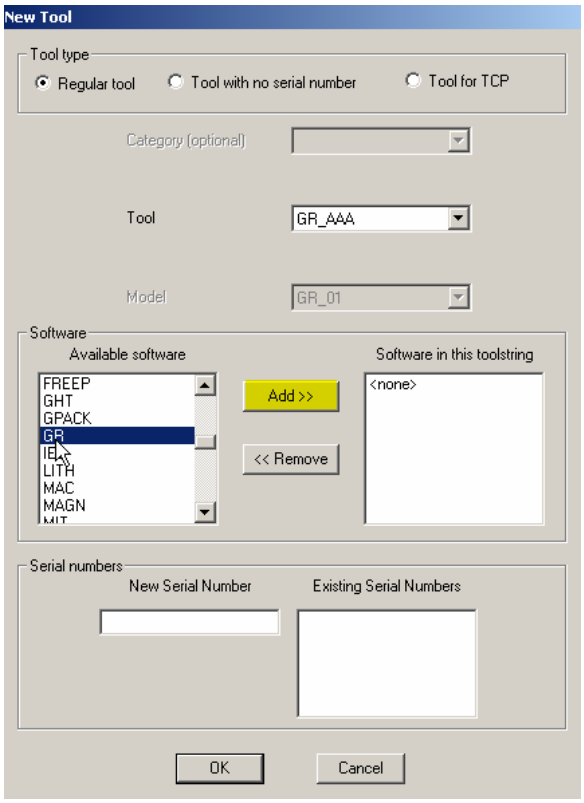


FIG: 6.12 Select GR software for GR tool.

You will then be prompted to enter a new model type. For any new model type, the software module(s) to be used must be selected from the software drop down list and then click the **ADD>>** button.

Warning! Tool names, Model names, and Serial names can contain a maximum of 39 characters and cannot have any spaces.

Continue selecting and adding software modules as need to include all of the sensors in the tool. A list of sensor for the different software modules is included At The of this section (Software Module Description).
The last step is to enter a New Serial Number. An Existing Serial Number drop down list is provided so that duplicate serial numbers are not entered.
Certain software modules will allow you to also create a new sensor. Note that all boxes of the Sensor Details section must have data entered for the created sensor to work properly. The Sensor is the name that you wish to have as an output; it cannot be a duplicate of any sensor that would be in the same string of tools. The Units can be chosen and printed on the log insert and calibration reports. The Description can be printed on calibration reports that include this sensor.
Once the basic sensor has be created and saved, reciprocal and/or differential outputs can also be created for the same sensor.

VIDEO: 6.2 Creating a new tool type or a new model for existing tool type

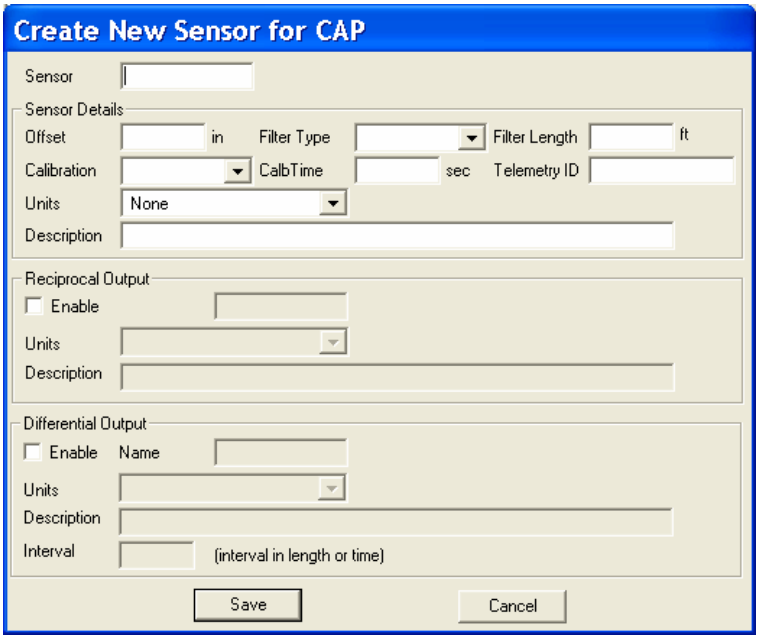


FIG: 6.13 Create a new Sensor

6.5 Creating a Tool

As an example, we will go through the steps necessary to create a new tool sting for a Gearhart COSMOS GR/N tool. One version of the Gearhart COSMOS Gr/N tool is a single tool that is approximately 7 ¼ feet long and 1 11/16" in diameter, has a total weight of 25 pounds, and has three sensors, gamma ray, collar locator, and neutron. There are two different ways that we can create this tool. We can break it up into three separate tool types, with each type having its own software module. Or, we can make one tool type that has three software modules. We will do an example of each way.

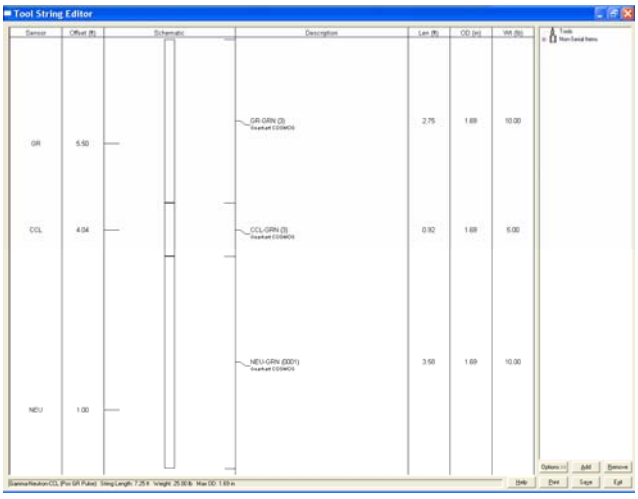


FIG: 6.14 Tool string editor

First we will do the three separate tool types with each type having its own software module.
The first tool we will create is the neutron. Open the tool editor and click **Create** – Tool. Scroll down the Tool drop down list to NEU (if not in the list, click <New Tool Type> and enter NEU). Now enter a Model name by clicking on the model drop down list and clicking <New Model Type> and entering COSMOS (if not already in the list). Use the Software drop down list to pick NEU software, and it to. Enter a unique serial number (CMOS001) in the New Serial Number box. You should now have a tool created but with no information for it as shown.

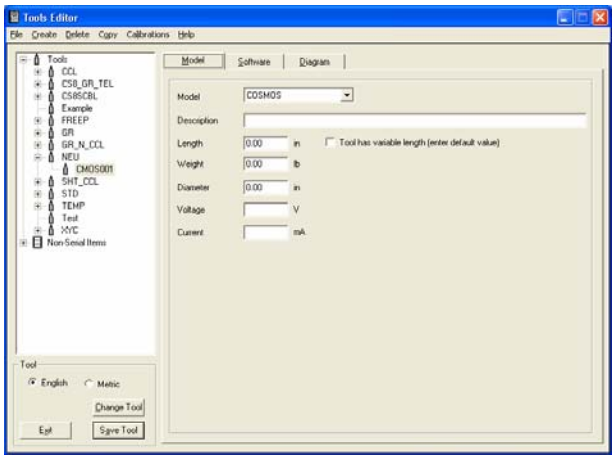


FIG: 6.14 Select Tools Editor

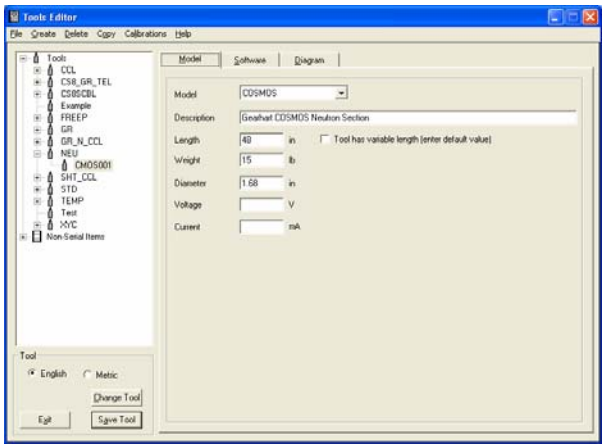


FIG: 6.15 Select Model

Now we will have to enter all of the information for our COSMOS model of neutron tool. The length from the bottom of the source to the ccl joint is 48", the weight we will guess at 15 pounds, the diameter is 1 11/16" or 1.68".
The neutron detector is 14" from the bottom of the tool, but if we measure from halfway between the neutron source and the neutron detector to the bottom of the tool we measure 8", so our NEU offset is 8". We will set the filter type to use a Gaussian 3 foot filter to start with.

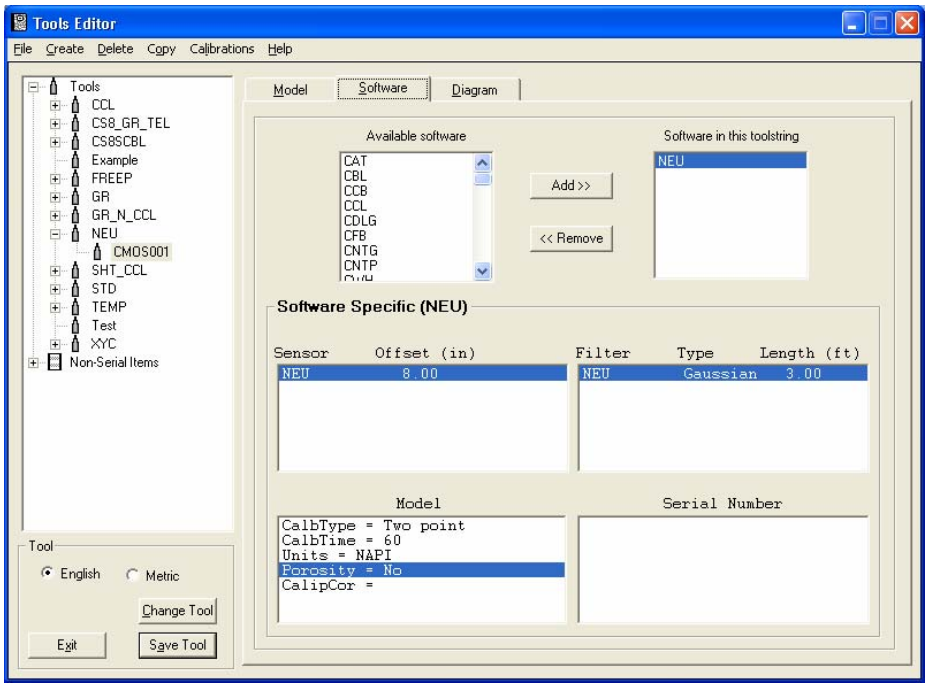


FIG: 6.16 Set Sensor, Filter, and Model values

We will use a two-point calibration, and use 60-second averaging for the calibration time. We will plot our output as Neutron API counts (NAPI), and not have a porosity curve. Our completed neutron tool should look as shown.

We will use the length and diameter rectangle for a tool diagram Therefore we will not have to do anything on the Diagram page.

We now need to create our next tool – the CCL. Click on **Create** – **Tool**. Chose **CCL** from the Tool list. Check the Model list for COSMOS. If COSMOS is not in the list, chose new model type and enter COSMOS. Software should be set to CCL and a New Serial Number will need to be entered (CMOS001).

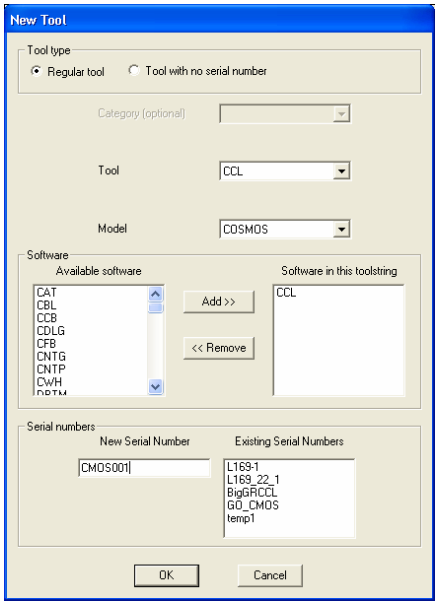


FIG: 6.17 Set New Tool

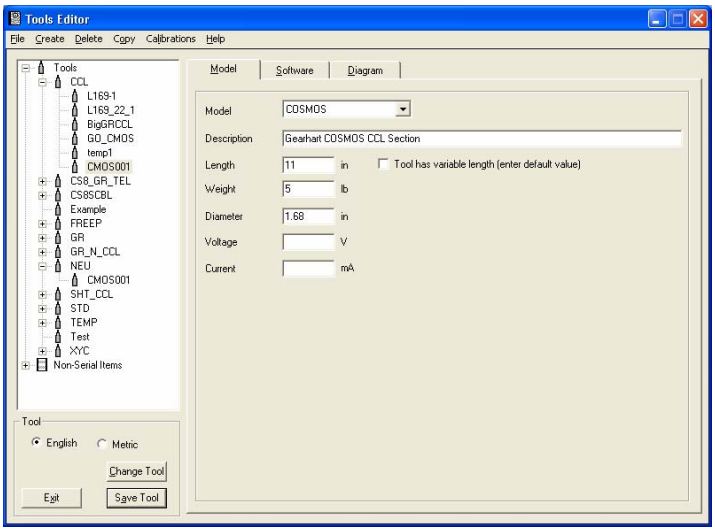


FIG: 6.18 Set Model values

The length from the lower case to the upper case is 11 inches, we will guess at a weight of 5 pounds, and the diameter is 1.68 inches. The center of the CCL coils is 5 1/2" from the bottom case. We do not want to use any filtering with a CCL, so we set the filter to NONE and the length to 0.00 Feet. We will not set any of the model specific parameters.

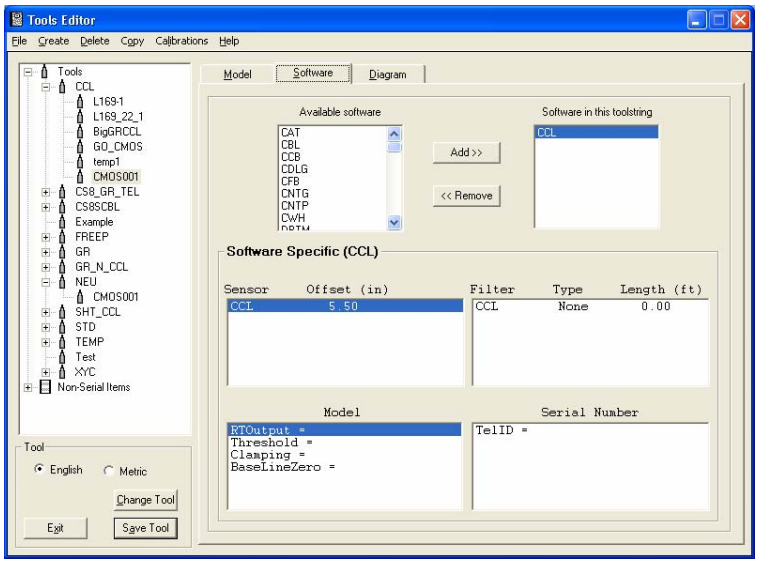


FIG: 6.19 Set Sensor, Filter, and Model values

Finally, we need to create our Gamma Ray tool. Once again click on **Create** in the menu bar. Then choose **Tool**. Scroll down the **Tool** drop down list to **GR** (if not in the list, click on **<New Tool Type>**and enter GR). Now click on the **Model** drop down list and click on **<New Model Type>**, and enter COSMOS. Click on the **Software** drop down list and choose GR software. Enter a serial number (CMOS001) in the **New Serial Number** box.

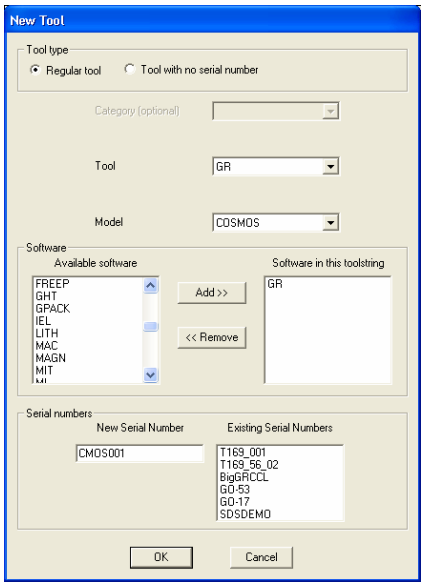


FIG: 6.20 Set New Tool

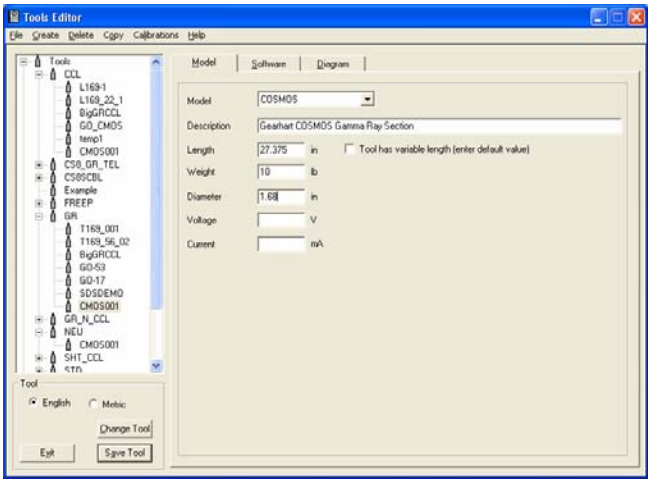


FIG: 6.21 Set Model values

We now need to enter our model specific information. A tool description can be entered if desired. The length from where the upper case makes up to the top of the tool is 27 3/8". We will guess at a weight of 10 pounds. The diameter is 1 11/16".
The center of the gamma detector on this particular model is 16.68 inches up from the CCL. We want to use a Gaussian filter of 5-foot length, since this is a GM type detector. We will set this up with a two-point calibration with a gain and offset and use 60-second averaging. The output will be plotted a Gamma Ray API counts (GAPI). We will not do field verification. Our completed Gamma tool should look as shown below.

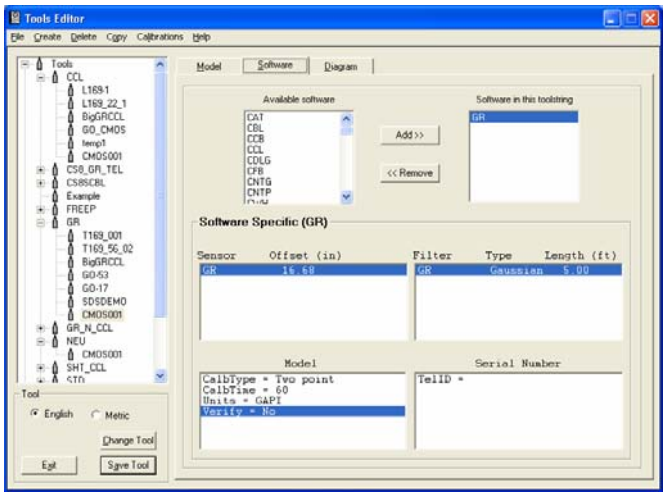


FIG: 6.22 Set Sensor, Filter, and Model values.

This completes all three sections for the tool being set up as separate tool types. To use this tool in a service, the service must include each of the separate sections in the list of available tool types (GR, CCL, and NEU). When the service is selected from acquisition and the tool string editor comes up, the proper configuration must be set up (GR on top, CCL in the middle, and Neutron on bottom), and the serial number for each section should be selected.

Now we will go through the same process of creating the tool, but will use a single tool type with all three software modules.

Click on Create, then Tool. Click on the tool drop down list and choose new tool type. Enter GR_N_CCL for the tool type. For the new model type, enter COSMOS. Choose and add the GR, CCL, and NEU software modules. Enter CMOS001 for a serial number.

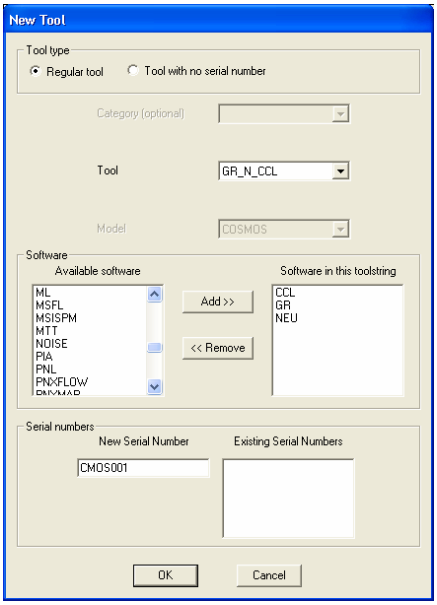


FIG: 6.23 Set New Tool

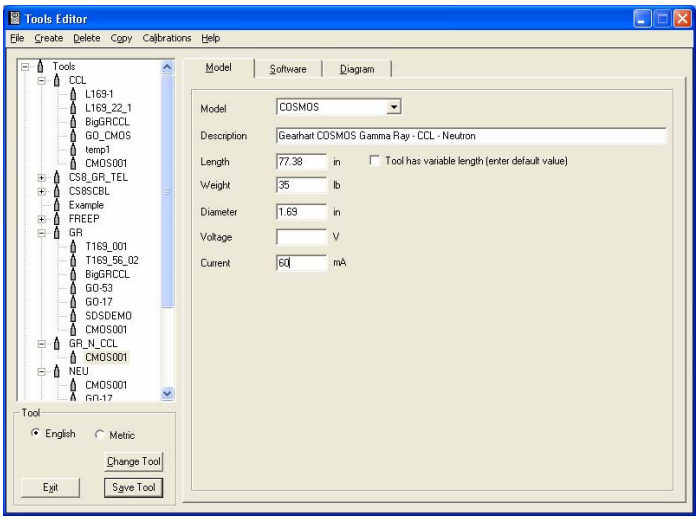


FIG: 6.24 Set Model values

The overall tool length is 77 3/8", weighs 35 lbs, and is 1 11/16" OD. This information is entered into the Model page. We measure the CCL from the bottom of the tool to the middle of the coils as 44.5 inches. The Gamma Ray detector is 66 5/8" from the bottom of the tool. And the Neutron measure point is 8 inches as in the previous example. For each software type, we will have to set up the appropriate sensors using these offsets. We will do the CCL module first. The offset is 44.5 inches. The rest is set the same as the previous example. We do not want to use any filtering with a CCL, so we set the filter to NONE and the length to 0.00 Feet. We will not set any of the model specific parameters.

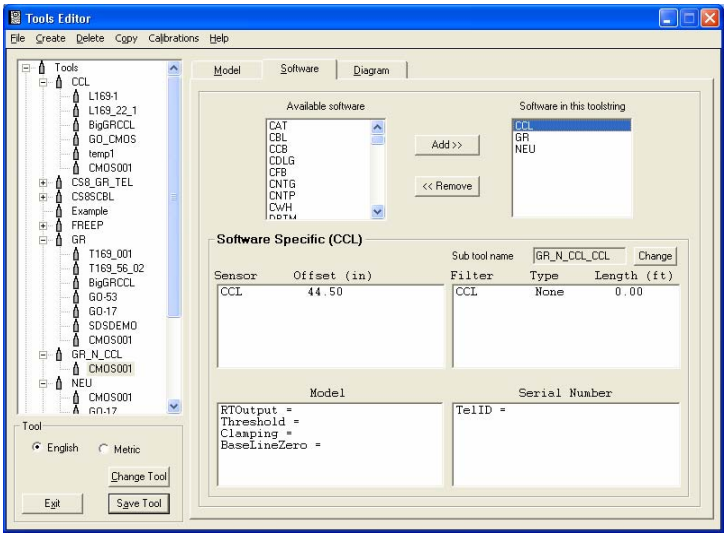


FIG: 6.25 Set Sensor, Filter, and Model values

To edit the Gamma Ray sensor, click on the GR software in the list. The sensor offset is 66.68 inches. The rest of the information is the same as the previous example. Gaussian 5-foot filter, two point calibration, 60-second calibration averaging, output as Gamma Ray API counts (GAPI), and no field verification.

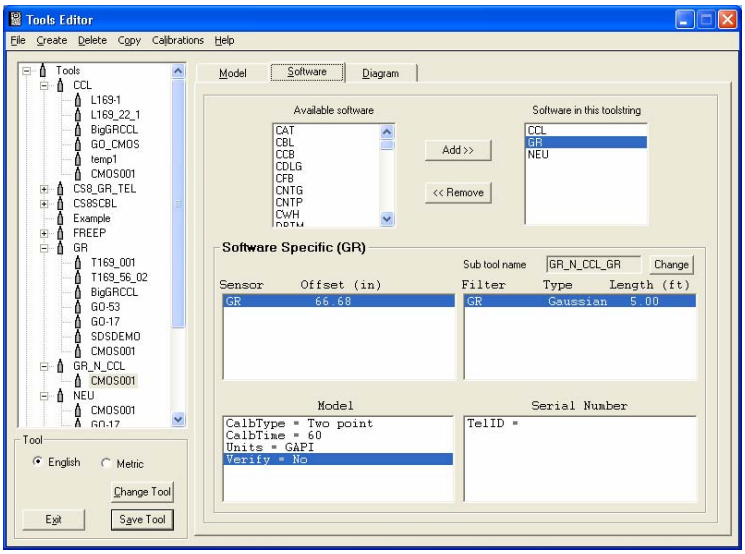


FIG: 6.26 Set Sensor, Filter, and Model values

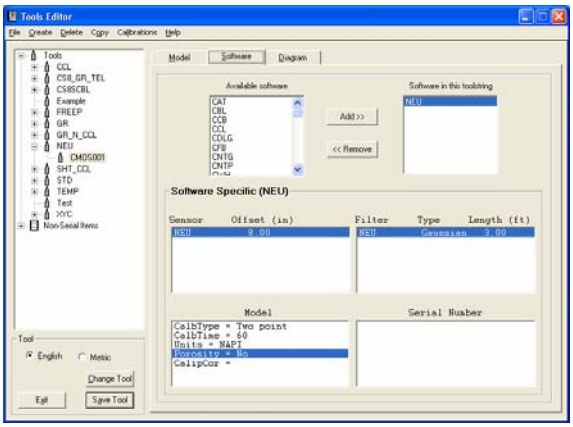


FIG: 6.27 Set Sensor, Filter, and Model values

Select NEU software to edit the neutron senor settings. Our NEU offset is 8", Gaussian 3 foot filter, two point calibration, 60-second averaging, and output as Neutron API counts (NAPI), and not have a porosity curve.

6.6 Deleting Tool Entries

Options are available under the **Delete** selection of the menu bar. Sensors, Serial Numbers, Models, or Tool types can be deleted. Be careful in deleting information. Read the whole confirmation box closely. You would not want to lose a whole tool type when you meant to delete only a serial number. If a tool model has a user-defined sensor, click on the **Sensor** listed in the software specific area, and then clicking on **Delete** -> **Sensor** will remove that sensor from the tool model.

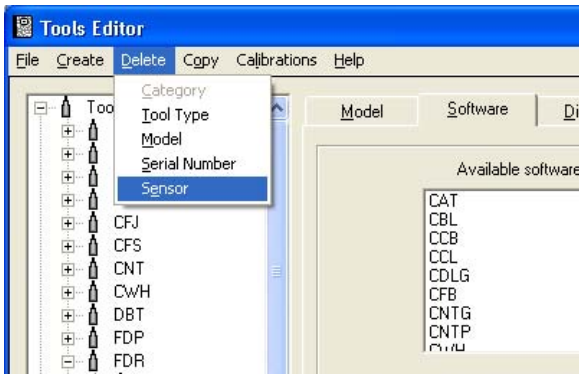


FIG: 6.28 Select sensor option to Delete

If a specific tool serial number has been selected from the tool list, then clicking on **Delete** -> **Serial Number** will remove that specific tool serial number from the tools.ini file.
If a tool type has been selected from the tool list, then clicking on **Delete** -> **Model** will provide a drop down list of models of that type of tool. Selecting a specific model and clicking **OK** will allow you to delete that model only if no serial numbers are currently set to that model type.
If a tool type has been selected from the tool list, then clicking on **Delete** -> **Tool Type** will delete all information for that type of tool. This includes all serial numbers and model information for any tools that are of that tool type.

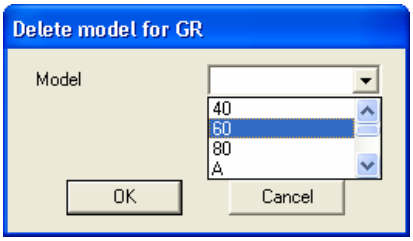


FIG: 6.28 Delete model for GR

6.7 Saving Calibrations

Calibrations can be saved to disk or restored. This is meant to be an aid in the transfer of calibrations between different units or to transfer tool type and model information from one unit to another.

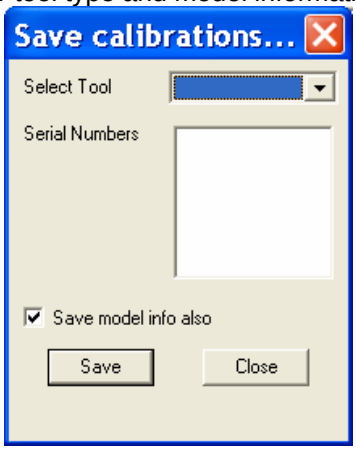


FIG: 6.29 Select Tool

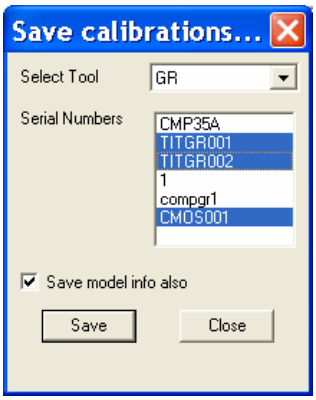


FIG: 6.30 Select GR Calibration

On the menu bar click on **Calibrations**, then click **Save.** Only one tool type can be selected, but as many serial numbers as desired can be placed into the file. The model information for each selected serial number can also be included. The file is given a WCF extension but is a mini tools.ini file if the model information has been included. When the **Save** button is clicked, the save dialog box is brought up. The default is file name is the tool type and it is saved into the Warrior\Config directory. You can change the drive, folder, and name of the file.

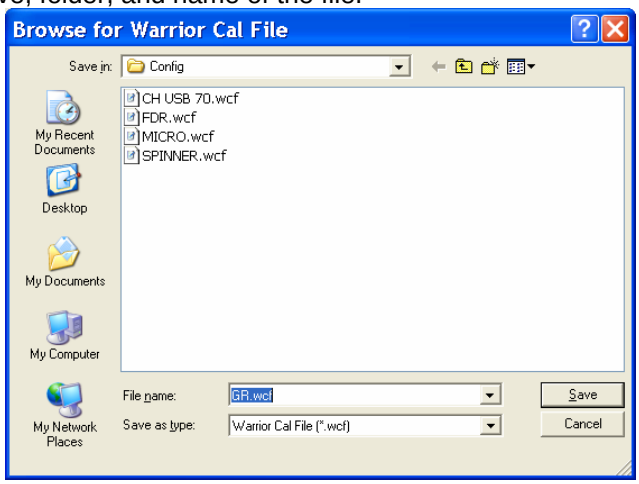


FIG: 6.31 Save GR calibration

If you select an existing WCF file, you will be given the option of appending to the file or overwriting the file.

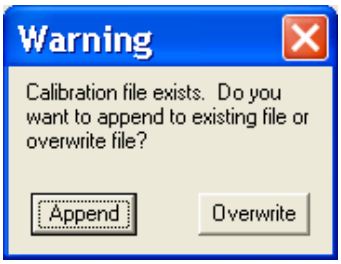


FIG: 6.32 Save GR

To restore calibrations, click on **Calibrations** on the menu bar, then click **Restore.** When the dialog box appears, select the saved file from the appropriate drive and directory. Then select as many serial numbers as desired to be restored.

Software Module Descriptions

Software	Description	Sensors	Outputs
CBL	Cement Bond Log – 1 and 2 receivers	3FT, 5FT	AMP3, AMP5, TT3, TT5
CCB	Obsolete – USE SCBL		
CCL	Casing Collar Locator	CCL	CCL
CDLG	Compensated Density Log	LSD, SSD, DCAL, PER	LSD, SSD, DCAL, PER, RHOB, RHOC
CFB	Caged Full Bore (Spinner Tool)	User Defined	FRATE, FDIR
CNTG	Obsolete – USE CNTP	------	------
CNTP	Compensated Neutron Tool	CNLSC, CNSSC, (NCAL)	CNLSC, CNSSC, CNRAT, CNLS, CNSS, CNDL, CNAD, CNPOR, CNPORU, (NCAL)
CWH	Capacitive Water Holdup	CWH	CWH
DETECT	Tracer Detector	DET	(Outputs are derived from EJECT)
DILG	Dual Induction Log - Gearhart	CILD, CILM, RLL3, SP, (CLL3)	CILD, CILM, CLL3, RILD, RILM, RLL3, SP
DILP	Dual Induction Log - Phoenix	CILD, CILM, RLL3, SP	CILD, CILM, CLL3, RILD, RILM, RLL3, SP
DILWAH	Dual Induction Log - Hotwell	ILD, ILM, LL8, SP	CILD, CILM, CLL8, RILD, RILM, RLL8, SP
DIPM	Dipmeter	PAD1-PAD6, PADF, CAL1-CAL6, EA, EB, EC, EX, EY, EZ	PAD1-PAD6, PADF, CAL1-CAL6, INCL, RB, AZI, BDIR, GFLD, BFLD
DLL	Obsolete – USE DLLP	------	------
DLLP	Dual Lateral Log	VD, VS, ID, IS, DLLCAL	VD, VS, ID, IS, RLLD, RLLS, CLLD, CLLS

FIG: 6.33 Software Module Descriptions

EJECT	Tracer Ejector	- none -	EJECT, AREA, DET1, DET2, etc.
Software	Description	Sensors	Outputs
ELOG	DETEQ ELOG tool	IEE, VSN, VLN, SP	IEE, VSN, VLN, SP, RSN, RLN, CSN, CLN, SPR
FDP	FLUID DENSITY - Sondex	FDEN	FDRATE, FDEN, FDENC
FREEP	Free Point	FREEP	FREEP
GPACK	GRAVEL PACK Tool	?	?
GR	Gamma Ray Tools	GR	GR
IEL	INDUCTION ELECTRIC Log	DIC, SN, SP	DIC, DIR, SN, SP
LITH	Probe Litho- Density	W1, W2, W3, W4, SSD, Q, DCAL	W1, W2, W3, W4, SSD, Q, DCAL, LSD, RHOB, RHOC, DPOR, PE
MAC	Multi- Arm Caliper	MIN, MAX	MIN, MAX, MINRW, MAXRW, AVG, AVGRW, PCTRW, WDIFF
MAGN	MAGNOTOMETER?	?	?
ML	MICRO-LOG	MN, MI, MCAL, MSFL	MN, MI, MCAL, MSFL
MSFL	MICRO Spherically Focused	MSFL, MSFLCAL	MSFL, MSFLCAL
MSISPM	?	?	?
NEU	Single Detector Neutron	NEU	NEU, (NPOR)
NOISE	NOISE	RANGE1, RANGE2, RANGE3, RANGE4, NOISE, (200Hz, 400Hz, 1000Hz, 2000Hz, 4000HZ, 6000Hz)	200Hz, 400Hz, 1000Hz, 2000Hz, 4000HZ, 6000Hz
PIA	?	?	?
PNXFLOW	?	?	?
PRESTEMP	Pressure - Temperature	USER - DEFINED	USER - DEFINED
QPS	Quartz Pressure / Temperature	QP, QTMP	PRES, TEMP

FIG: 6.34 Software Module Descriptions

SCBL	Sector Cement Bond Log Compensated Cement Bond Log (BOND TOOLS WITH SEPARATE CAL SIGNAL WAVEFORM)	WVFCAL, WVF3FT, WVF5FT, WVFT1R1, WVFT1R2, WVFT2R1, WVFT2R2, WVFT1R3, WVFT2R3, WVFS1, WVFS2, WVFS3, WVFS4, WVFS5, WVFS6, WVFS7, WVFS8, WVFSYNC, WVFSUM	AMPCAL, AMP3FT, AMP5FT, AMPT1R1, AMPT1R2, AMPT2R1, AMPT2R2, AMPT1R3, AMPT2R3, AMPS1, AMPS2, AMPS3, AMPS4, AMPS5, AMPS6, AMPS7, AMPS8, AMPSIM, TTCAL, TT3FT, TT5FT, TTT1R1, TTT1R2, TTT2R1, TTT2R2, TTT3R1, TTT3R2, TTS1, TTS2, TTS3, TTS3, TTS4, TTS5, TTS6, TTS7, TTS8, TTSUM
SFT	Sequential Formation Tester	SPRES, HPRES, VTIX, SWPOS	- - - -
SGR	Spectral Gamma Ray	SGR	K, U, T, GR, GRUF
SLT	Sonic Logging Tool	TT1, TT2, TT3, TT4, WVF1, WVF2, WVF3, WVF4	DT, AMP1, AMP2, AMP3, AMP4
SLTN	Obsolete – USE SLT	----	----
STD	STANDARD – (Truck Settings)	- none -	
SWNP	Sidewall Neutron	SWN, SCAL	
TCC	?	?	
TEMP	Temperature	TEMP	TEMP, DTMP
USR	USER DEFINED TOOL	USER DEFINED SENSORS	USER DEFINED
XYC	X Y Caliper	XCAL, YCAL	XCAL, YCAL

FIG: 6.35 Software Module Descriptions

Section

7

7 Heading Editor

The Heading Editor allows the log heading information to be added to a blank heading of pre-existing format. Both Cased Hole and Open Hole style headers can be produced using Warrior.
It may be started from its icon in the Warrior shortcut folder, the Acquisition module under the Edit menu, Interactive Plot, or the Presentation Plot module. From the Heading Editor **File** menu, either a new header can be created or a pre-existing heading may be selected for editing. In addition, the actual format of the header may be selected from the predefined formats in the system by using **Select Format....** Once a heading has been selected, particular fields may be chosen for editing by using the **TAB** key, or by pointing with the mouse to move around the heading. When a field has been selected, a dialog box appears, and the appropriate information may be entered.
Headings are saved within, and retrieved from, Warrior well log databases. Headings, generated during a logging operation, are normally saved alongside the log data for that job.
To create a new heading and store it a specific database The Heading allows the log heading information to be added to a blank heading of pre-existing format. It may be started from its icon in the Warrior program group,

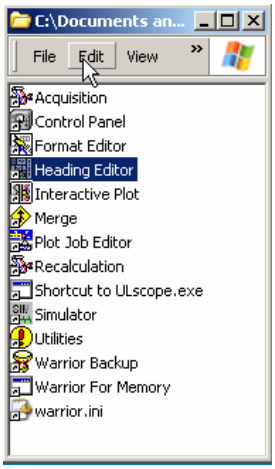


FIG: 7.1 Heading
Run Heading Editor from Warrior group. A blank heading appears

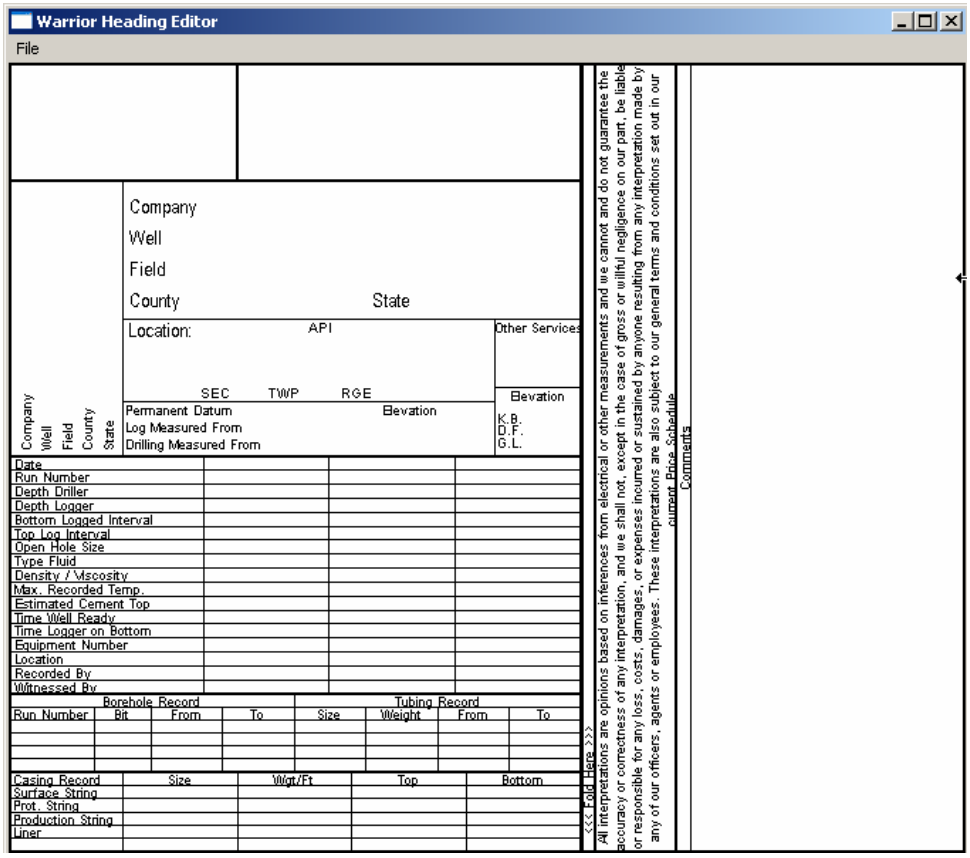


FIG: 7.2 Blank Heading

From the Heading Editor File menu, either a new or a pre-existing heading may be selected for editing. In addition the actual format of the header may be selected from those available within the system by using Select Format.

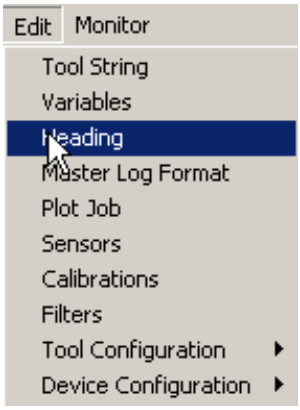


FIG: 7.3 Select Heading from Edit

Run Heading from the Acquisition or recalculation module under the Edit Heading
Select Reopen existing database,

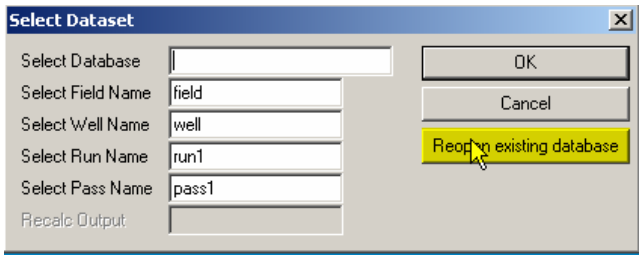


FIG: 7.4 Select Dataset

Select the database from the file selection box and then select the heading to be changed.

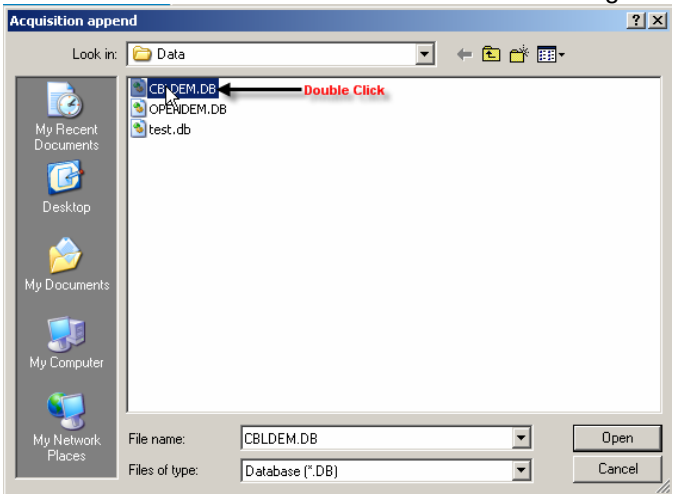


FIG: 7.5 Open Data Base

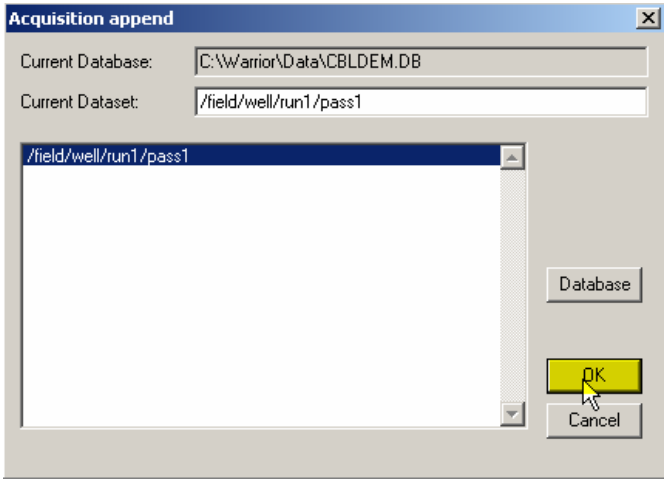


FIG: 7.6 Set Data Base run/pass

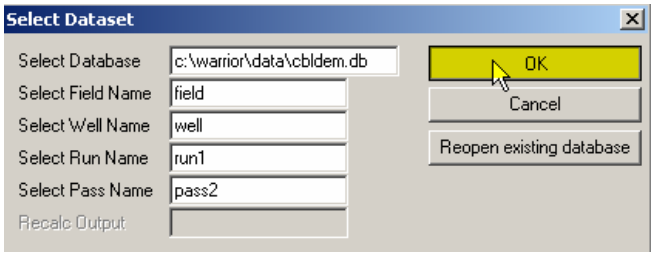


FIG: 7.7 Set Heading

Once a heading has been selected, particular fields may be chosen for editing by using the TAB key, or by pointing with the mouse to move around the heading. When a field has been selected, a dialog box appears, and the appropriate information may be entered.
Headings are saved within and retrieved from Warrior well log databases. Headings generated during a logging operation are normally saved alongside the log data for that job.
For fields with only a single line the appearance is as shown above. The description of the field appears above the dialog entry (e.g. Field), and the cursor is positioned for immediate text entry. When the text entry is complete hit Enter to move to the next field. Alternatively move to the OK button by using the TAB key or the mouse, and then hit Enter or click with the mouse.

FIG: 7.8 Type Well name

Fields which have multiple lines are completed using a slightly different dialog box as shown below

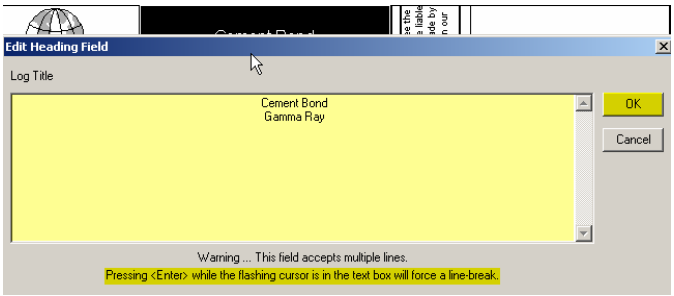


FIG: 7.9 Type Log Name

In this case the box appears with the OK button active. Use the TAB key or the mouse to move to the text entry box and enter the required text.

Warning! Do not hit Enter within the text entry box unless you wish to move to a new line within the current field, as for example, if multiple lines of text were to be entered in the Comments field.

When the text is complete use the TAB or mouse to move to the OK button and exit the dialog box as normal.
To save the modified heading under a different name use **Save As** from the **File** menu and enter a new name for the heading. The original heading will remain in the system under the original name. Use **Save** to save the modified heading under the original name.

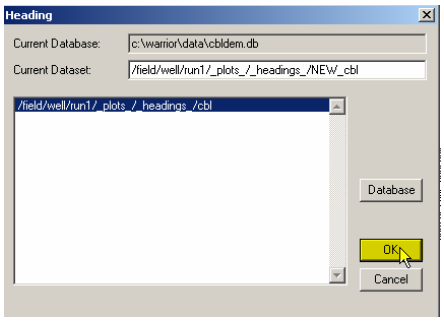


FIG: 7.10 Heading

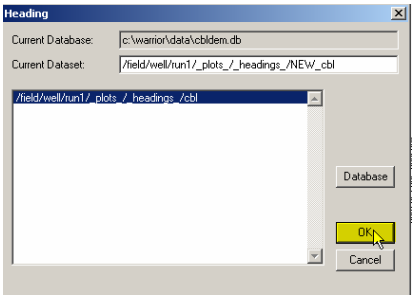


FIG: 7.11 Type the new Heading name File

7.1 Swap Logo

The logo accepts formats *** .lgo, .*.wmf, *.emf, *.bmb, *.jpg**. The file must be in Warrior\Config.
It should have the ratio 3 by 6 to keep the proportionality with respect the original one.
To select, or remove the Logo just Mouse Left click on Logo Box.

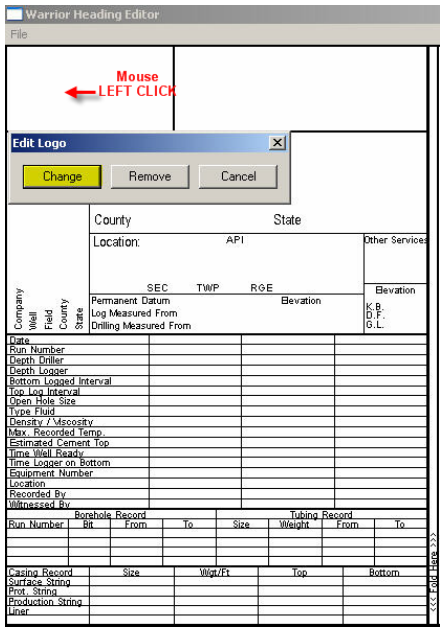


FIG: 7.12 Edit Logo

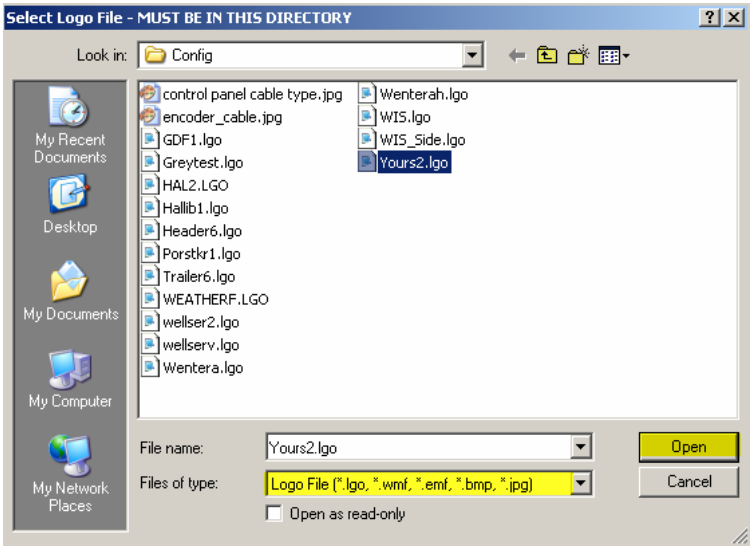


FIG: 7.13 Select the new Logo

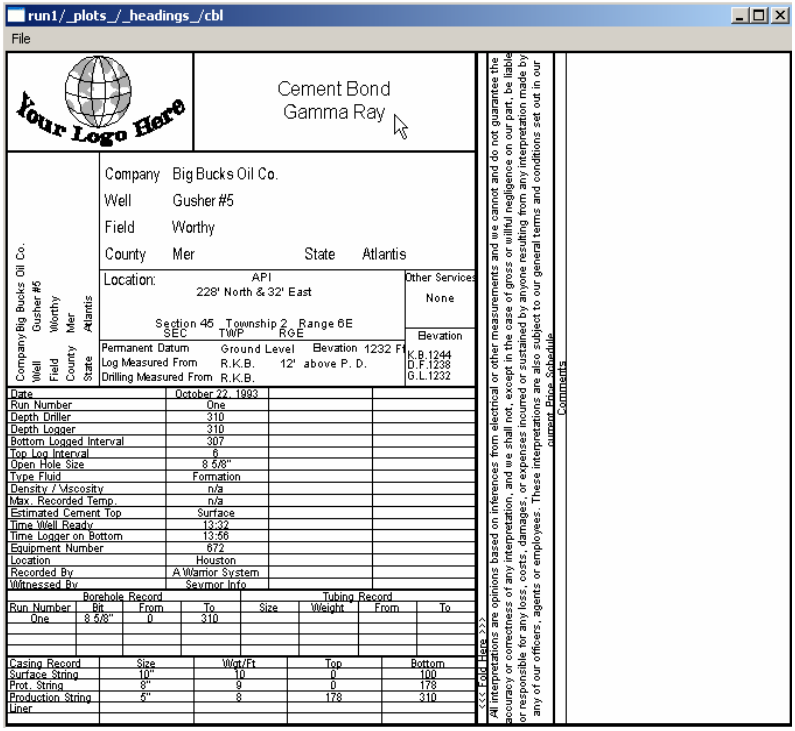


FIG: 7.14 Fill out Heading

VIDEO: 7.1 Heading

7.2 Heading File Creation

Warrior creates headings by reading a text file that has a .hdg extension. There are several different heading styles that are supplied with the Warrior software (stdcased, stdopen, and greytest). The purpose of this document is to supply the information need for the user to write his own .hdg text files.

The first two lines of the file define the physical size of the heading in inches as plotted. The width of the heading is the length of the plot from the plotter. The height is the width of the heading, with 8.25 being the standard API log width.

Width 10
Height 8.25

You must define panels to make the separate sections of the heading. Pictures, text, text edit fields, and panels may then be placed in the panels. Two pairs of x define the location of a panel and y coordinates as a percentage (0 to 100) of the current panel. The contents of the panel are enclosed in curly brackets.

Panel x1, y1, x2, y2
{
Panel Contents
}

The Border statement defines the thickness of the panel edge. The larger the integer N, the thicker the border will become.

Border N

The Font statement defines the font size of any text that is printed within a panel. The larger the integer N, the larger the font size.

Font N

Both the Font and the Border statement control the effects of the panel that they are in and all panels that are included in that panel, unless the included panel contains Font or Border statements, which are then used for that panel and any panels that it might include.

A picture may be placed within a panel. The location of the picture is defined by two sets of x and y coordinates as a percentage of the current panel. The name of the picture must be declared under the heading section of Warrior.ini and must be a captured Windows metafile (MFGRAB.exe is the normal method of acquiring this file).

Picture x1, y1, x2, y2 {NAME}

Text may be placed within a panel. The location of the text is defined by two sets of x and y coordinates as a percentage of the current panel. Previous font statements determine the size of the text. The orientation of the text is determined by a four-letter code - OTHV. The O is the orientation of the text, the T is the type of text, the H is the horizontal centering, and the V is the vertical centering. Text strings that are larger than the area specified may have unpredictable results. The might be truncated or extend outside of the defined area. Multiple line text will automatically wrap at a word boundary if the text exceeds the area length.

O H - Horizontal Text
V - Vertical Text
T S - Single line of Text
M - Multiple line of text
H L - Left justify for horizontal text, Bottom justify for vertical text
C – Center Text horizontally
V T - Top justify for horizontal text, Left justify for vertical text
C – Center Text vertically

TextOTHV x1, y1, x2, y2 "TEXT"

A text edit field may be placed within a panel. The location of the field is defined by two sets of x and y coordinates as a percentage of the current panel. Previous font statements determine the size of the text. The orientation of the text is determined by the same four-letter code - OTHV that is used with text. A hint name for the field is enclosed within curly brackets. A hint line is then added (normally at the end of the file) that will give a hint text to the user when he clicks on the field.

EditOTHV 0,0,100,100 {Hint Name}
hint "Hint Text" {Hint Name}

7.3 Headings LOG Banners File Creations

Warrior creates headings by reading a text file that has a .hdg extension. There are several different heading styles that are supplied with the Warrior software (stdcased, stdopen, and greytest). The purpose of this document is to supply the information need for the user to write or modify his .hdg text files.
In addition to heading files (*.HDG), well log banners (*.WLB) use the same form of text file but when printed, the orientation is rotated 90 degrees. Thus a heading has a height of 8.25 inches and a banner has a width of 8.25 inches.
Pipe Tally Tables (*.WRF) also use a similar format with some variance. The mode of entering user information is quite different.

The first two lines of the file define the physical size of the heading in inches as plotted. The width of the heading is the length of the plot from the plotter. The height is the width of the heading, with 8.25 being the standard API log width.
Width 10
Height 8.25

You must define panels to make the separate sections of the heading. Pictures, text, text edit fields, and panels may then be placed in the panels. The location of a panel is defined by two pairs of x and y coordinates as a percentage (0 to 100) of the current panel. The contents of the panel are enclosed in curly brackets.
Panel x1, y1, x2, y2
{
Panel Contents
}

The Border statement defines the thickness of the panel edge. The larger the integer N, the thicker the border will become. If N is 0, then there will be no border. The maximum thickness is 10.
Border N

The Font statement defines the font size of any text that is printed within a panel.
The larger the integer N, the larger the font size will become. The font range is from 1 to 6.
Font N

The FontFace statement defines the font style of any text that is printed with that size font on any text that is printed after the FontFace statement. The font style can be any True Type font that is included in C:\Windows\Fonts.
FontfaceN “style”
Both the Font and the Border statement control the effects of the panel that they are in and all panels that are included in that panel, unless the included panel contains
Font or Border statements. These statements are then used for that panel and any panels that it might include.

A picture may be placed within a panel. The location of the picture is defined by two sets of x and y coordinates as a percentage of the current panel. The name of the picture must be declared under

the heading section of Warrior.ini and must be a captured Windows metafile (MFGRAB.exe is the normal method of acquiring this file).

Picture x1, y1, x2, y2 {NAME}

Text may be placed within a panel. The location of the text is defined by two sets of x and y coordinates as a percentage of the current panel. Previous font statements determine the size of the text. The orientation of the text is determined by a four-letter code - OTHV. The O is the orientation of the text, the T is the type of text, the H is the horizontal centering, and the V is the vertical centering. Text strings that are larger than the area specified may have unpredictable results. The might be truncated or extend outside of the defined area. Multiple line text will automatically wrap at a word boundary if the text exceeds the area length.

O H - Horizontal Text
V - Vertical Text
T S - Single line of Text
M - Multiple line of text
H L - Left justify for horizontal text, Bottom justify for vertical text
C – Center Text horizontally
V T - Top justify for horizontal text, Left justify for vertical text
C – Center Text vertically

TextOTHV x1, y1, x2, y2 "TEXT"

A text edit field may be placed within a panel. The location of the field is defined by two sets of x and y coordinates as a percentage of the current panel. Previous font statements determine the size of the text. The orientation of the text is determined by the same four-letter code - OTHV that is used with text. A hint name for the field is enclosed within curly brackets. A hint line is then added (normally at the end of the file) that will give a hint text to the user when he clicks on the field.

EditOTHV 0,0,100,100 {Hint Name}
hint "Hint Text" {Hint Name}

Comments may be placed anywhere in the file. Comments normally have // as the first two printable characters on a line.

Width 10
Height 8.25
Panel x1, y1, x2, y2 {Panel Contents}
Border N
Font N
FontfaceN “style”
Picture x1, y1, x2, y2 {NAME}
TextOTHV x1, y1, x2, y2 "TEXT"
EditOTHV 0,0,100,100 {Hint Name}
hint "Hint Text" {Hint Name}
Comments

The above examples are the only commands that are in *.HDG and *.WLB files for headings and well log banners.

7.4 Pipe Tally Tables

Pipe Tally Tables have a few additional commands and the mode that Edit text commands gets their data is different. The edit text fields are pre-defined rather than defined by the Hint Command and are filled from editing the heading information of the pipe tally table, editing the grading of the settings, and from processing the log. The predefined fields are as follows:

{CONAME} – Company Name from Edit – Heading Information
{WELLNAME} – Well Name from Edit – Heading Information
{FLDNAME} – Field Name from Edit – Heading Information
{COUNTY} – County from Edit – Heading Information
{STATE} – State from Edit – Heading Information
{DATE} – Date from Edit – Heading Information
{COMMENT} – Comments from Edit – Heading Information
{RANGE1} through {RANGE6} – Maximum of six grading ranges from editing Settings - Grading
{SYMBOL1} through {SYMBOL6} – Maximum of six grading ranges from editing Settings – Grading
{GRADECNT1} through {GRADECNT6} – Count of the number of joints of that grading acquired from Scan Minimum Wall Log
{RWBC_LVAL} – Bar Chart Left Value from RWBC_LEFT of Warrior.ini
{RWVC_RVAL} – Bar Chart Right Value from RWBC_RIGHT of Warrior.ini
{RWUNIT} – Units of curve from Scan Minimum Wall Log
{NO***X***} – Number of Joint X from Scan Minimum Wall Log
{DEP***X***} – Top Depth of Joint X from Scan Minimum Wall Log
{LEN***X***} – Length of Joint X from Scan Minimum Wall Log
{RW***X***} – Remaining Wall of Joint X from Scan Minimum Wall Log
{PLX***X***} – Percentage Loss of Joint X from Scan Minimum Wall Log
{PLF***X***} – Percentage Left of Joint X (100-PLX***X***)
{RWBC***X***} – Remaining Wall Bar Code of Joint X for Bar Charts
{GR***X***} – Grade Symbol of Joint X from Range and Symbols above and scan
There are three addition command that are used to create *.WRF pipe tally tables.

They are as follows:

Repcount N
This line must be in the first 512 characters of the WRF file (normally place just after the Width and Height commands). It is a count of the number of joints to be shown on each sheet as the file is printed.

barchart x1,y1,x2,y2 {RWCBZ}
Charts bar code for Joint ***Z*** on RWBC_left to RWBC_right Scale

editHSCCB 0,0,100,100 {GR*Z*}
Prints Grade symbol for Joint ***Z*** horizontal centered both vertically and horizontally on a colored background. The color of the background is defined in Warrior.ini [Heading] section.
BkColorMap=grade1,{color1},grade2,{color2}, etc.
Where grade {x} is the symbol for a grade and color {x} is R, G, B set

Section

8

8 Format Editor

The Format Editor allows the creation and editing of the log presentation or format files. The output of the format editor are files of the type *.prs which are subsequently used to control all aspects of the log format. The Format Editor may be started in three different ways: From its icon in the Warrior group box, when started from the Warrior program group the Format Editor window appears as shown below, i.e. with no presentation available for edit

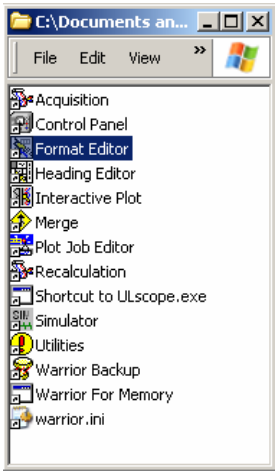


FIG: 8.1 Select Format Editor

The Format Editor may be started from its icon in Warrior shortcut folder, from the **Edit** menu of the Acquisition or Recalculation modules, from the **File** menu of the Presentation Plot module, or from the **Action** menu of Interactive Plot. In addition, double-clicking in the scales area of the Interactive Plot window will also start the Format Editor.
When started from Warrior shortcut folder or from Presentation Plot, the Format Editor window appears as shown below, i.e. with no presentation available for edit. If started from the Acquisition, Recalculation or Interactive Plot modules, the log format currently being used will be presented.
Displays a file selection window showing all the presentation files, currently available, within the system. The operator can select the presentation file to be edited. Note that all presentation files are to be found in the \warrior\format directory and have a prs extension.

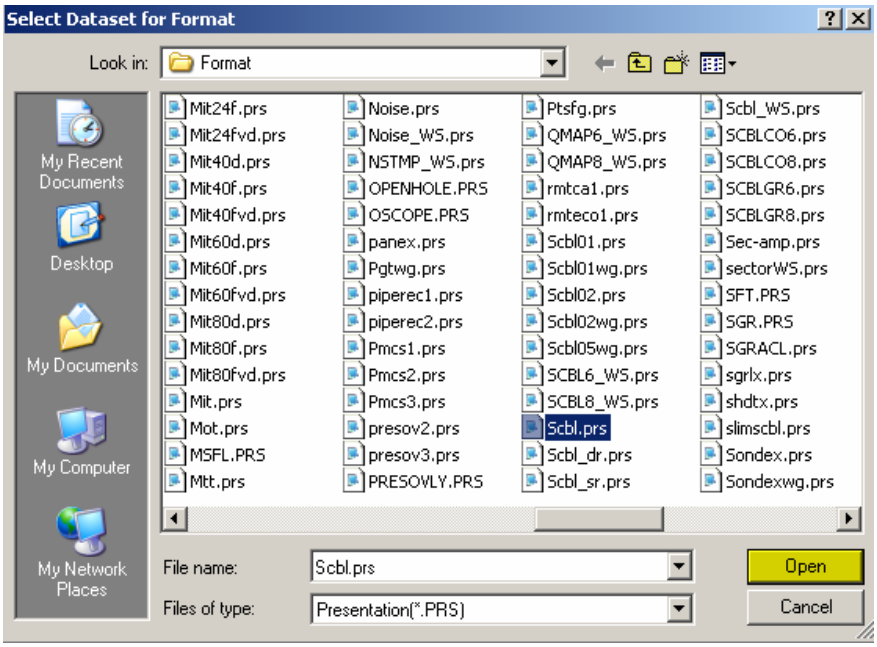


FIG: 8.2 Select Format

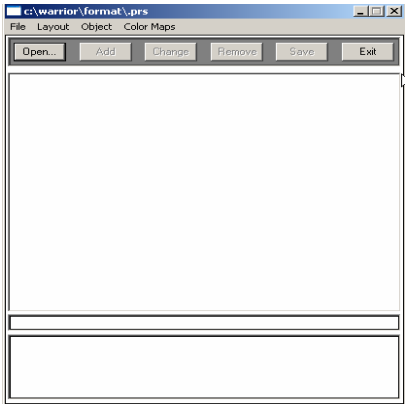


FIG: 8.3 Open Format

From the Acquisition or Recalculation modules select Edit menu (Master Log Format) the log format currently being used will be presented

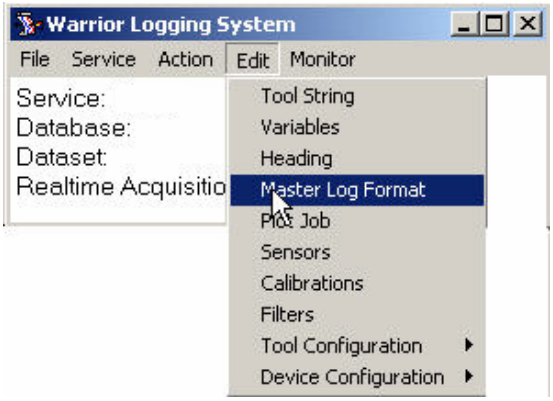


FIG: 8.4 Select Master Log Format

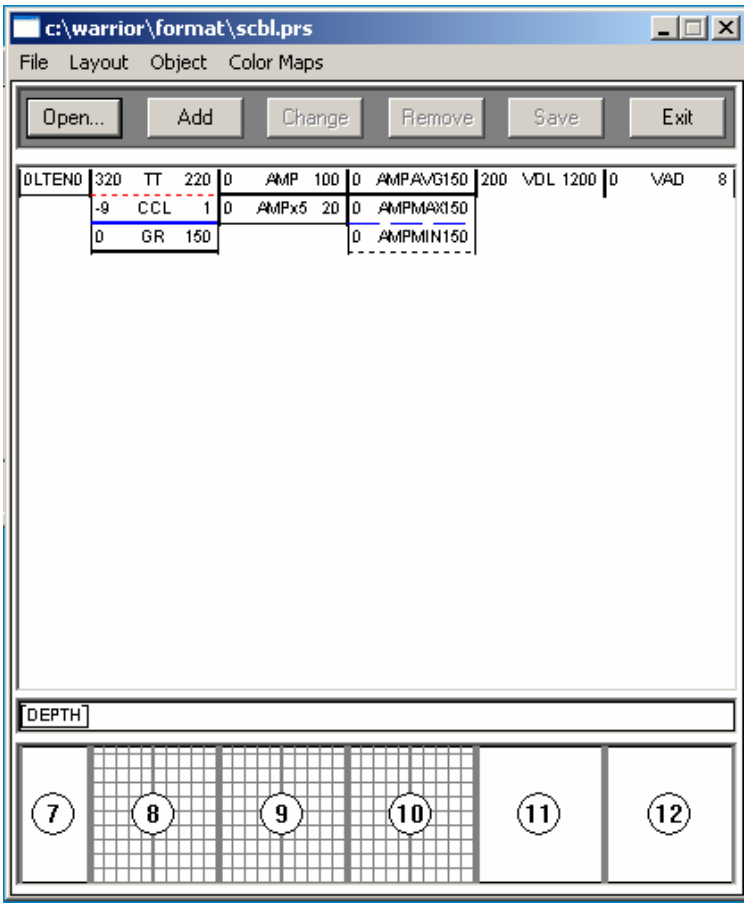


FIG: 8.5 Edit Format

From interactive plot select Action\Screen Plot menu. In addition double-clicking in the scales area of the interactive plot window will also start the Format Editor.

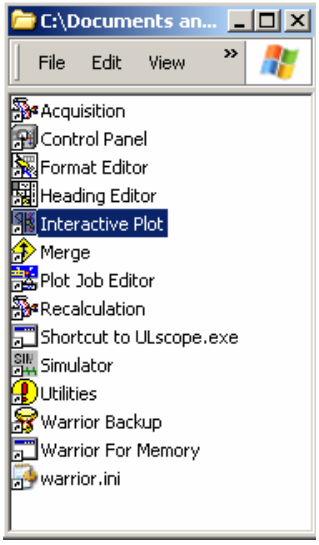


FIG: 8.6 Interactive Plot

FIG: 8.7 Select Action/Screen Plot

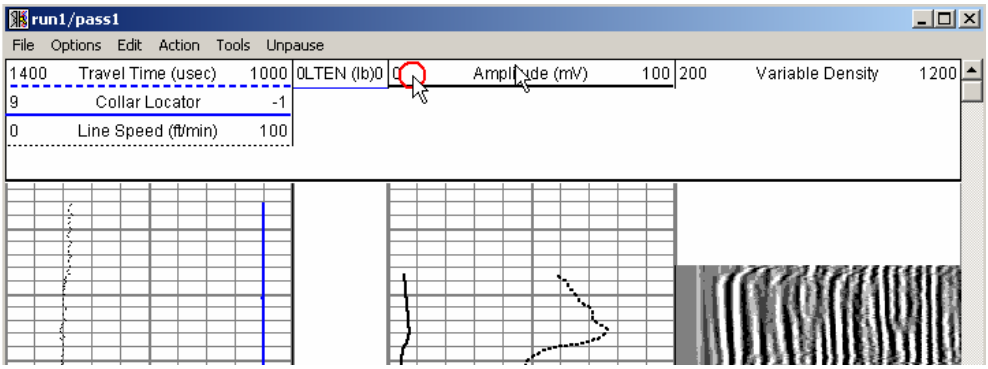


FIG: 8.8 Double Click over the header

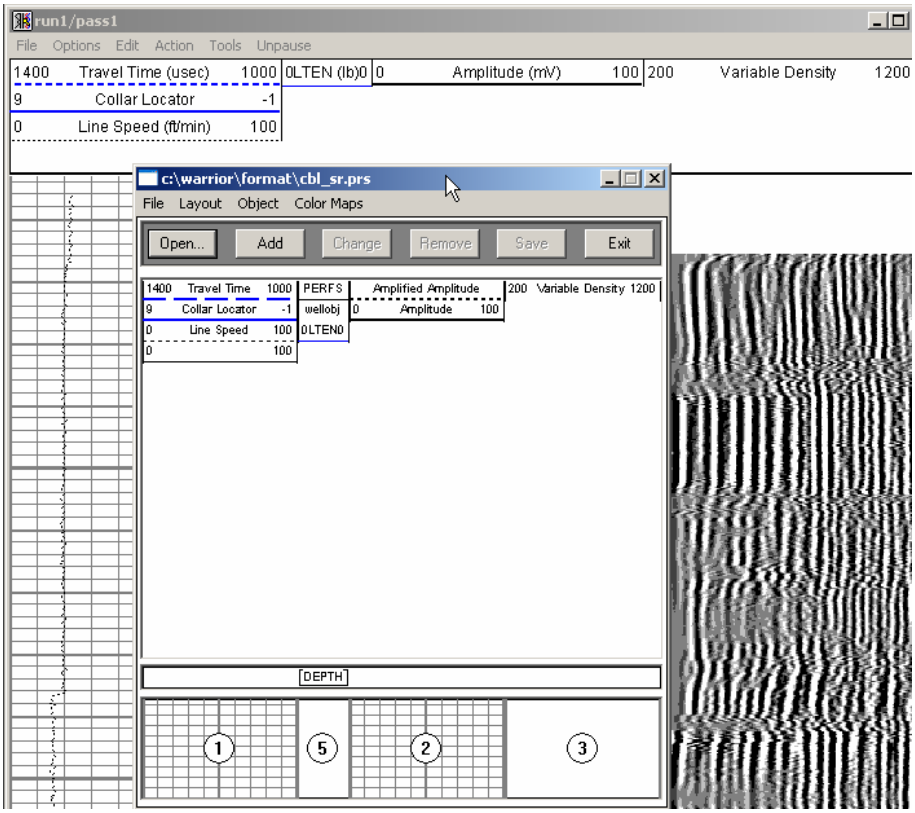


FIG: 8.9 Edit Presentation

8.1 File

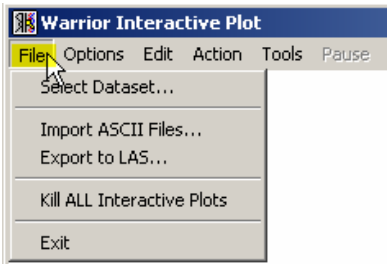


FIG: 8.10 File option

8.1.1 Select Dataset

Select Dataset from Database for specifically Log pass

8.1.2 Import ASCII Files

See Section 12.3.1 Read ASCII data into Warrior

8.1.3 Export to LAS

See section 12.1.1 Export to LAS Format.

8.2 Options

Allows selection of various presentation options as shown below.

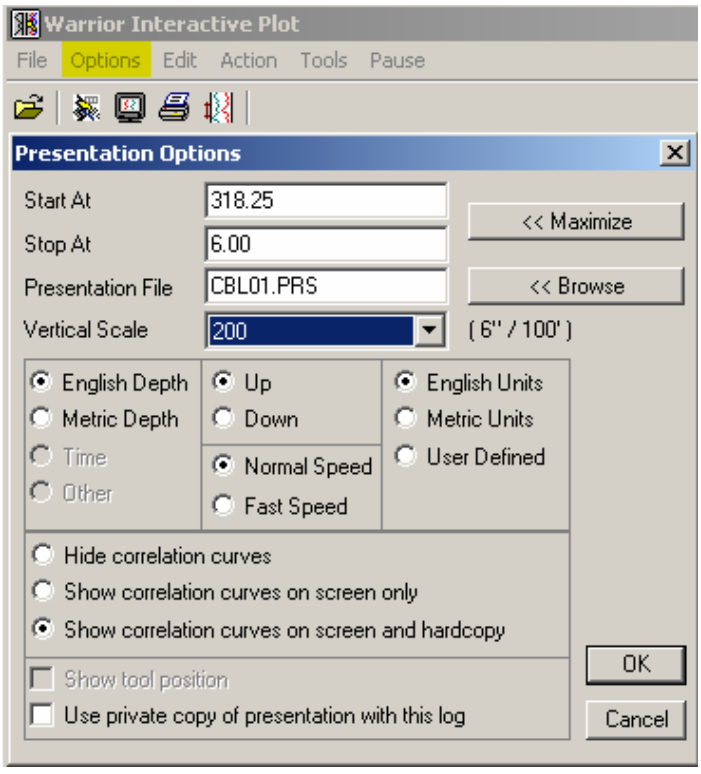


FIG: 8.11 Options

Start and Stop depths can be selected or the full range of the database can be selected using the **Maximize** button.
Alternative presentation files may be selected using the **Browse** button, which brings up a standard file selection box. Warrior log format information is contained in individual files with a prs extension. These files are created or edited using the Log Format Editor program.
Note that a selection can be made to **Use a private copy of presentation with this log**. This embeds the current presentation file in the database so that the database can be archived complete with its presentation or sent to other Warrior systems without having to remember to send the presentation file along with it. Also, if the presentation is embedded and it is subsequently edited from Interactive Plot, the edit will only take place on the embedded copy, not on the original file. **English** or **Metric** depth units may be selected, or **Time** can be used as a reference. The log may be plotted **Up** or **Down**. The log data units may be selected as **English** or **Metric**, or you may define a hybrid system. The **User Defined** units setup is done from with the **Control Panel**. Whenever a parameter in the Options window is changed, the current log screen plot(s) will be redrawn with the new option.

Warning! When an option is changed, ALL interactive plots are redrawn. This can be a heavy load on the computer if a large number of CBL-VDL plots are currently on the screen and with a slow machine it may look as though the system has halted.

Select the depth to Start/Stop to Plot the LOG

Select presentation from the Warrior\Format (directory).

Select Vertical Scale by default is 1:240 (5” = 100’) or (1’ = 240 ‘)

8.3 Edit

8.3.1 Log Format

Provides rapid access to the Log Format Editor. When the Format Editor is invoked from Interactive Plot, changing the log format and saving it causes the active screen plots to be replotted with the new format. Note that many screen plots may be overlaid on each other at any one time. If a large number a plots are present, a noticeable delay will occur while all are replotted.

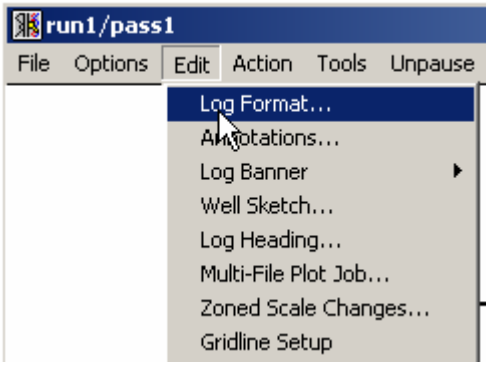


FIG: 8.12 Log Format

8.3.1.1 File

The Format Editor allows the creation and editing of the log presentation or format files. The outputs of the format editor are files of the type (*.prs), which are subsequently used to control all aspects of the log format.
The Format Editor may be started from its icon in Warrior shortcut folder, from the **Edit** menu of the Acquisition or Recalculation modules, from the **File** menu of the Presentation Plot module, or from

the **Action** menu of Interactive Plot. In addition, double-clicking in the scales area of the Interactive Plot window will also start the Format Editor.
When started from Warrior shortcut folder or from Presentation Plot, the Format Editor window appears as shown below, i.e. with no presentation available for edit. If started from the Acquisition, Recalculation or Interactive Plot modules, the log format currently being used will be presented.

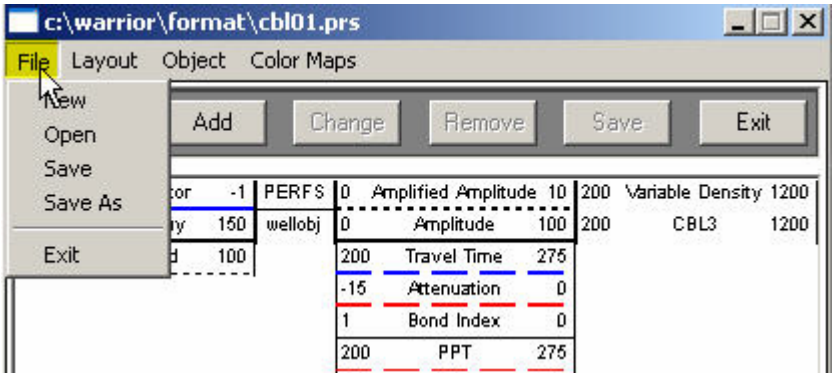


FIG: 8.13 File

8.3.1.1.1 New

If a log format is currently selected for editing, **New** clears the editor for a new log format.

8.3.1.1.2 Open

Displays a file selection window showing all the presentation files, currently available, within the system. The operator can select the presentation file to be edited. Note that all presentation files are to be found in the \warrior\format directory and have a (*.prs) extension.

8.3.2 Layout

Allows selection of the log grid layout from a selection, supported within the logging system.
The Warrior system is delivered with most standard layouts included. If you require a grid layout that is not available within layouts select **Edit Layout** to construct your own.

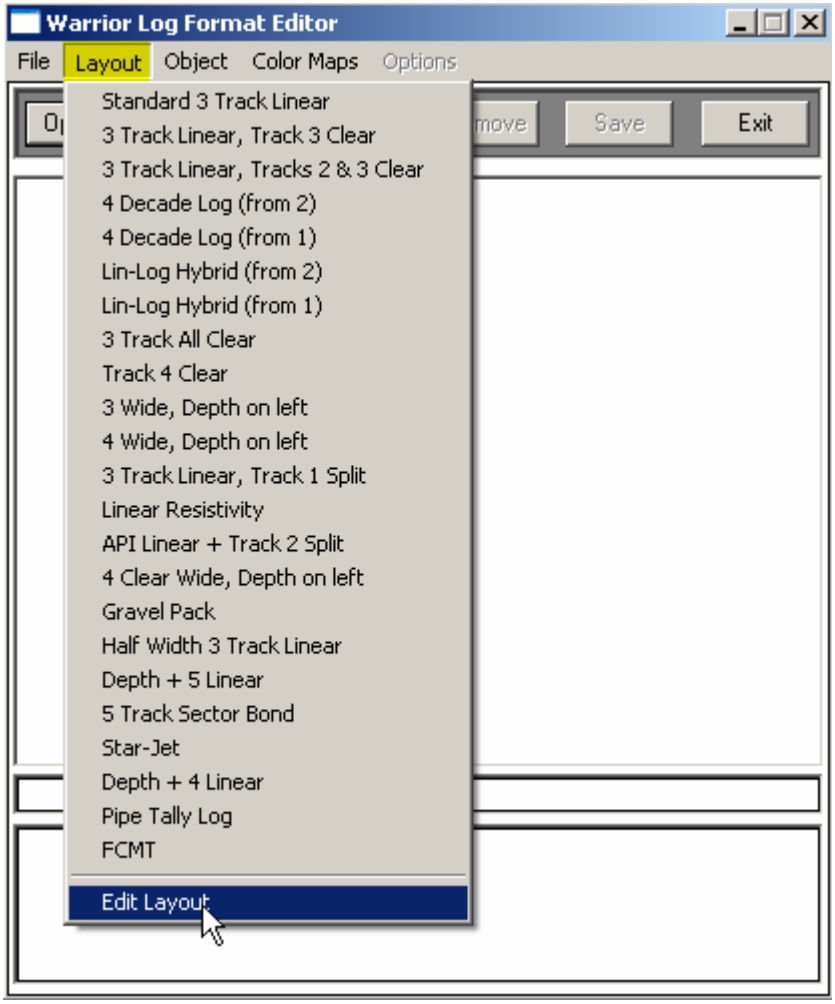


FIG: 8.14 Layout options

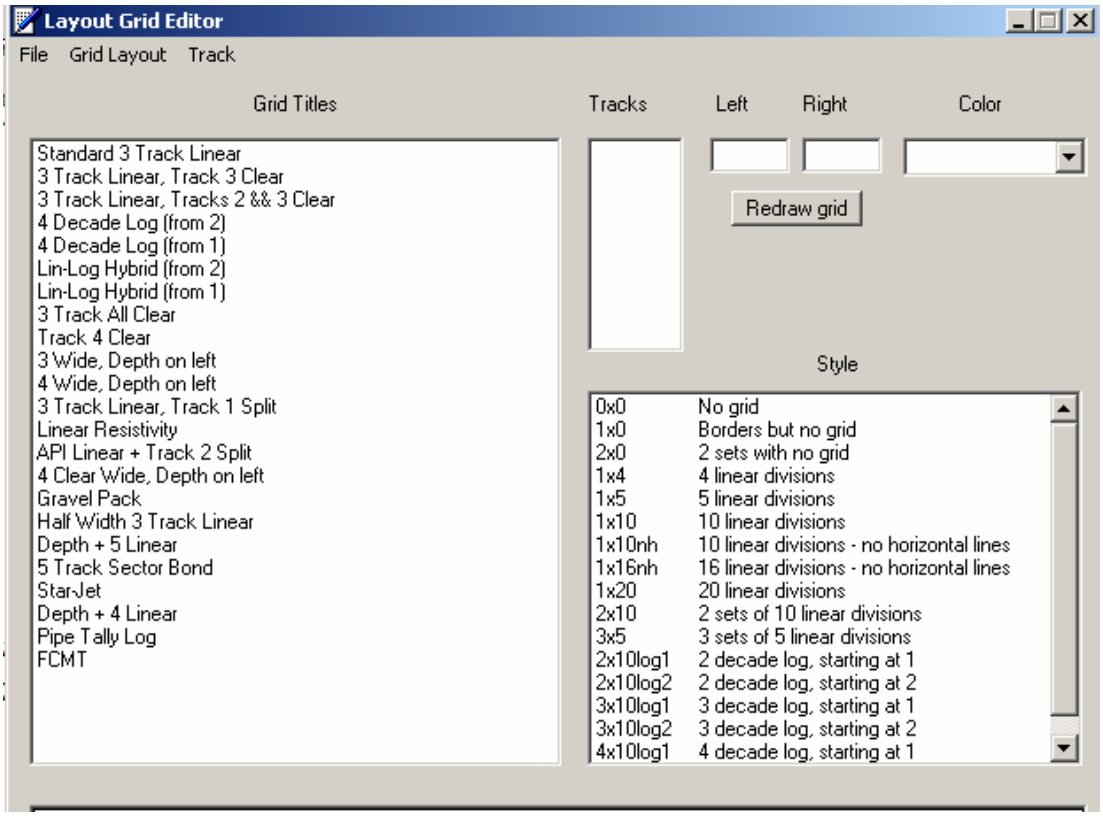


FIG: 8.15 Layout Editor

8.3.3.1 OPEN

Select Database for Format presentations.

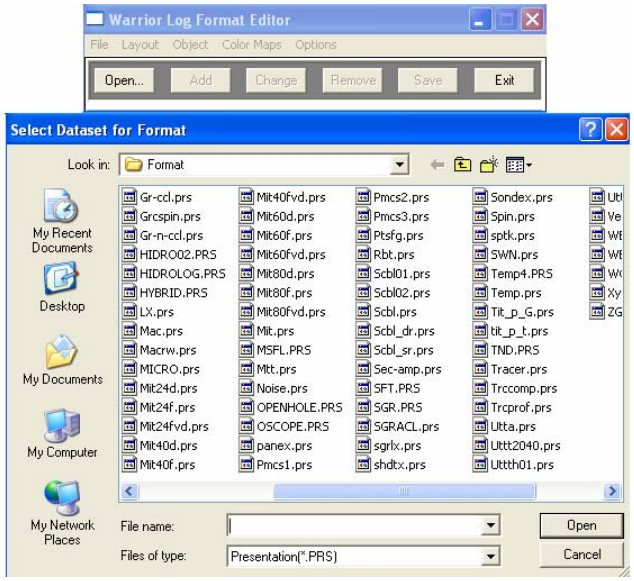


FIG: 8.16 Select Presentation

Select **Object** / **Add Data** or click the **Add** button.

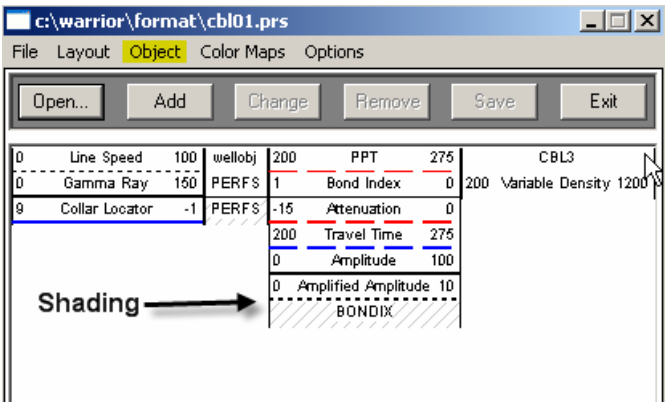


FIG: 8.17 Object

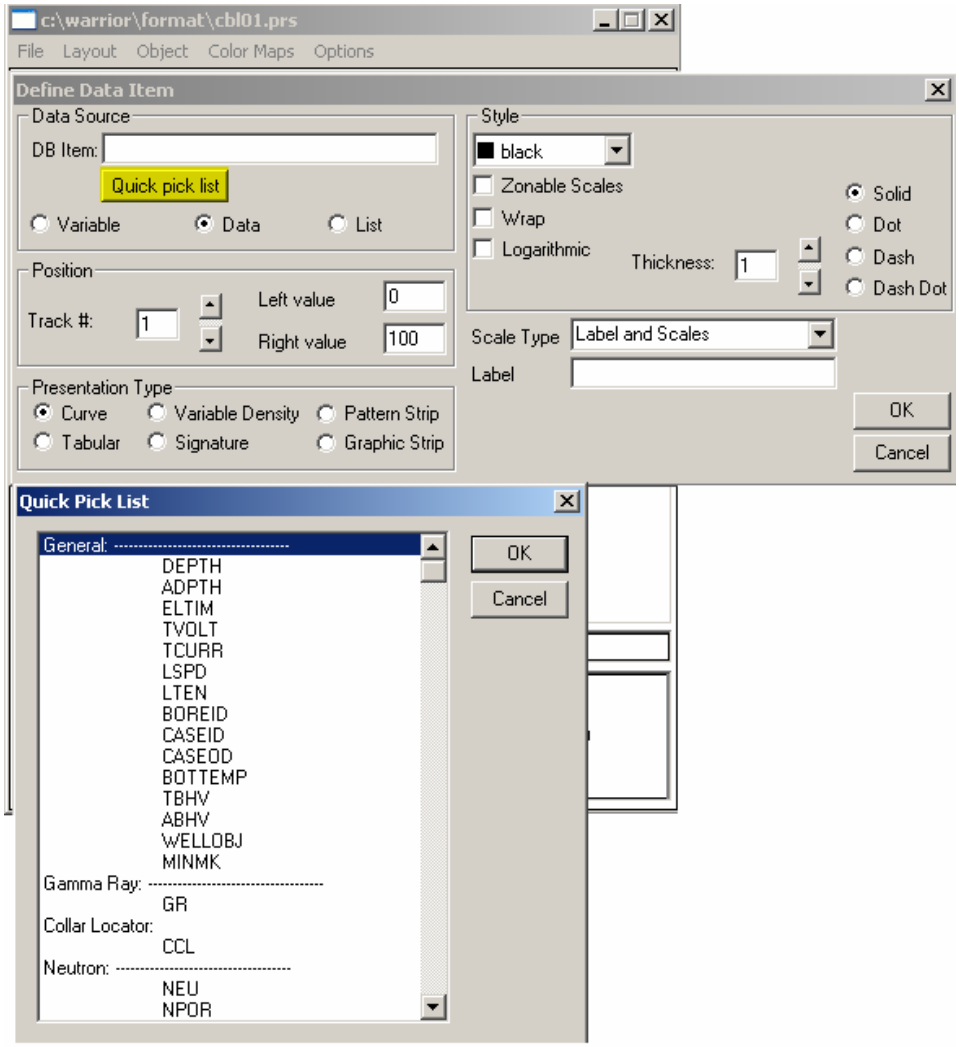


FIG: 8.18 Select Curve

8.3.3.2 Data source

Define the **Data Source**. Select the **DB Item** by using the **Quick Pick list** button or by typing the item name directly into the **DB Item** field.

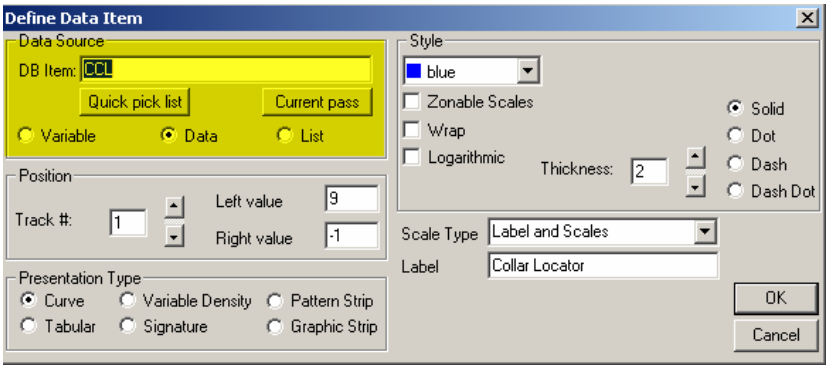


FIG: 8.19 Select Curve

Not all database item names are available from the **Browse** button. In a given service, use Monitor/Outputs to see all curves, or Edit/Variables to see all variables.
Define the data item as a **Variable** or a **Data** (curves, waveforms, etc.), using the radio buttons so marked.

8.3.3.3 Position

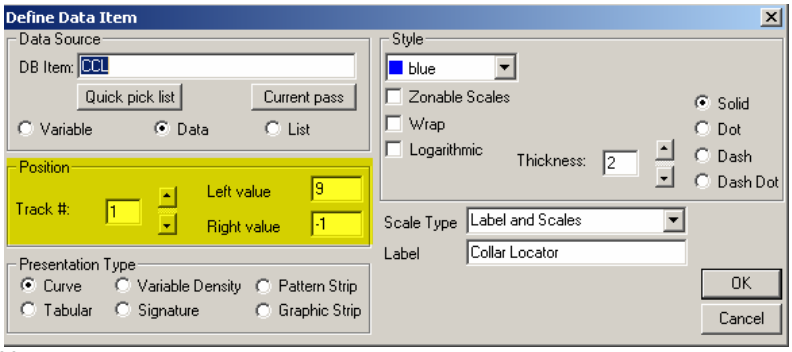


FIG: 8.20 Set Position

Define the track, where the curve is to be presented, by typing the track number directly into the **Track** # box or by using the arrow buttons. The track numbers are indicated in the power section of the main Format Editor window.
Define the **Left value** and **Right value** of the curve.

8.3.3.4 Presentation Type

Define the **Presentation Type**. Depending on the **Presentation Type** chosen, the right hand side of the Define Data Item window, or **Style** section, will present different options.

8.3.2.4.1 Curve

Define color (for color graphics devices only). If required, select **Wrap**. Causes infinite left and right backup curves to be presented.
Selecting wrap causes backup traces to be generated, however the backup scales are not labeled, nor is there any control over the trace thickness or coding. Adding another curve with the same output name, but with different scales, etc., allows complete control of the attributes of the backup curve(s).

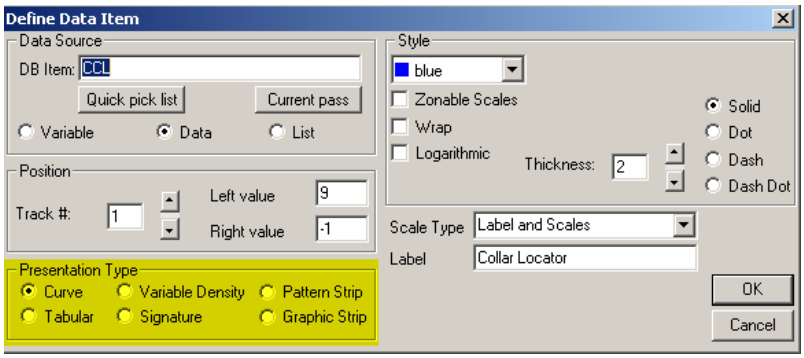


FIG: 8.21 Set Presentation Type

If required, select **Label**. Allows the standard database mnemonic in the log scales header to be replaced by a text string. For example, GR may be replaced by Gamma Ray. Enter the text string in the **Label** field.
If the curve is to be presented on a logarithmic scale, select **Logarithmic**.
Select the required curve thickness and curve coding.
Click the **OK** button.

8.3.2.4.2 Tabular

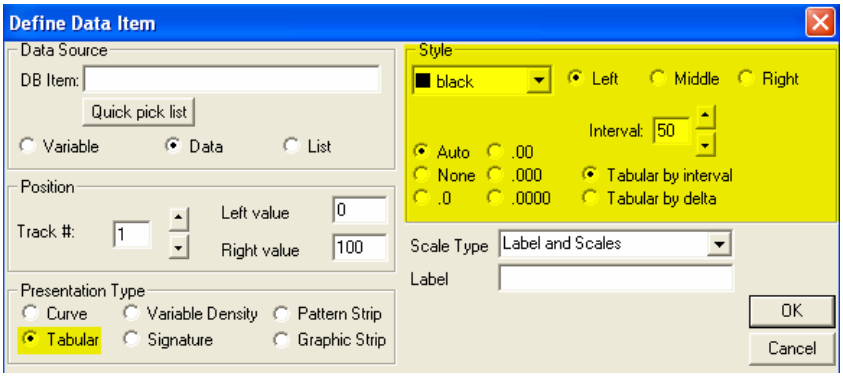


FIG: 8.22 Tabular Style

Define the position of the tabular number with the track, previously selected, as **Left**, **Right** or **Middle**. Define the required decimal point display.
Define the depth interval at which the tabular number is to be printed, i.e. every xx ft.
Note that the numerical depth, displayed in the depth column, is a tabular depth curve, and its presentation may therefore be modified in the same manner as any other curve.
Enter the required label for the log scales header in the **Label** field.
Click the **OK** button.

8.3.2.4.3 Variable Density

In the **Style** section, set the **VDL Black Level** and the **VDL White Level** parameters. These parameters set the level at which the (acoustic) waveform will appear as black or white on the log output. The normal range of the digitizer is plus and minus 5 volts. Therefore, with the levels set at 25% as shown below, any signal above 1.25 volts will appear black, and any below minus 1.25 volts will appear as white. The number of levels of gray, defined by the color map, is set evenly between these two limits.

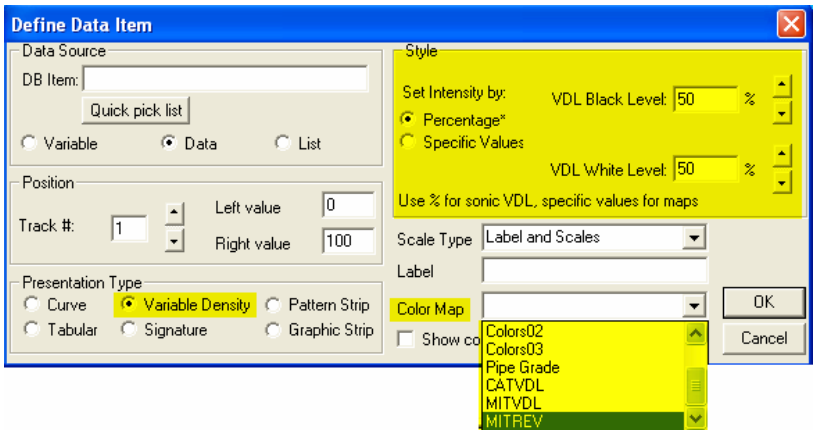


FIG: 8.23 VDL Style

Enter the required label for the log scales header in the **Label as** field.
Enter the name of the required Color Map in the **Color Map** field. The color map controls the number and appearance of gray shadings or colors used in the VDL presentation. Various color maps may be defined the in the Warrior.ini configuration file.
Click the **OK** button.

8.3.2.4.4 Signature

In the **Style** section, set the **Signature Height** and **Interval** parameters. The Signature Height sets the vertical (or y-axis) size of the waveform in inches of paper. As mentioned previously, the range of the digitizer is 10 volts peak to peak; therefore the Signature Height parameter normally corresponds to this range of raw waveform signal. The Interval parameter defines how often the waveform is printed on the output in feet or meters

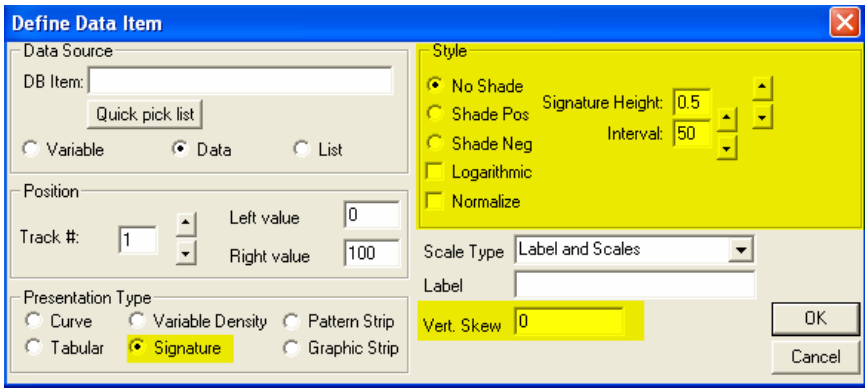


FIG: 8.24 Signature Style

In the **Style** section, set the **Signature Height** and **Interval** parameters. The Signature Height sets the vertical (or y-axis) size of the waveform in inches of paper. As mentioned previously, the range of the digitizer is 10 volts peak to peak; therefore the Signature Height parameter normally corresponds to this range of raw waveform signal. The Interval parameter defines how often the waveform is printed on the output in feet or meters.
Choose:
No Shade or Shade Pos. or Shade Neg.
Select Normalize and/or Logarithmic, if required. Normalize amplifies the maximum peak to peak reading of each waveform to the maximum set by the Signature Height parameter. Logarithmic displays the waveform on a logarithmic vertical scale.
Enter the required label for the log scales header in the Label field.
Click the **OK** button.

8.3.2.4.5 Pattern Strip

Pattern Strip is a curve presentation, similar in appearance to a VDL, except that it has only one value at a given depth. For example, a Gamma Ray curve might be represented as a narrow track, where high values of gamma ray were shown as black and low values as white, with intermediate values shown as varying shades of gray.

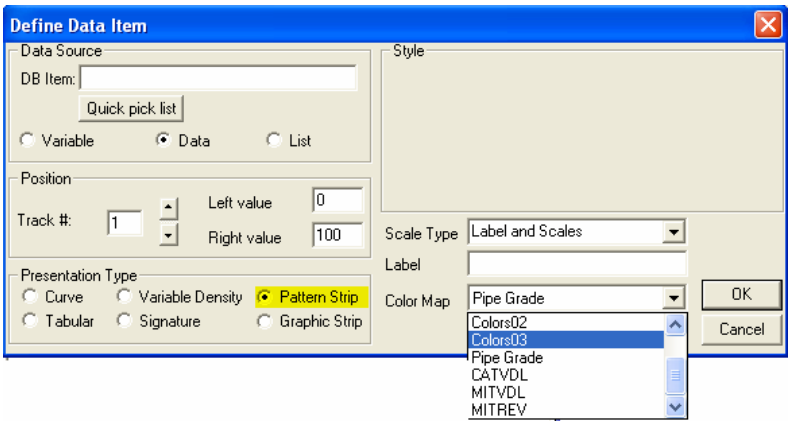


FIG: 8.25 Pattern Strip

Select **Label** in **Scale Type** if a user defined **Label** is to be used.
Enter the desired curve label in the **Label** field.
Define the **Color Map** in the same way as a VDL presentation.
Click the **OK** button.

8.3.3.5 Add Shading

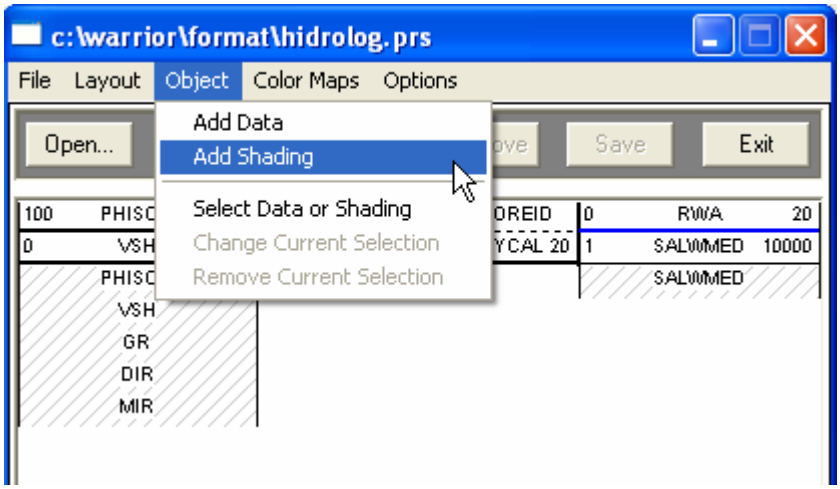


FIG: 8.26 Add Shading

Click on **Object/Add Shading**. A dialog box appears as shown below.
In the **Left Boundary** section, enter the name of the curve, with which the shading is associated.
If it is desired for the left boundary of the shading to follow the curve, select **Follow Curve**. If it is desired for the left boundary of the shading to follow a constant value, select **Constant** and enter value of the constant in the units of the associated curve. In the **Right Boundary** section, repeat the steps above. Select the required shading pattern by clicking on the pattern itself, and select the color

by choosing from the list in **Foreground**. If you wish the grid to show through the shading, click on **See Through**.

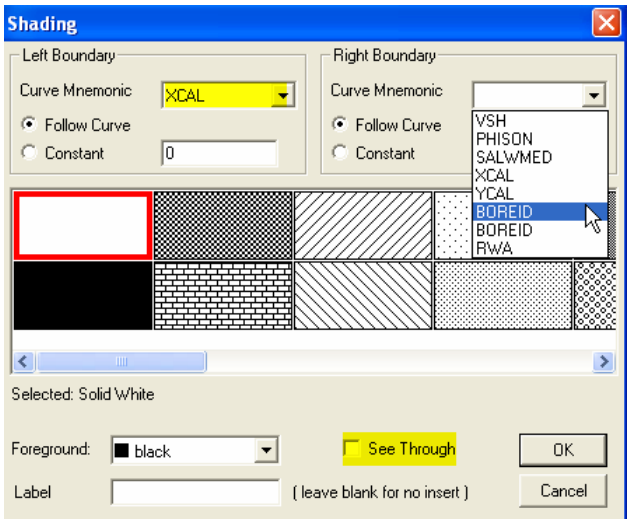


FIG: 8.27 Shading

Warning!

To see more patterns, left-click and hold the mouse on a pattern, then move the mouse to the right or left. The patterns will then scroll, showing more of them. Click the **OK** button.

8.3.3.5.1 Change & Remove Shading

Click on **Object/Select Data** or **Shading**. A list of the objects is presented.

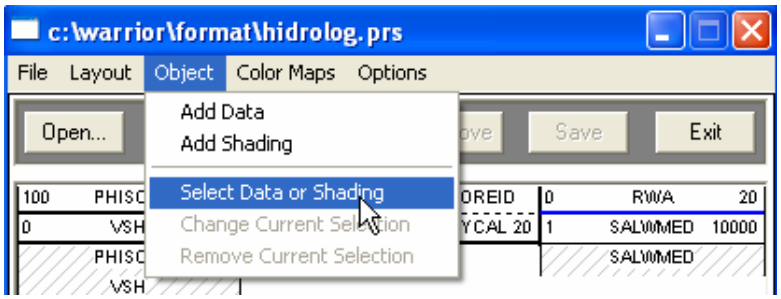


FIG: 8.28 Select Data or Shading

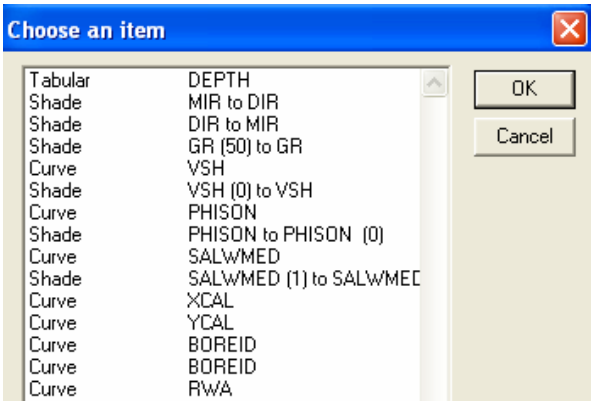


FIG: 8.29 Chose an Item

Double-click on the object to be changed, the window disappears, and then click on the Change button. The shading setup window appears as before, allowing changes to be made.
A shading object may be similarly removed by clicking the Remove button, once the object has been selected.

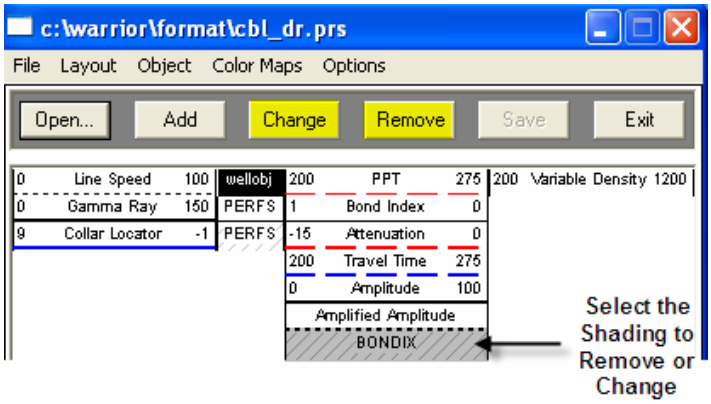


FIG: 8.30 Remove & Change Shading

Currently, there is no possibility to identify which curve is selected when a curve is presented more than once (e.g. multiple curves with different scales). In a CBL, for example, if AMP3 is resented twice on the log, then AMP3 will appear twice in the list of plot objects. The only way of distinguishing them is by trial and error, or that, when curves are added by the format editor, they appear at the bottom of the object list. So if AMP3 (scale 0 to 100) was added first, it will appear above AMP3 (scale 0 to 10) in the object list. Of course, when looking at an existing log format, this method cannot be used to distinguish them.

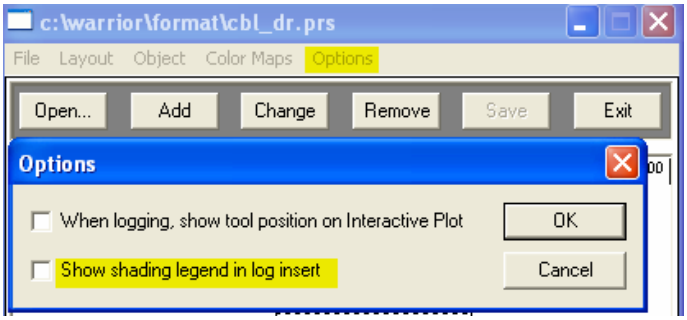


FIG: 8.31 Show Shading

Show the shading in the header ON/OFF

8.3.3.6 Enable Curves For Zone Scaling

Occasionally it is required to alter the plotted scales of a curve in different zones. This can be achieved by selecting the **Zonable Scales** checkbox when defining a data item.
Select the curve that requires zone scales by highlighting it in the format editor and clicking the **Change** button.
Select the **Zonable Scales** option and the **ZSC Name** textbox appears in the bottom right hand corner. The default variable name can be overridden by entering a name in the ZSC Name box; in this case "GAMM" has been entered as an example.
Selecting the **Zonable Scales** option creates two new special types of variables in the dataset, in this case L_GAMM and R_GAMM. These can be zoned during Interactive Plot by selecting the **Zoned Scale Changes** option in the **Edit** menu:
Add a new Zone by clicking the **Zones** button and enter the depth at the change.

Multiple curves from the same DB item can have separate ZSC controls, e.g. when a main GR and a backup GR curve is available. Leave the **ZSC Name** blank for the main curve, but enter GRBU for the backup curve. This will still show two curves plotting from the DB item GR, but the ZSC editor will present L_GR, R_GR, L_GRBU and R_GRBU controls.
Note: a curve may be turned off over an interval by selecting its right and left scales to be equal over the desired zone.

VIDEO: 8.1 Master Log Format

8.3.3.7 Minute Marks

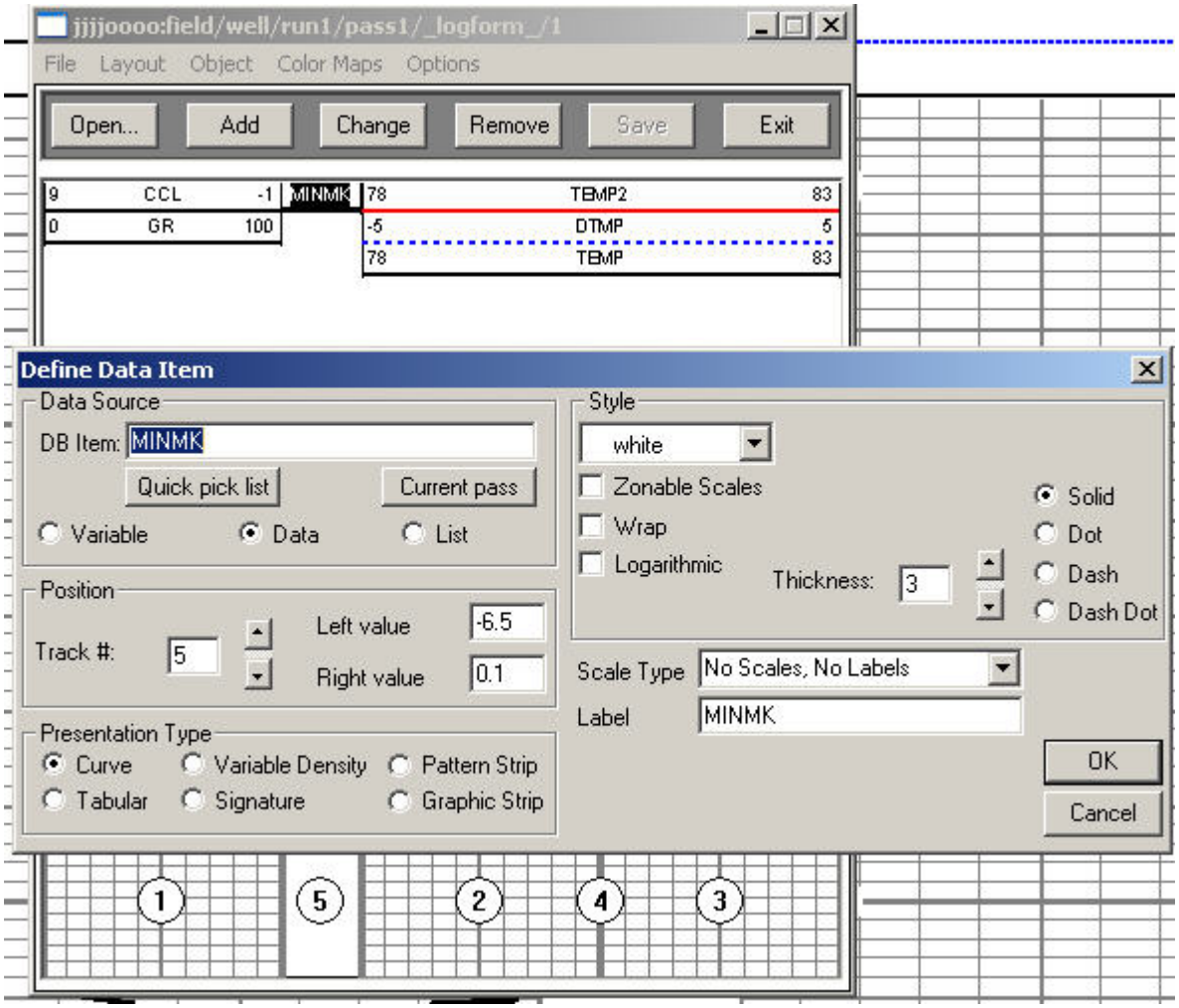


FIG: 8.32 Setup MINMK

Add MINMK curve and set the presentation.

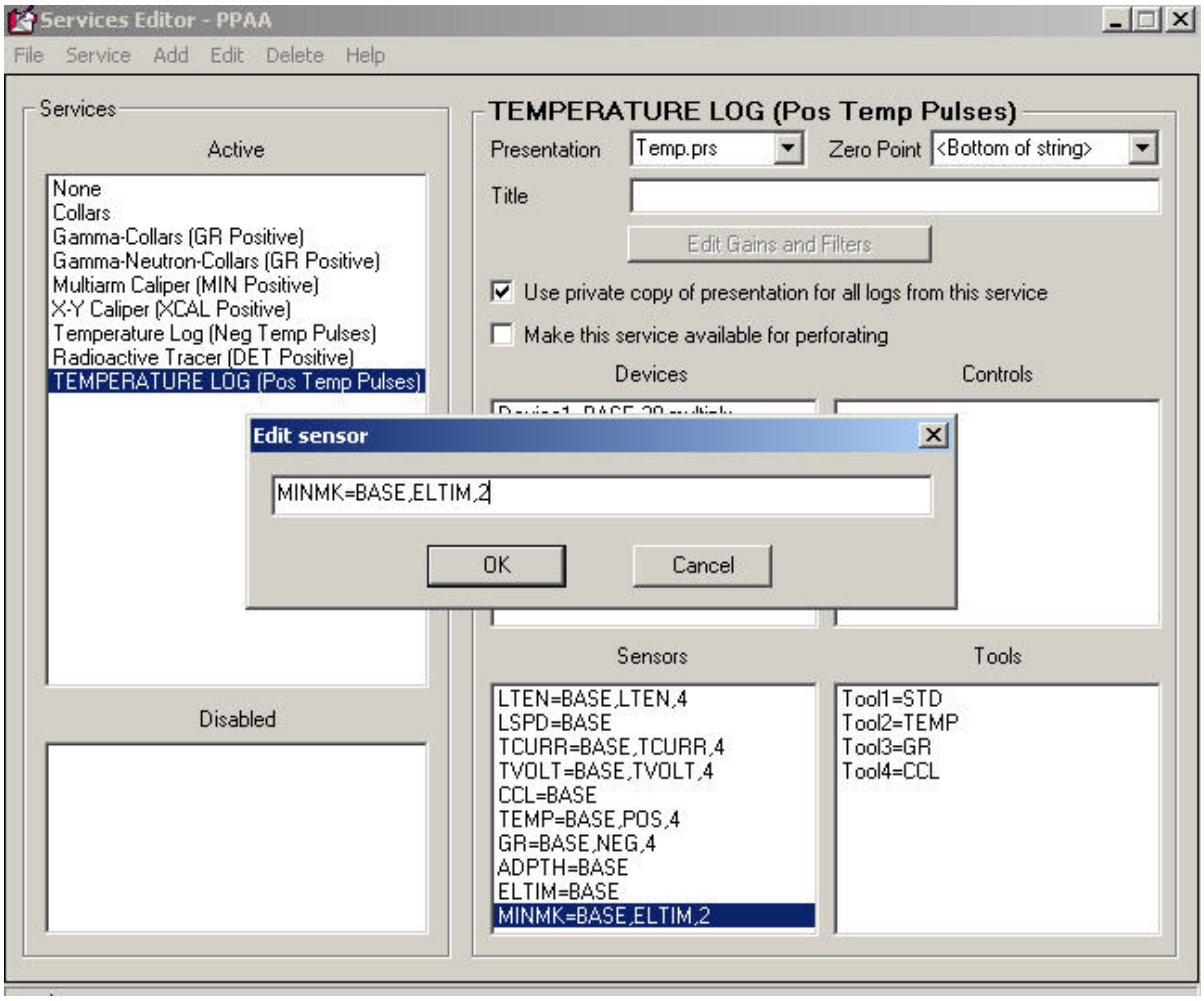


FIG: 8.33 Edit MINMK

In Utilities select Edit services Details and Edit Sensor

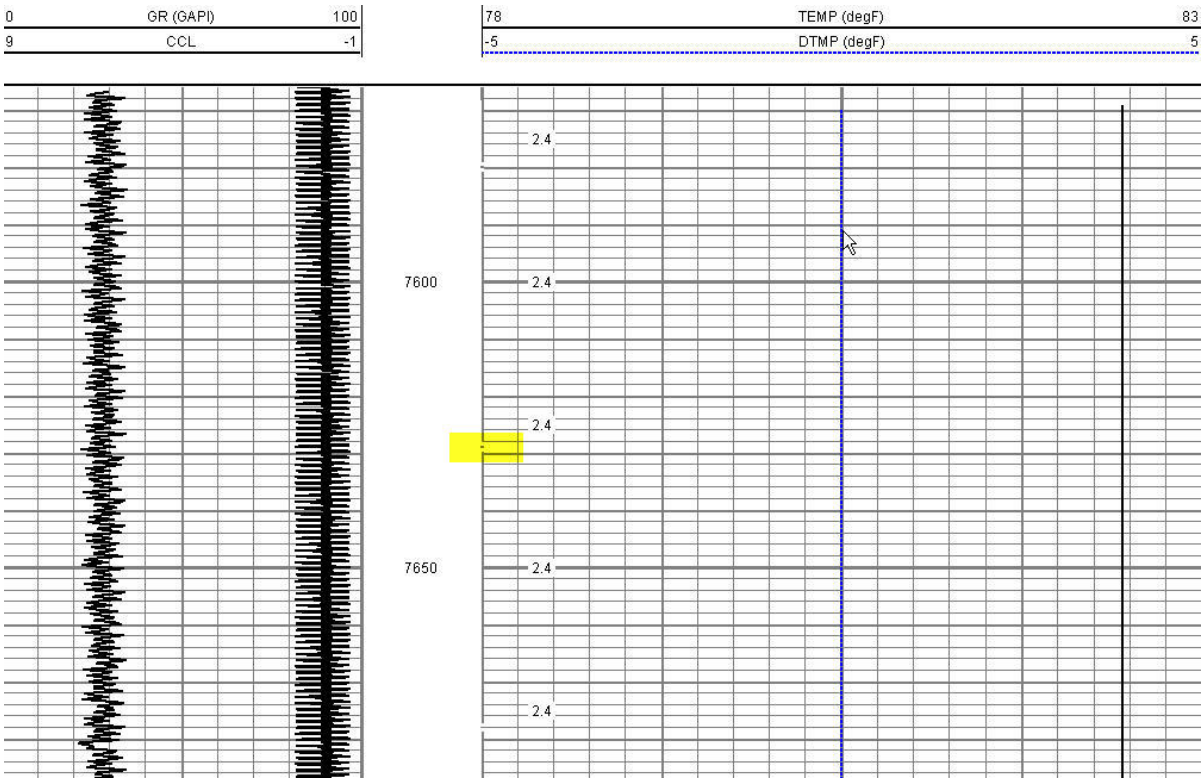


FIG: 8.34 Plot MINMK

8.3.4 Color Maps

In Warrior, there is a section labeled [Color Maps]. Color maps that are to be selected from the format editor are sequentially numbered under this heading.

Under each plotting device (including the SCREEN) the colors or shading for that device will need to be defined or that map will not print for that device.

For monochrome maps, the shading for a device is defined by the number of shades N, followed by N numbers with ranges from 0 to 255. 0 will be all black and 255 will be white. Grayscales=5, 0, 64,128,192,255

For color maps, the shading for a device is defined by the number of colors N, followed by N groups of three numbers. Each group of three numbers {R,G,B} are intensities of red, green, and blue. These numbers also must be in the range of 0 to 255.

Colors01=5,{0,0,255},{1,228,254},{2,253,97},{115,253,2},(255,255,0}.

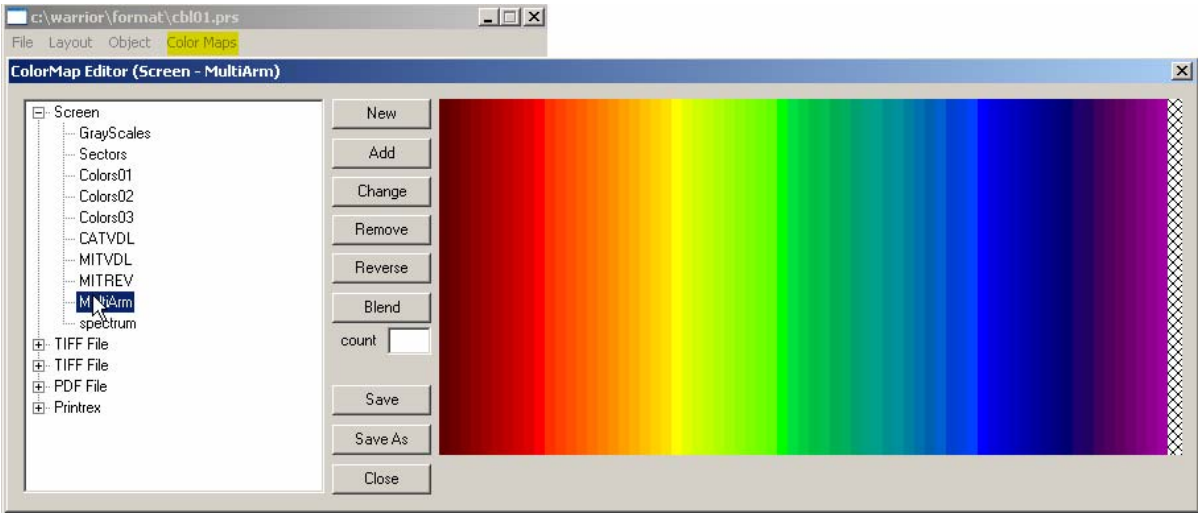


FIG: 8.35 Color Map

VIDEO: 8.2 Color Maps

8.4Action

8.4.1 Screen Plot

See section 9

8.4.2 Hardcopy

See section 9

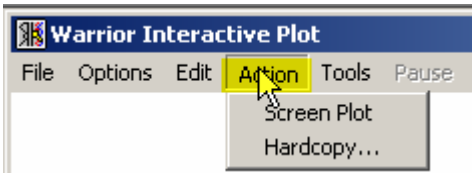


FIG: 8.36 Action

8.5 Tools

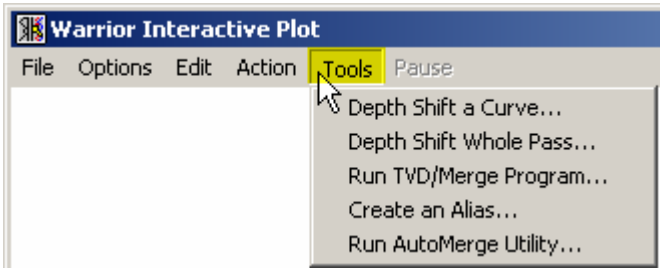


FIG: 8.37 Tools

8.5.1 Depth Shift a Curve

See section 12.4.2

8.5.2 Depth Shift Whole Pass

See section 12.4.1

8.5.3 Run TVD/Merge Program

See section 11.3

8.5.4 Create an Alias

See section 12.5.1

8.5.5 Run Auto Merge Utility

See section 12.5.2

8.6 Pause/ Unpause

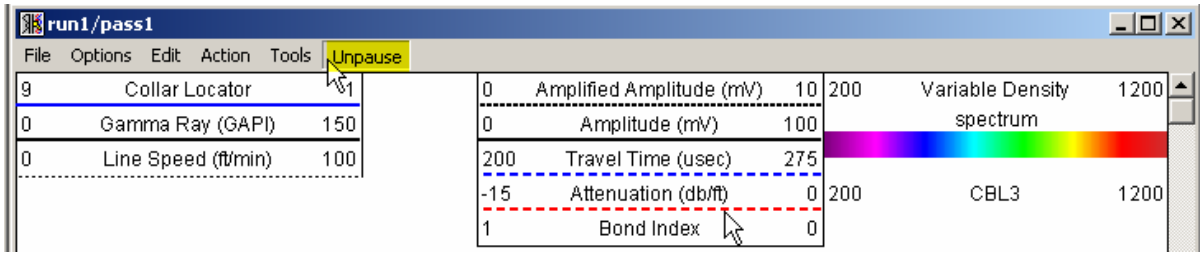


FIG: 8.38 Pause/Unpause

8.7 Annotations

Allow you to place annotations, curve labels and graphical objects on the log.

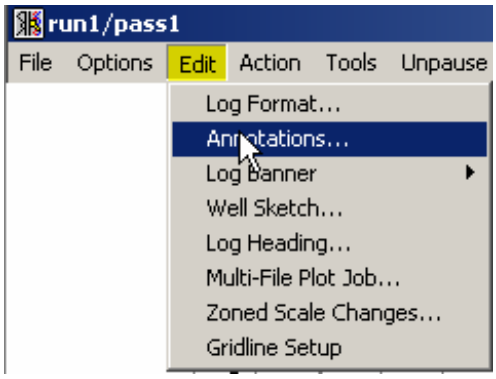


FIG: 8.39 Annotations

Scroll the log to the area where annotations are required and select **Annotate** from the Action menu. Note that annotations may be placed on the log even whilst logging. Simply 'Pause' the scrolling log, scroll back to the area where the annotations are to be inserted, place the required annotations and 'Unpause' to return to the current logging depth.

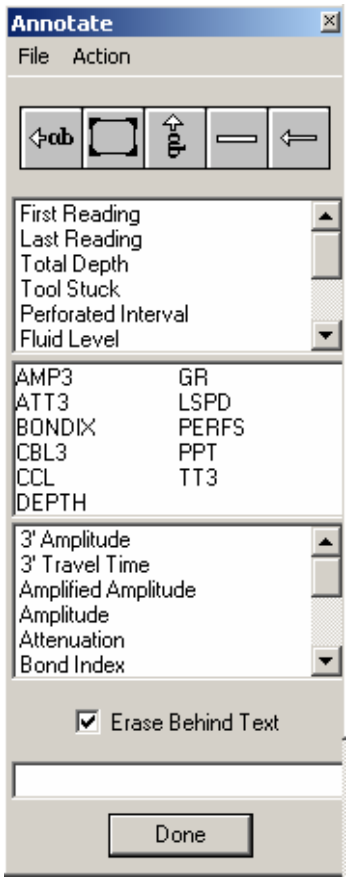


FIG: 8.40 Annotate

8.8 Log Banner

Ensure that the pass, to which the banner is to be attached, is selected in the active plot window. Select Edit/Log Banner, and if required a database and dataset.
Clicking on the File menu and clicking the Select can select the format of the Log Banner Format… option. There are a number of Log Banner formats (*.Wlb) to choose from. Select the most appropriate format and the edit the details by clicking on relevant areas within the window.

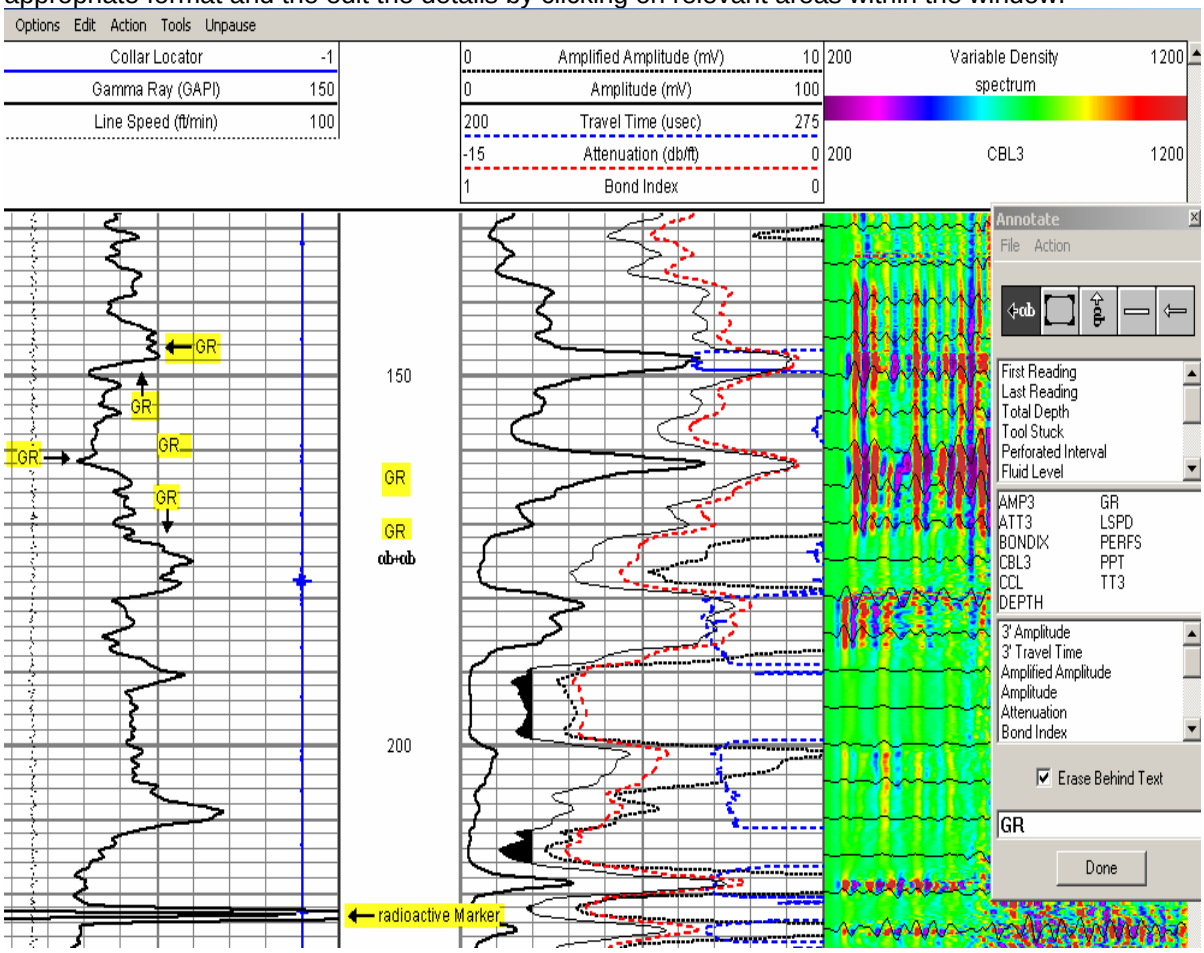


FIG: 8.41 Log Annotations

VIDEO: 8.3 Annotations

8.9 Well Sketch

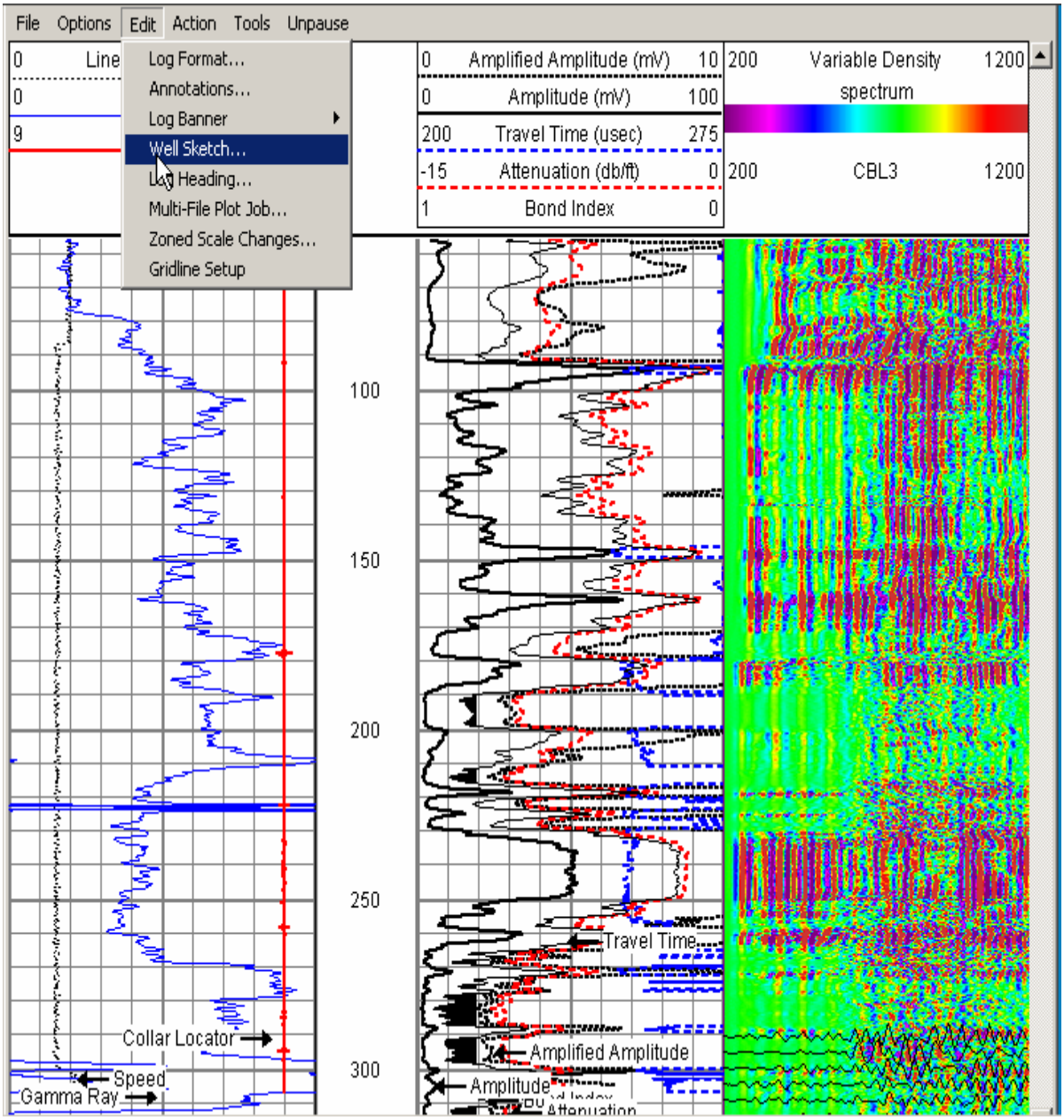


FIG: 8.42 EDIT\Well Sketch

Run Interactive Plot and select the dataset to accompany the well sketch. Click Edit/Well Sketch and the window, shown below, appears.

FIG: 8.43 EDIT \ Well Sketch

To add a new well object, select the object you wish to insert from the toolbar. A dialog window opens where the selected object's properties are defined.

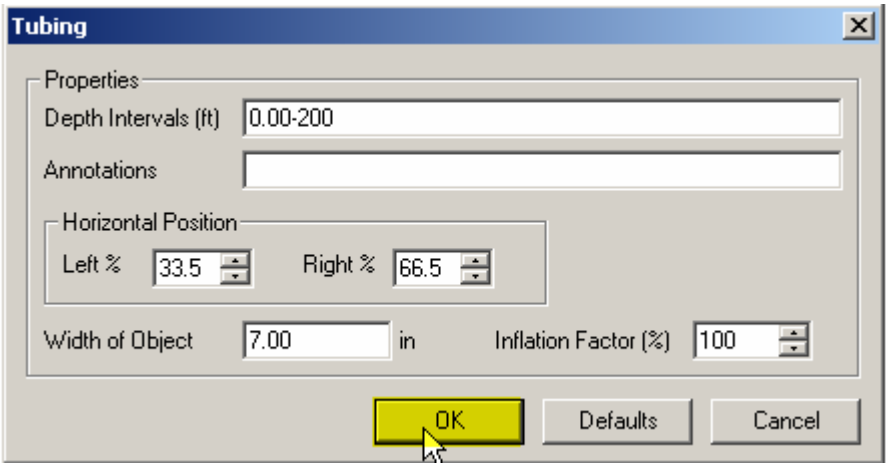


FIG: 8.44 Tubing Setup

Attachable' objects should be inserted first. Once these objects are added a list of 'attachable' objects is generated. Additional items can be added at this stage.
To edit or delete a well object, double-click on the object or press <Ctrl> and click to select more than one item. Right click opens the popup menu where the edit or delete options are available.
Selecting the area between the column headings and dragging to resize can change column widths. Columns can be sorted by clicking on the column heading.
Nipples & Packers, etc. can be added at a single depth, however if a well object appears at various intervals enter the depths and range in the **Depth Interval(s)** textbox, e.g. 0.00-200.
Continue adding objects until all required objects are entered, then save the well sketch by clicking **File/Save** or **Save As…**.

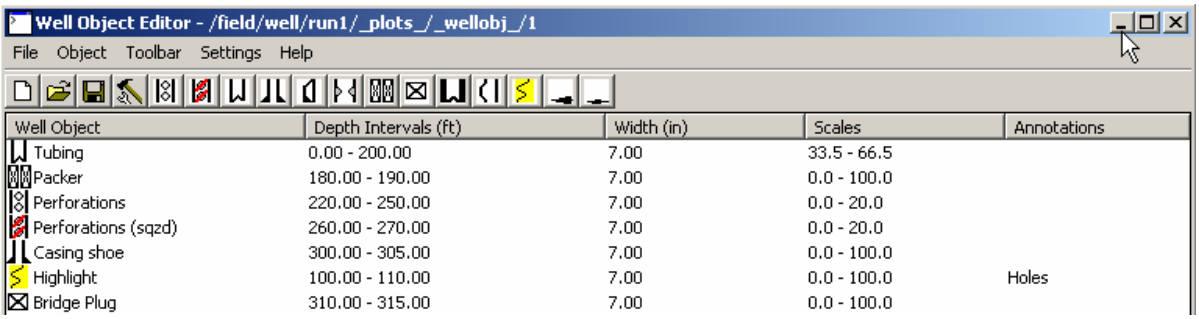


FIG: 8.45 Well Object Editor

8.9.1 Depth Intervals

The following are examples of valid depth intervals:
A semicolon or a space separates each depth interval. Top and bottom depths of one depth interval must be separated by a dash.

8.9.2 Annotations

You can automatically annotate your well object by typing in the annotation here. If the annotation is moved to a different position, it becomes a normal log annotation and will no longer show up here.

8.9.3 Vertical Position

The position of the well object is defined as a offset percentage from the left and right hand sides of the track. Values less than 0 and or greater than 100 will draw part of the object outside of its assigned track. A scale of -100 to 0 will place the object entirely outside of its assigned track at a width equal to the assigned track.

8.9.4 Width

The objects in the diagram will be drawn proportionally to each other. If a size is entered, then the left and right vertical position will be calculated to draw that object centered in the diagram. If the left and right scales are changed, the size will reflect the change.

8.9.5 Inflation Factor

The width * Inflation factor will be the actual size of the object drawn on the diagram. If the width is changed, the inflation factor is set back to 1 (100%).

8.9.6 Attaching Objects

If a bridge plug object is attached to a casing object, then the bridge plug scales and size will be fixed to the scales and size of the casing object. If the casing size and/or scales are changed, the bridge plug settings will reflect that change.

8.9.7 User Defined Metafiles

Any metafile can be used as a well object by placing the metafile in the 'Warrior\Format' directory with an extension of 'wwd'. The new object will be displayed on the toolbar with the same name as the file without the extension.

8.9.8 Metafile Properties

Metafiles can be displayed as either Fixed or Stretched. The fixed mode can display the graphic in its original proportions using three different methods. Center will center the object about the center of the interval. Top will start drawing the object at the top of the interval. Bottom will draw the object so the bottom of the object will be at the bottom of the interval. The stretched mode will stretch or compress the graphic to fit within the depth interval.

In order for the well sketch to appear on the log, open the Log Format Editor and Add a database item, called **wellobj**, to the log format.
Click the **Graphic Strip** radio button and select the track where the well sketch is to be presented.
In our example the result is as shown in Fig: 8.44

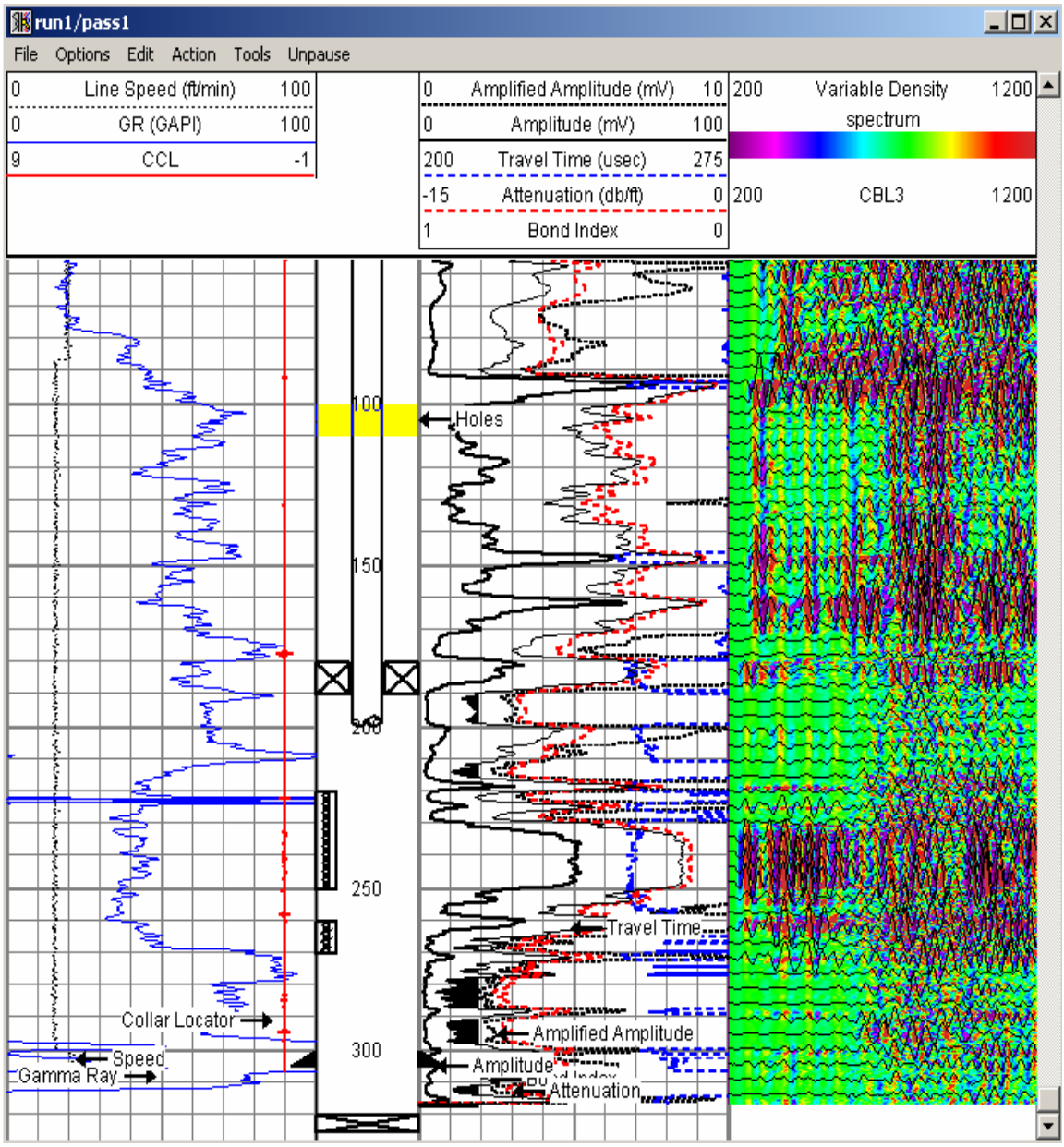


FIG: 8.46 Plot LOG

VIDEO: 8.3 Well Sketch Editor

Section

9

9 Interactive Plot

The Interactive Plot program is a program module that may be started by other Warrior programs, such as Acquisition or Recalculation. It may also be used independently to generate log plots on the screen or to the hardcopy device(s). It is also used for adding individual banners (inserts) and annotations (e.g. curve labels) to a log pass. Note that multiple copies of Interactive Plot may be running at the same time, such that the system may be plotting dataset A to the screen, dataset B to one hardcopy device and dataset C to a second hardcopy device.
Double-click the Interactive Plot icon in the Warrior shortcut folder or select **Action/Screen Plot** in Warrior Logging System

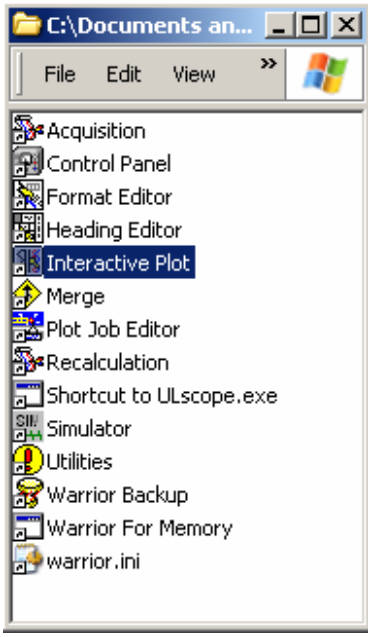


FIG: 9.1 Interactive Plot

9.1 File

Select Dataset

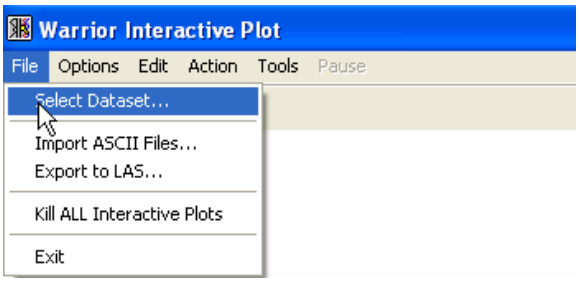


FIG: 9.2 Select Action/Screen Plot

9.1.1 Select Dataset

Select Dataset from Database for specifically Log pass
Selection of the database and dataset containing the data to be plotted. A standard Windows file selection box appears, see Figure 9.3 The required database is selected by double-clicking the selection, or highlighting it and clicking **OK**.

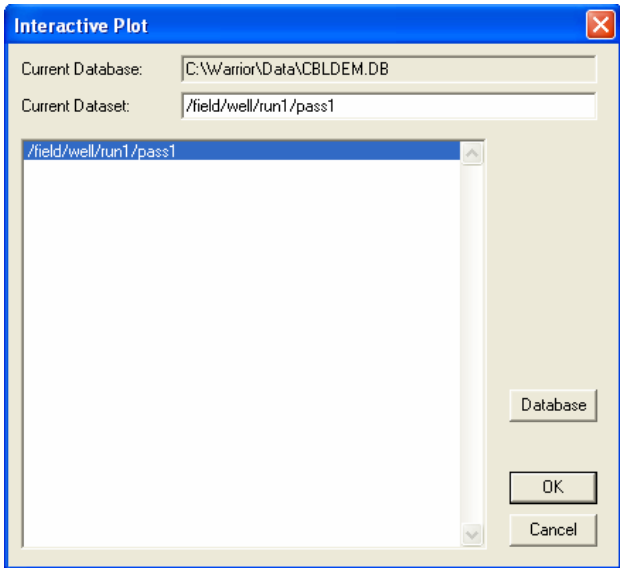


FIG: 9.3 Select Data Base

9.1.2 Import ASCII Files

See Section 12.3.1 Read ASCII data into Warrior

9.1.3 Export to LAS

See section 12.1.1 Export to LAS Format

From interactive plot select **Action->Screen Plot** menu. In addition double-clicking in the scales area of the interactive plot window will also start the Format Editor.

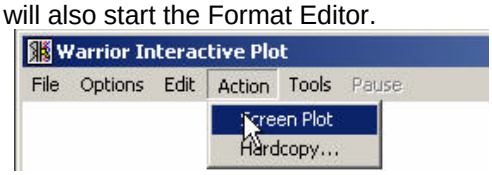


FIG: 9.4 Select Action/Screen Plot

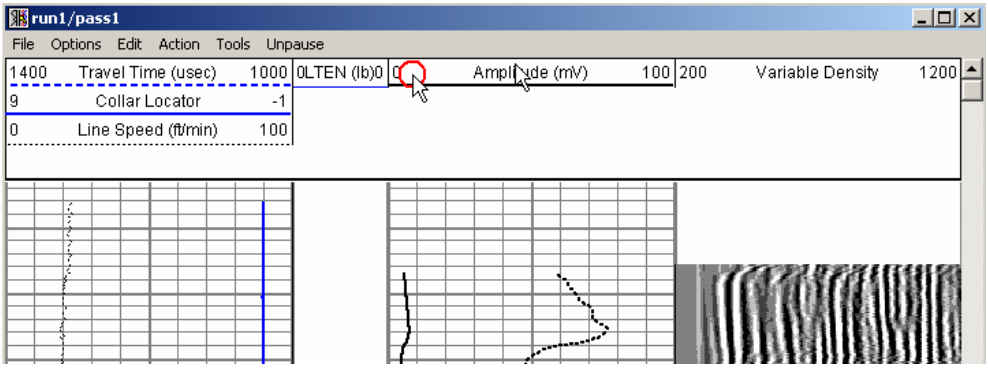


FIG: 9.5 Double Click over the header

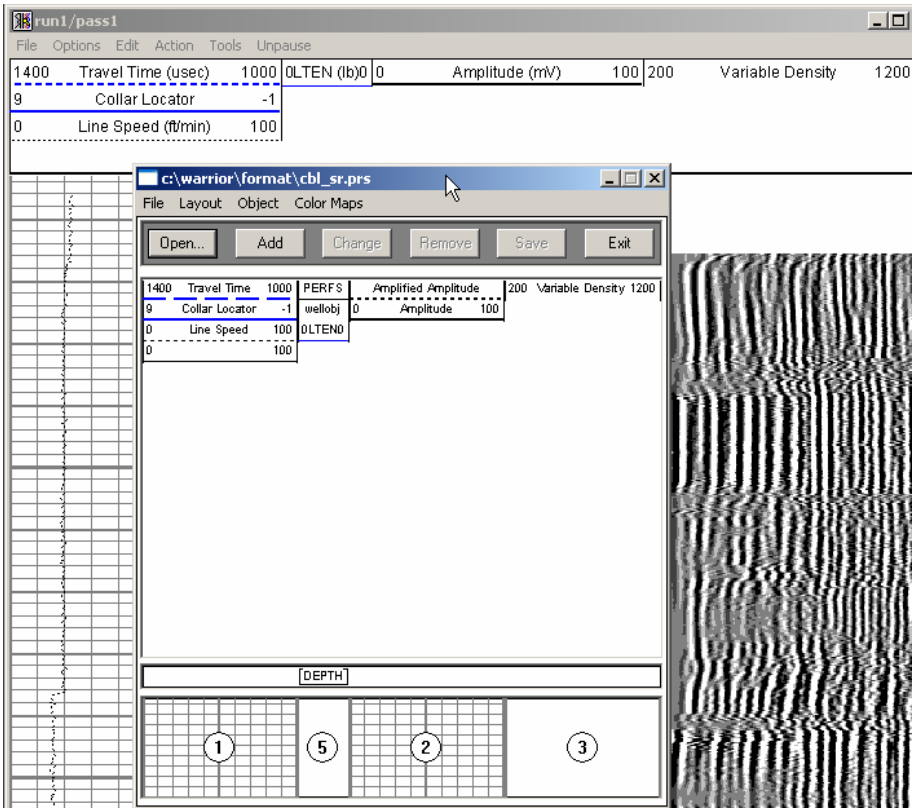


FIG: 9.6 Edit Presentation

9.2 Options

Allows selection of various presentation options as shown below.
Edit / Log Format…
Provides rapid access to the Log Format Editor. When the Format Editor is invoked from Interactive Plot, changing the log format and saving it causes the active screen plots to be repotted with the new format. Note that many screen plots may be overlaid on each other at any one time. If a large number plots are present, a noticeable delay will occur while all are repotted.

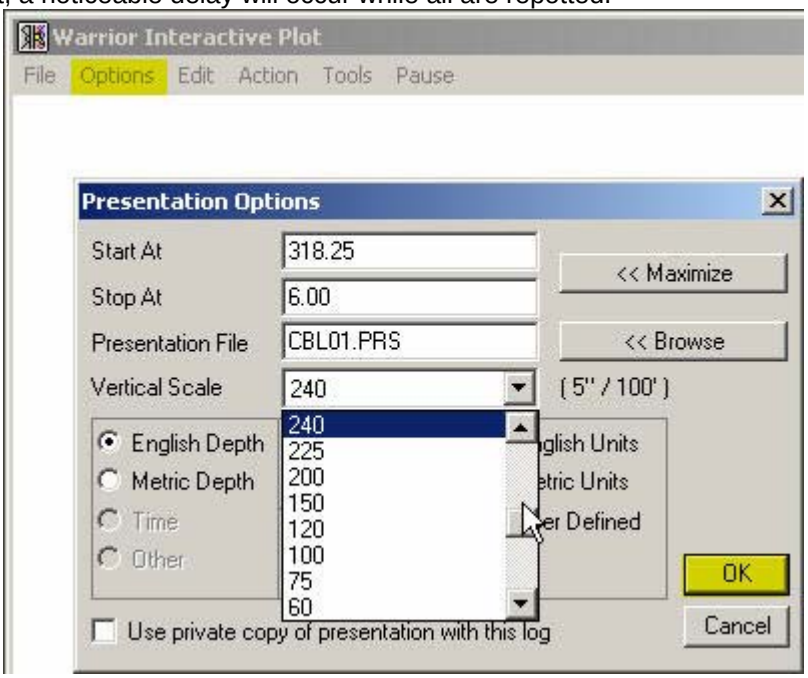


FIG: 9.7 Options

Start and Stop depths can be selected or the full range of the database can be selected using the **Maximize** button.
Alternative presentation files may be selected using the **Browse** button, which brings up a standard file selection box. Warrior log format information is contained in individual files with a prs extension. These files are created or edited using the Log Format Editor program.
Note that a selection can be made to **Use a private copy of presentation with this log**. This embeds the current presentation file in the database so that the database can be archived complete with its presentation or sent to other Warrior systems without having to remember to send the presentation file along with it. Also, if the presentation is embedded and it is subsequently edited from Interactive Plot, the edit will only take place on the embedded copy, not on the original file. **English** or **Metric** depth units may be selected, or **Time** can be used as a reference. The log may be plotted **Up** or **Down**. The log data units may be selected as **English** or **Metric**, or you may define a hybrid system. The **User Defined** units setup is done from with the **Control Panel**. Whenever a parameter in the Options window is changed, the current log screen plot(s) will be redrawn with the new option.

Warning! When an option is changed, ALL interactive plots are redrawn. This can be a heavy load on the computer if a large number of CBL-VDL plots are currently on the screen and with a slow machine it may look as though the system has halted!

Select the depth to Start/Stop to Plot the LOG

Select presentation from the Warrior\Format (directory).

Select Vertical Scale by default is 1:240 (5” = 100’) or (1’ = 240 ‘)

Exit
Closes the currently selected Interactive Plot.

Annotations…
Allow you to place annotations, curve labels and graphical objects on the log.

9.3 Annotate the LOG

Scroll the log to the area where annotations are required and select Annotate from the Action menu. Note that annotations may be placed on the log even whilst logging. Simply 'Pause' the scrolling log, scroll back to the area where the annotations are to be inserted, place the required annotations and 'Unpause' to return to the current logging depth.

9.4 Create a LOG Banner (Insert)

Ensure that the pass, to which the banner is to be attached, is selected in the active plot window. Select **Edit/Log Banner**, and if required a database and dataset.

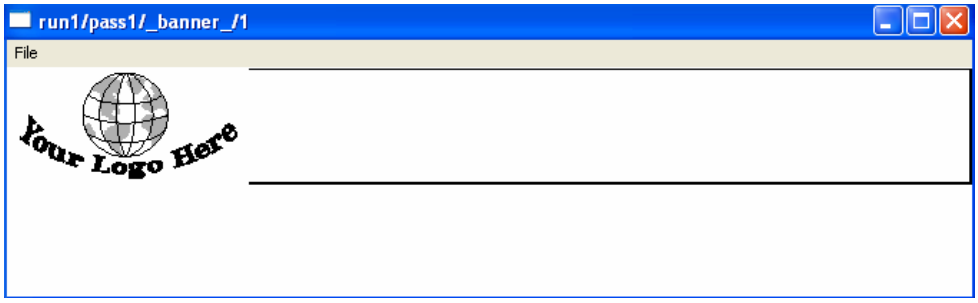


FIG: 9.8 Log Banner Insert Window

Clicking on the File menu and clicking the Select Format option can select the format of the Log Banner. There are a number of Log Banner formats (*.Wlb) to choose from. Select the most appropriate format and the edit the details by clicking on relevant areas within the window.

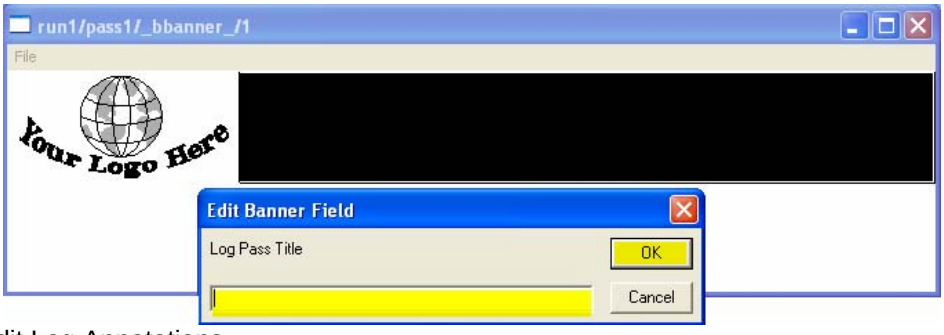


FIG: 9.9 Edit Log Annotations

9.5 Screen Plot

Select a database and dataset Go to Options and select the depth interval, plot presentation, etc.. Go to Action and select Screen Plot. The log will appear as below.
The plot may be paused by using the **Pause** button and terminated by reselecting **Screen Plot**. The plot may be paused at any time and the scroll bar, used to move back through the log to any zone of interest. When moving the scroll bar, the actual log depth, corresponding to the scroll bar position, is indicated in a box in the centre of the log plot window. A popup window opens by right-clicking on the plot, displaying all the curve's values at the mouse position
Note that the plot may be paused (or terminated) during logging without any loss of data, and subsequently returned to the current logging depth.
A plot may also be generated by directly selecting Screen Plot under the Action menu. A file selection box will be displayed.
Select a file in the standard Windows manner. If a presentation file is associated with the selected database, the plot will start immediately; otherwise a file selection box will be presented. Selecting a suitable presentation file will cause the plot to commence.
Presentations may also be selected under the **Options** menu at any time, as previously described.

9.6 Hardcopy

Generates a hard copy plot to Warrior supported scrolling plotters devices and any Windows supported printer/plotter. Hardcopy can also generate PDF and TIFF files of the log, simply select the required option from the pulldown list.

9.6.1 Plot a Hardcopy

To plot a hardcopy, select **Hardcopy…** from the **Actions** menu. The selection of the database file, the presentation file and other menu options are identical to those of the screen plot.
Selecting the **Hardcopy…** menu item brings up the following dialog box.

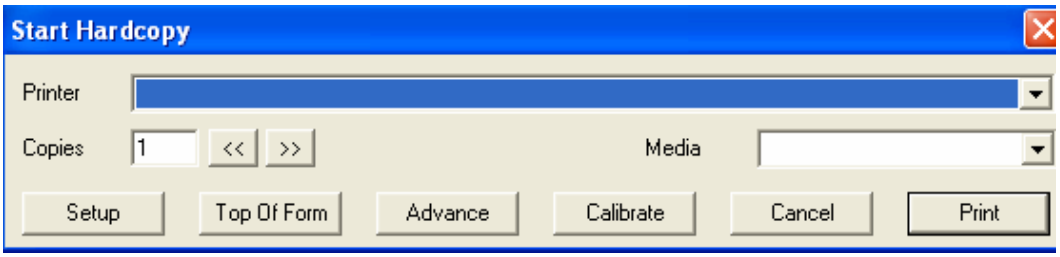


FIG: 9.10 Hardcopy dialog Box

There are normally several choices of printer. These include two classes of output. First, plotters supported by Warrior in the real-time scrolling mode, and second printers/plotters supported by Windows and installed on the system. Note that in the Windows mode, the output takes place in a paged manner, and that this mode is not suitable for use during logging.
The number of copies and the media selection, for those printers that support it, can be chosen here. For those printers that support fanfold paper, **Top of Form** moves to the next fold. On some printers this will skip a fold so that new plots will start on an outside page when folded.

9.6.2 Close the Current Plot & Select New Data

Click on the plot selection, e.g. Screen Plot, and the plot is terminated. New Database file and Dataset selection may be made from the File menu, and presentation and other options may be chosen from the Options menu.

9.6.3 Make a TIFF File

Install TIFF File as a Warrior printer with port name FILE: and driver None. You will be prompted for a file name for output.

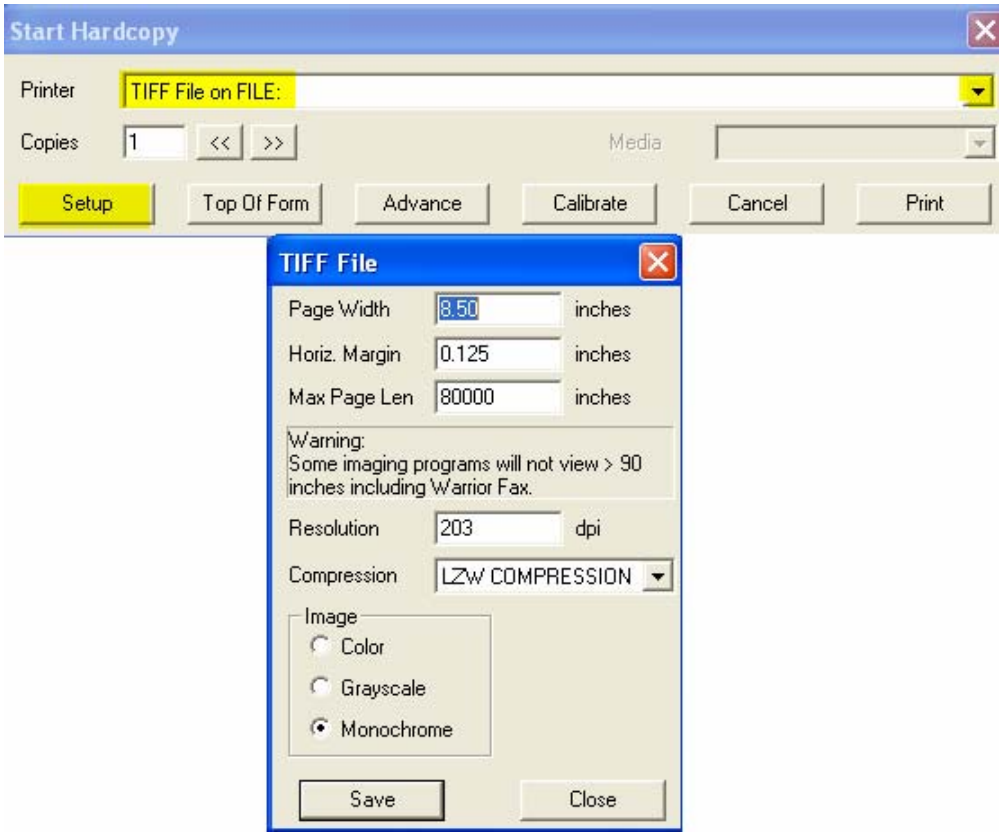


FIG: 9.11 Creating TIFF file

By clicking on the **Setup** button you can customize the page length, resolution and compression of the TIFF file.
This is an extremely useful feature that enables log presentations to be sent as e-mail attachments or used for presentation purposes as they can be inserted into Word, Excel, Powerpoint, etc.. Most common graphic file viewers can also view them.

9.6.4 Make a PDF File

Install the Adobe Acrobat reader from the Warrior Software CD or Download the Adobe Acrobat Reader http://www.adobe.com/products/acrobat/readstep2.html .It is a free version.
This option is exactly the same as the TIFF files procedure, although to install use PDF File, rather than TIFF File. The Setup is also slightly different as the compression options vary from those of the TIFF file.
The Output type can be Color or monochrome

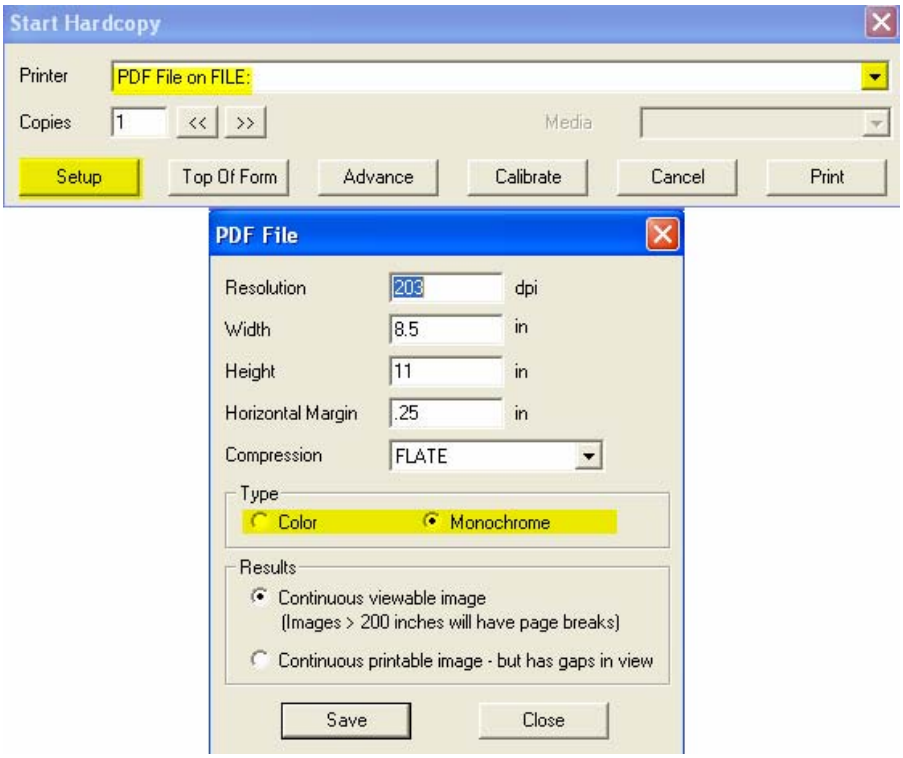


FIG: 9.12 PDF file settings

Section

10

10 Plot Job Editor

The Plot Job Editor is a program module, which enables the operator to assemble the various components (heading, log sections, etc.) of a well log into its final presentation. The resultant plot job information is saved in a well log database, usually alongside the log data. The Presentation Plot program uses the plot job information to create the graphical output to a plotter or other graphics device (fax file, etc.).
The Plot Job Editor is started from its icon in the Warrior group, the Presentation Plot File menu, or the Acquisition module Edit menu. (Video 10.1)
Double click on the program group icon, the Acquisition Edit menu or the Presentation Plot File menu

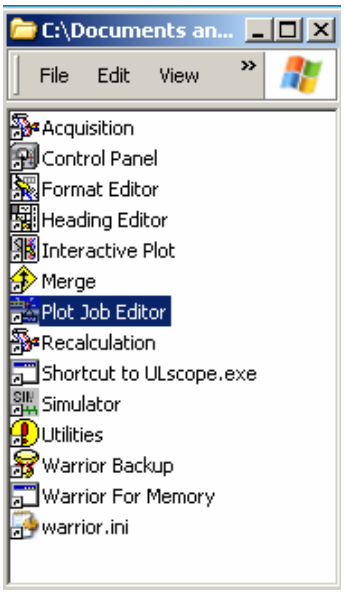


FIG: 10.1Select Plot Job Editor

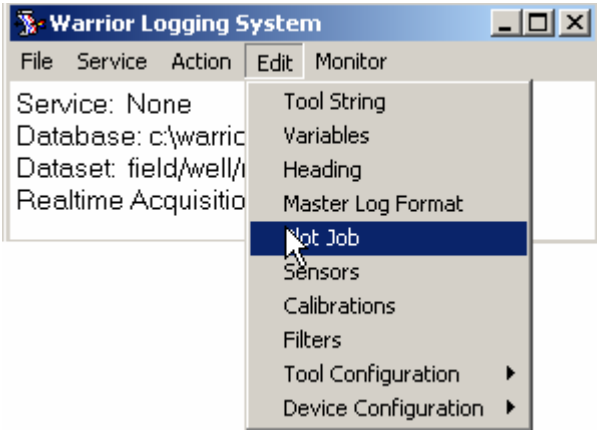


FIG: 10.2 Select Plot Job

10.1 File

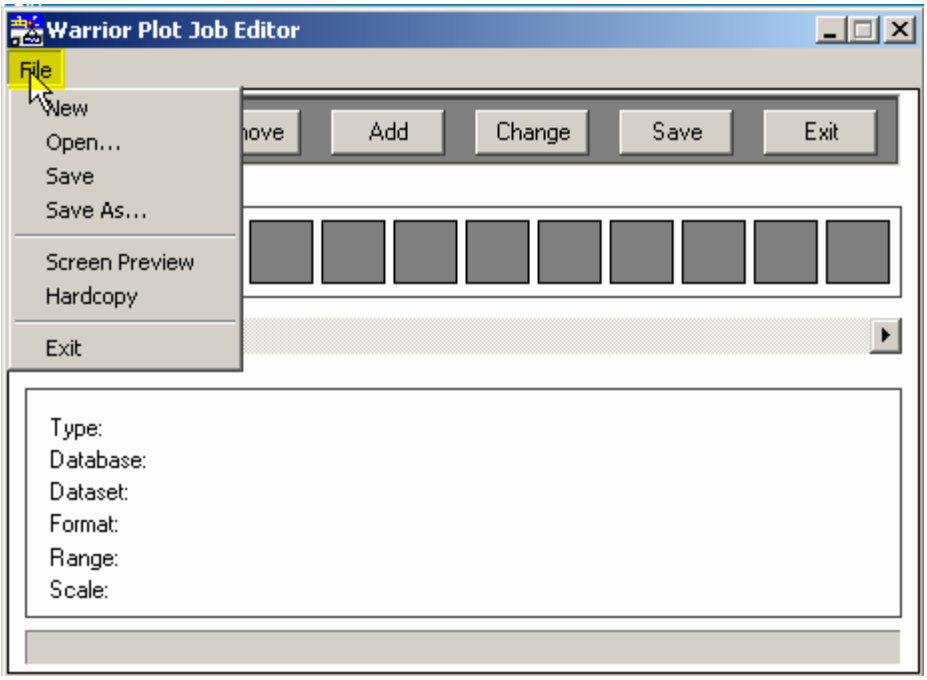


FIG: 10.3 File Menu

The menu functions are as follows:

10.1.1 New

If a plot job is currently selected, New clears the editor for a new plot job.

10.1.2 Open

Displays the file selection window to allow the operator to select the database file containing the plot job to be edited. Note that plot job information is stored in the Warrior database file at the run level.

10.1.3 Save

After creating or editing the plot job it may be saved within a Warrior database file

10.1.4 Save As
Allows a plot job to be edited and subsequently saved to new location with a different name.

10.1.5 Screen Preview
Starts Screen Preview of the selected plot job, see manual section on Presentation Plot.

10.1.6 Hardcopy
Displays a list of the plotters supported on the logging system. Selection of one of the plotters causes the plot job to be output to the hardcopy device (plotter).

10.1.7 Exit
Closes the Plot Job Editor

10.2 Start the Plot Job Editor.

When the selection of the items is complete the plot job data is saved in the Warrior database.
If the Plot Job editor is invoked from within the Acquisition module the database path and name are set to be those of the current database. If invoked from elsewhere the full path must be entered by the user. (LEAVE NO ASTERISKS / WILDCARDS) The blank plot job appears as shown above.

10.2.1 Change
Changes plot job to be edited.

10.2.2 Remove
Removes the selected file from the plot job.

10.2.3 Add
To create a new plot job start with the Add button

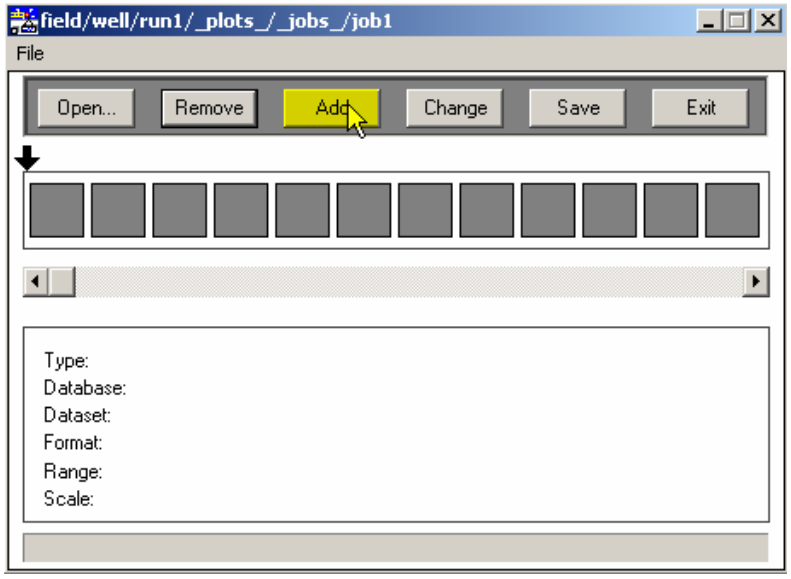


FIG: 10.4 Add File

Add Displays the selection box containing types of files, which may be included in the plot job.

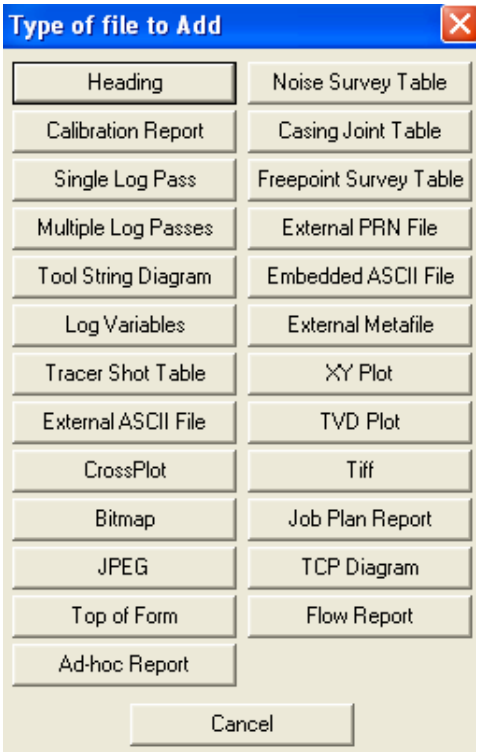


FIG: 10.5 Select the File to add

Selecting a database file causes a list of plot jobs stored within the database to be displayed.

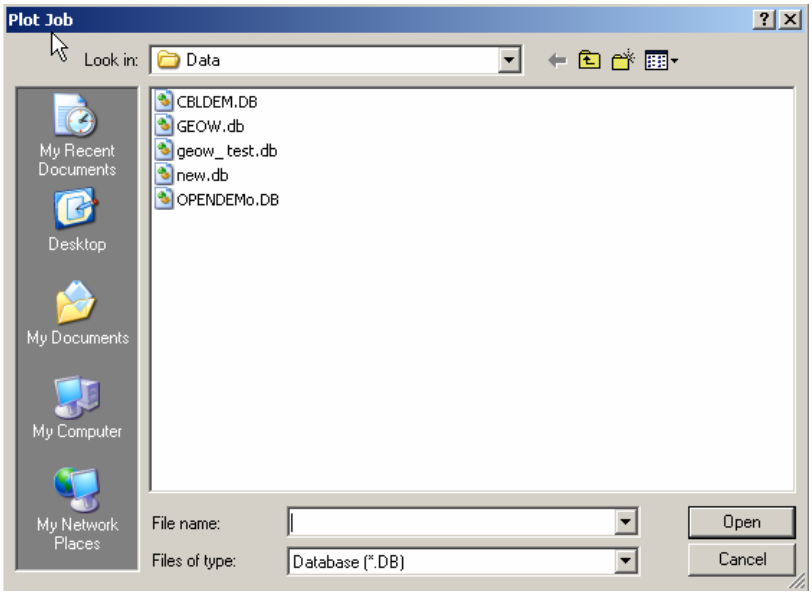


FIG: 10.6 Select Database

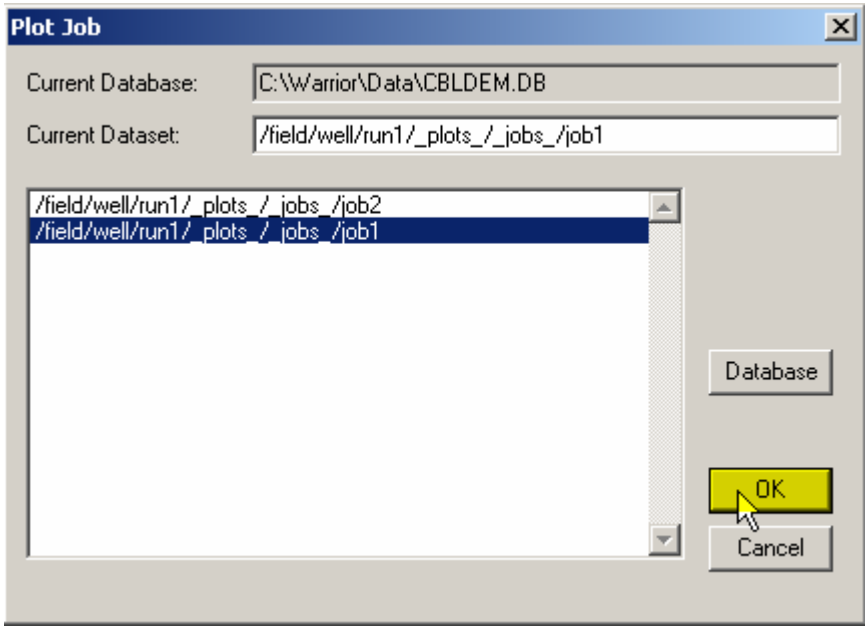


FIG: 10.7 Select Plot Job

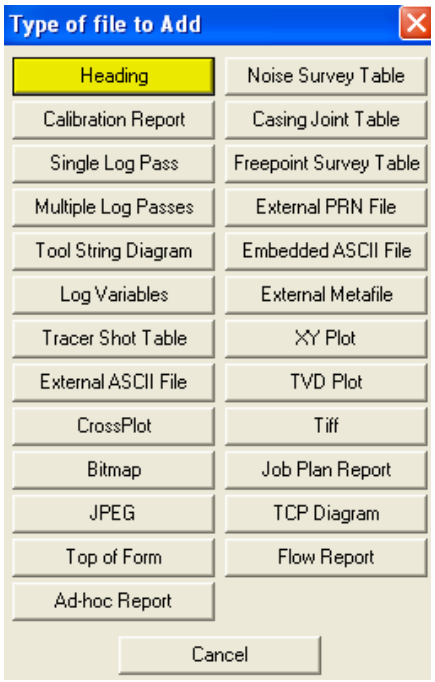


FIG: 10.8 Select Heading

Typically a log heading would be the first file to appear in the plot job. Click on Heading and, because headings are stored in the log databases, the database selection window is displayed. Select the database where the required heading is stored. A list of the headings stored in that database is displayed

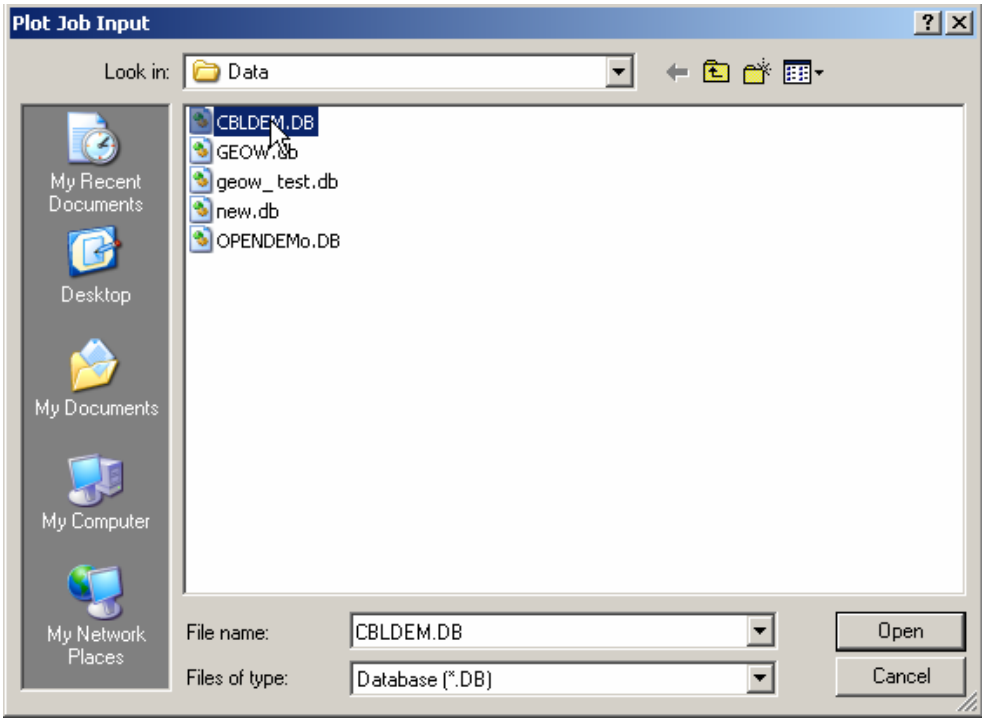


FIG: 10.9 Select Database

Select the required heading by double clicking, or highlighting and the OK button. The heading appears as an icon at the start of the plot job sequence, as shown below.

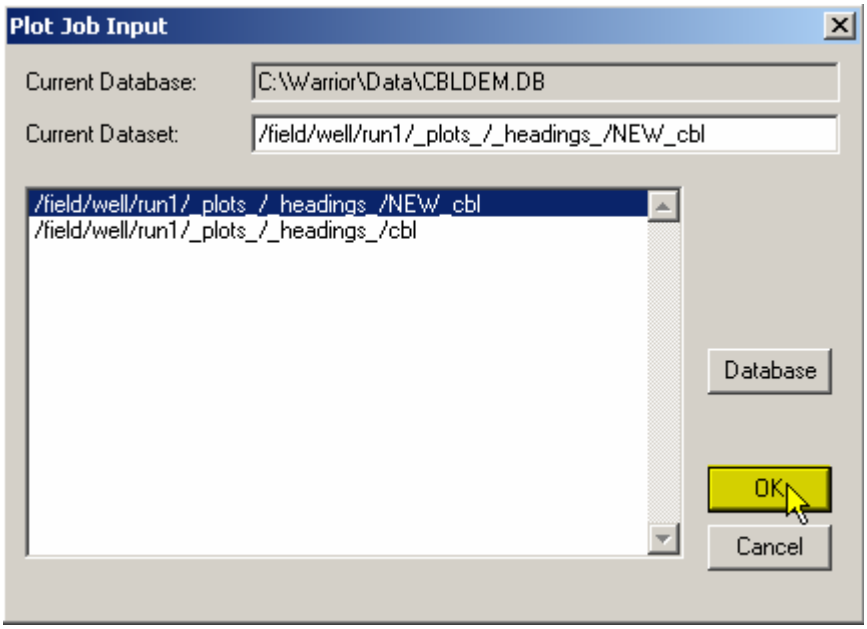


FIG: 10.10 Select Plot Job Input

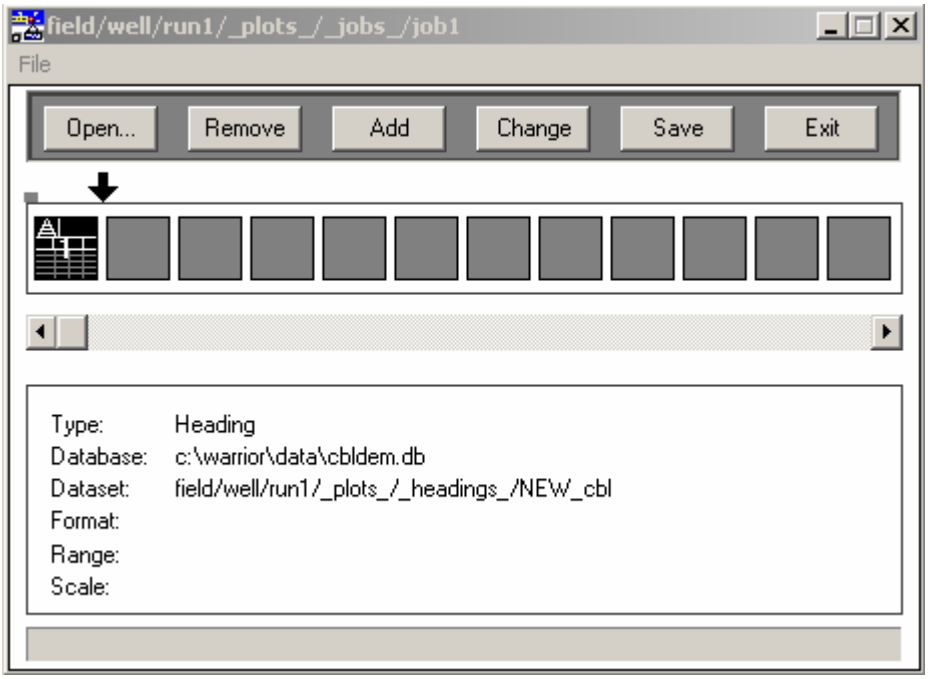


FIG: 10.11 Add Heading

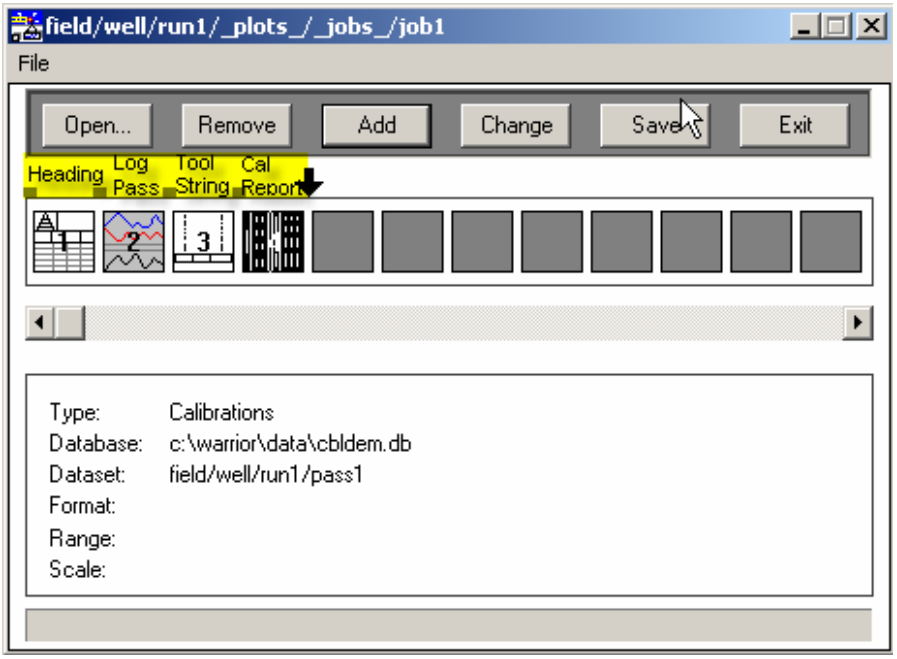


FIG: 10.12 Add Heading, Log Pass, Tool String, and Calibration Report

Other files may be added as required in the order they are to appear on the final log presentation. To add a log section click on Single Log Pass and a list of the log passes in the currently selected database is displayed.

Selecting Multiple Log Passes allows the operator to select for inclusion the plot job several log passes at the same time. This is useful when there are many passes to be included, as with production logging.
Other items from the type list may be added as required. Tool string diagrams and calibration reports are stored at the pass level, therefore when adding an item of these types, a list of the log passes is presented.
In this way the items to be presented on log print are defined together with the order in which they are to appear. Each item appears as an icon as shown below.

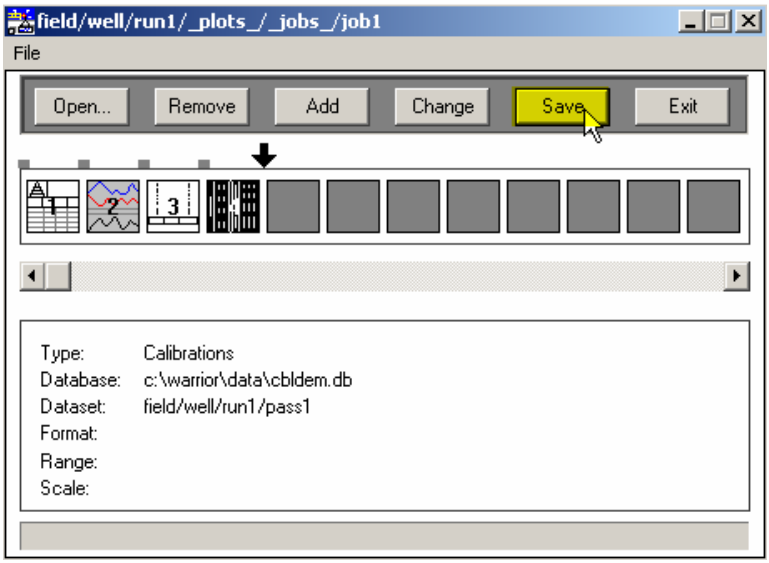


FIG: 10.13 Save

Note that the plot job contains information concerning which files are to be plotted, in which order, and with what presentation. It does not contain the files themselves, therefore the files may be modified e.g. by adding annotations, without the need to recreate or modify the plot job itself.
Selecting External PRN file allows the inclusion within the plot job of plot or print output from any Windows application. It is necessary that the material to be added to the plot job have been previously printed to a PRN file from the particular application. See Windows Help - Print to a file for details on how to do this.
Upon completion of the plot job sequence the job may be plotted by choosing the Hardcopy option from the file menu. Alternatively the Presentation Plot program may be started from the Warrior program group (particularly if a Screen Preview is required).

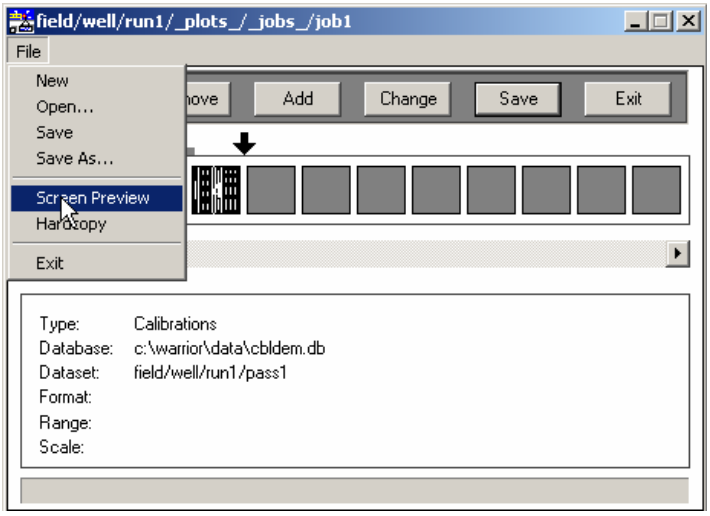


FIG: 10.14 Select Screen Preview

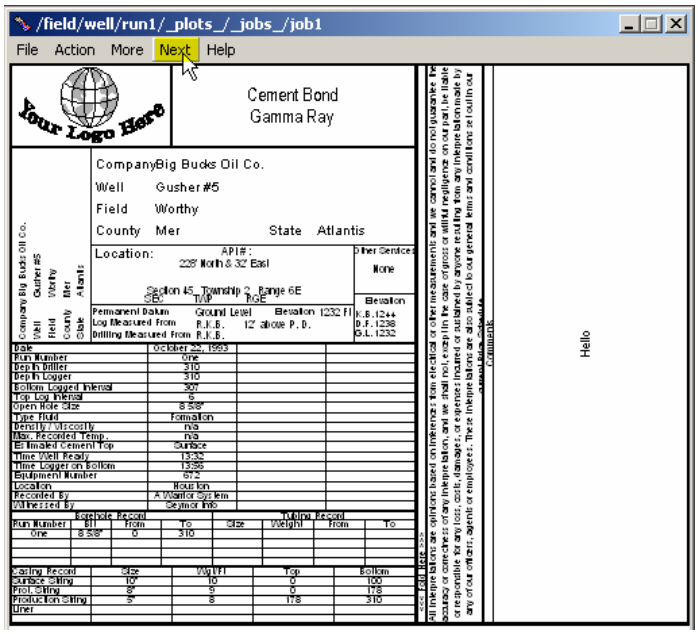


FIG: 10.15 Heading

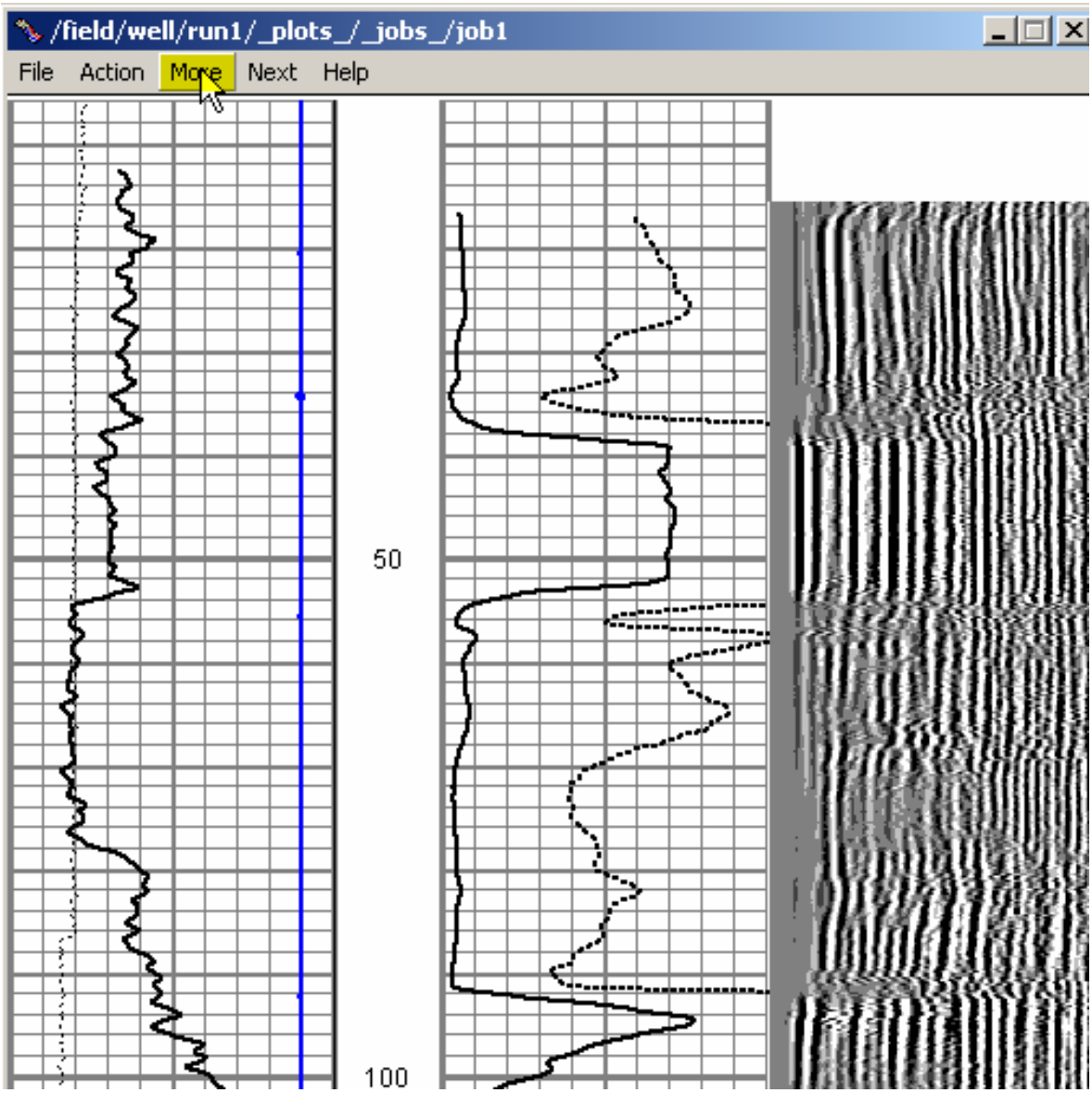


FIG: 10.16 Log Pass

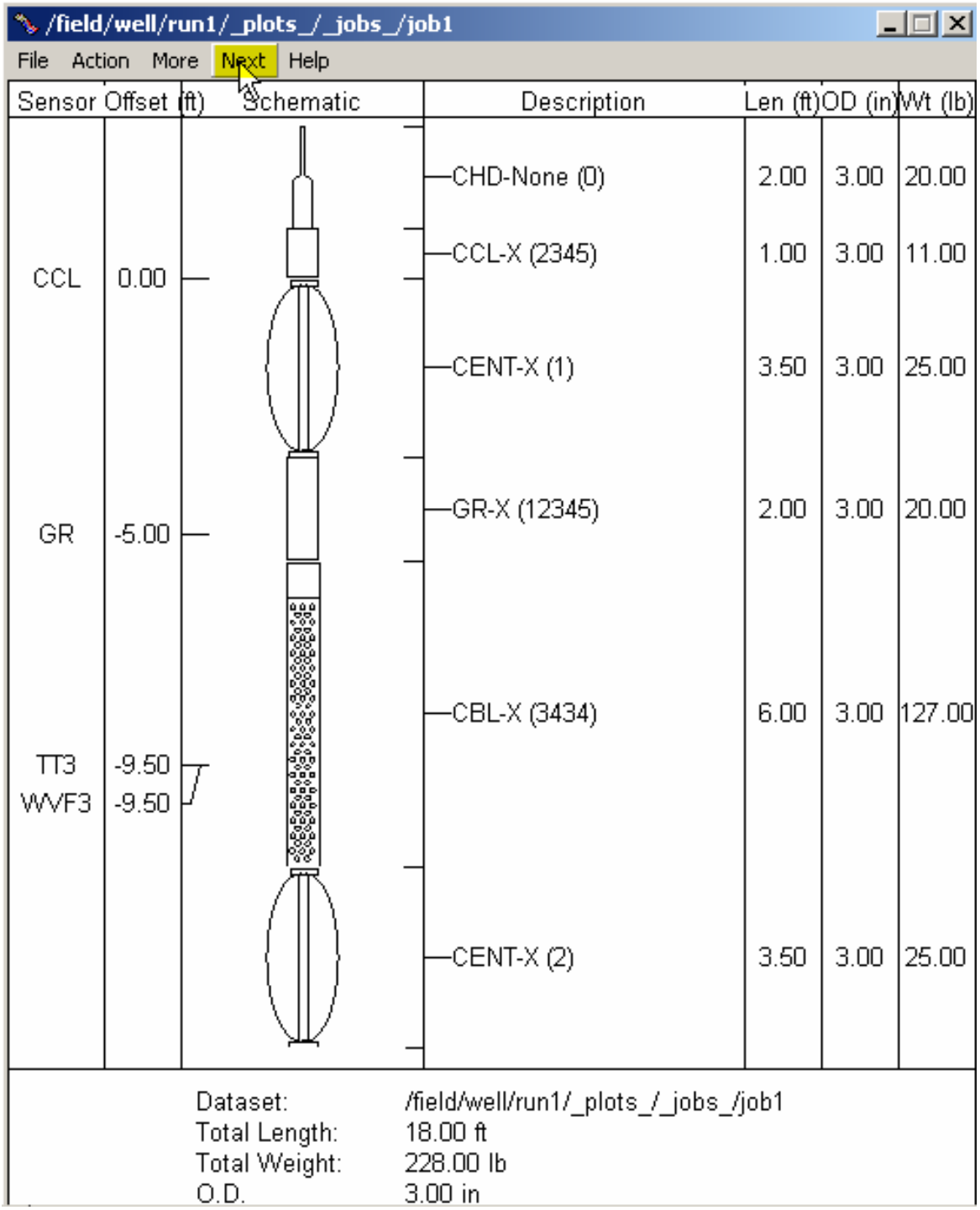


FIG: 10.17 Tool String Add

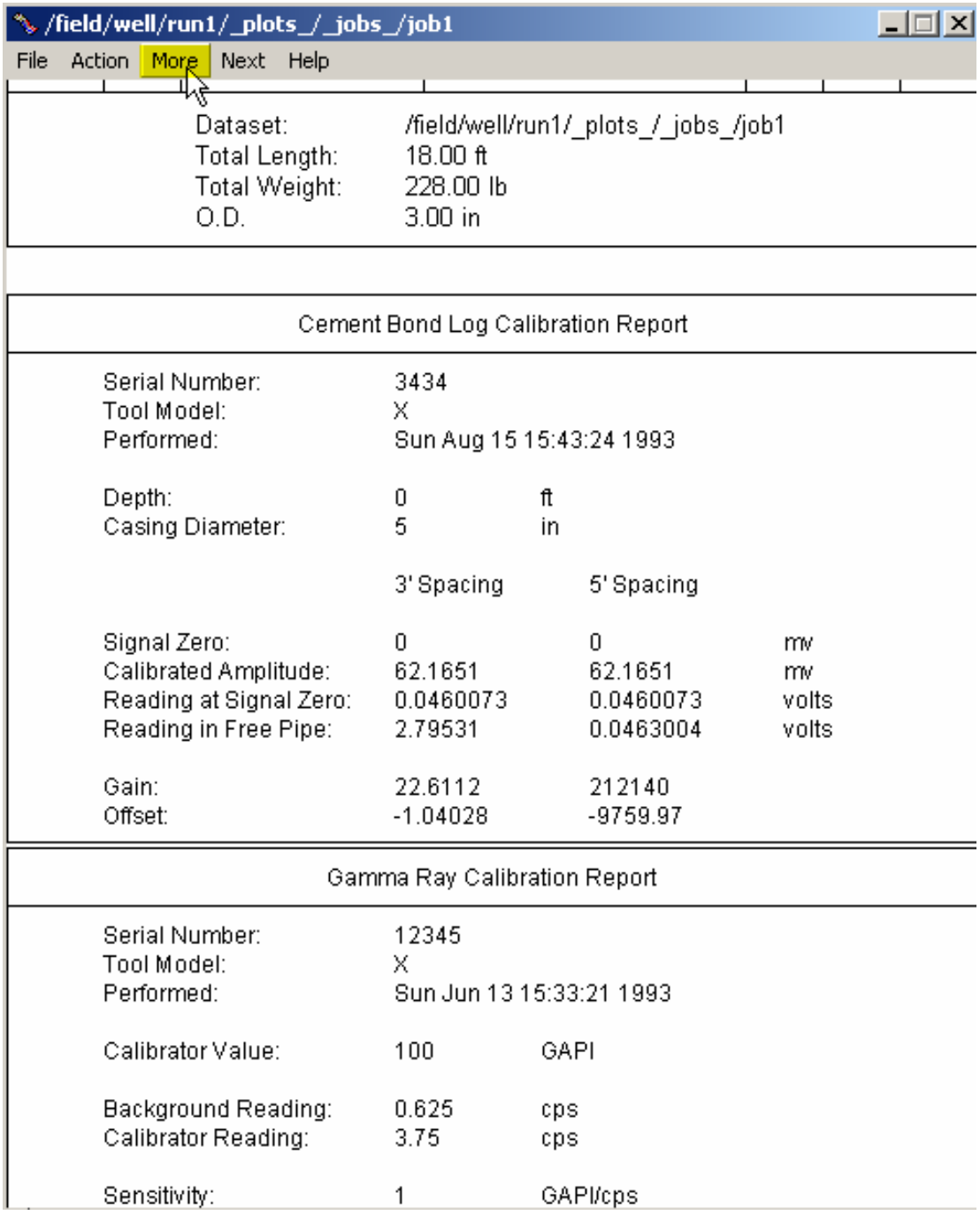


FIG: 10.18Calibration Report

VIDEO: 10.1 Plot Job Editor

Section

11

11 Recalculation

The recalculation mode allows log data to be recalculated or relogged from raw data. Calibrations and other acquisition parameters, such as filters and depth offsets, may be changed. The data monitors used during actual logging are available to the operator during recalculation.
Double-click the Recalculation icon in the Warrior group and a menu box similar to that of Acquisition will appear. In this case though, Service and Action are disabled (appear feint on the menu bar). The Edit and Monitor menus are identical to those of Acquisition.

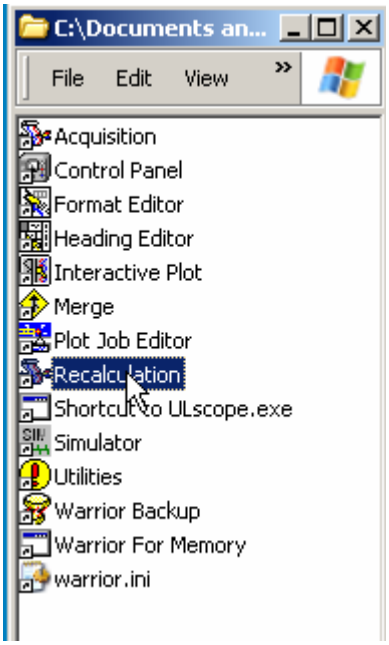


FIG: 11.1 Recalculation

11.1 File

The following option can be select in File:
Select Dataset, About, Exit, Close All.

11.1.1 Select Dataset

The Warrior well log database can (optionally) contain data from many wells, and within each well, data from many log passes. Each log pass is stored in a dataset. The dataset contains not only log data, but also other information about the logs, e.g. calibration and tool data

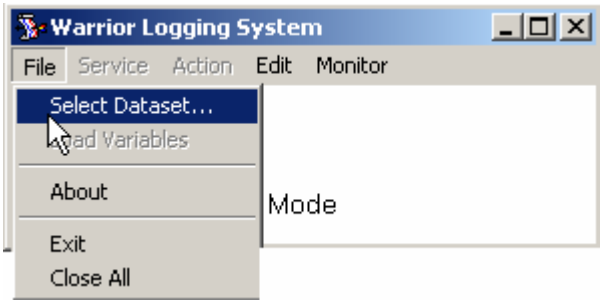


FIG: 11.2 Select Dataset

Choose the Select Dataset option from the File menu. A dialog box will appear as shown below.
The software includes a database named cbldem.db that may be used for the purpose of demonstrating the Recalculation mode. Select the dataset as shown below.

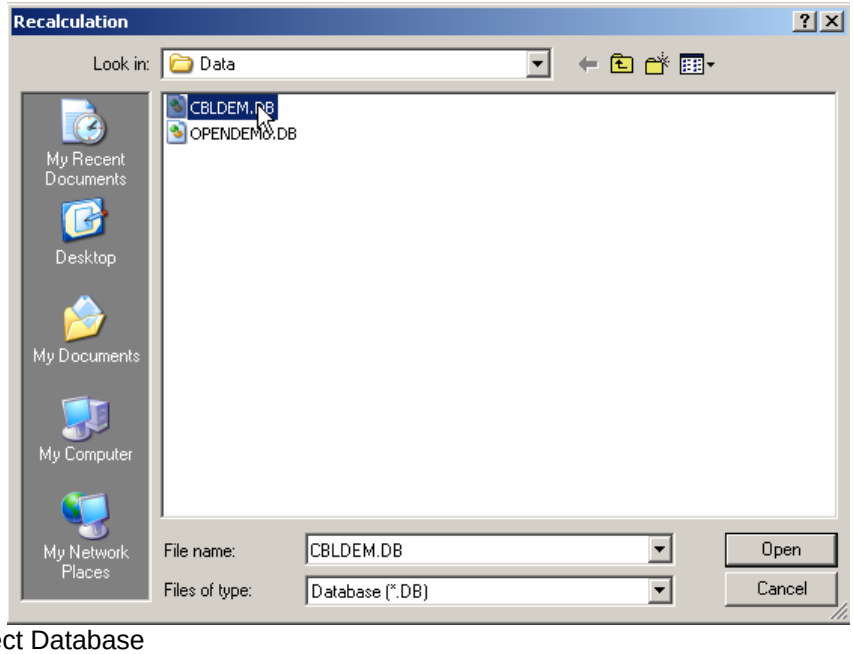


FIG: 11.3 Select Database

The Recalculation Output is the destination pass (or dataset) of the recalculated data. It may be named anything you like. If this pass already exists in the database when Recalculation. Is invoked, the software will give an error message and a new Recalculation Output should be selected.
Allowing the system to give a default name to the recalculated output will cause it to be named x.1, where x is the name of the original pass. Repeated passes through Recalculation. Will cause an incrementing number to be attached to the Recalculation. Output. In this case pass1.2, pass1.3 etc.
When recalculating, for example, pass 1.1 to 1.2, upon selecting 1.1 as the base pass the system will still indicate 1.1 as the output pass. It will however create a new pass 1.2

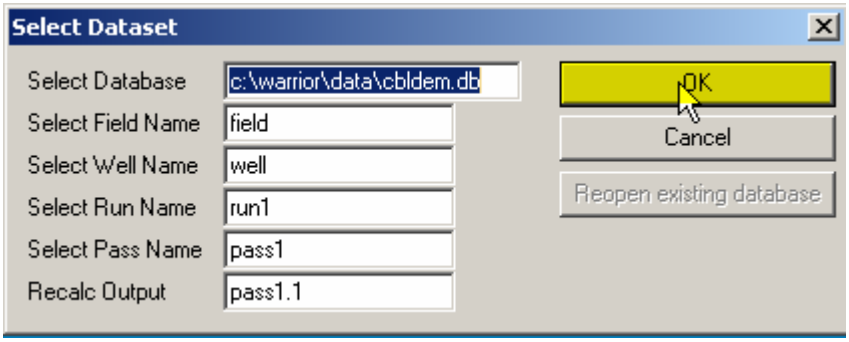


FIG: 11.4 Select Pass Name and Set recalculated Output

When OK is selected the software reads information from the log database and displays the Recalculation Control dialog box, as shown below.

11.2 Recalculation Control

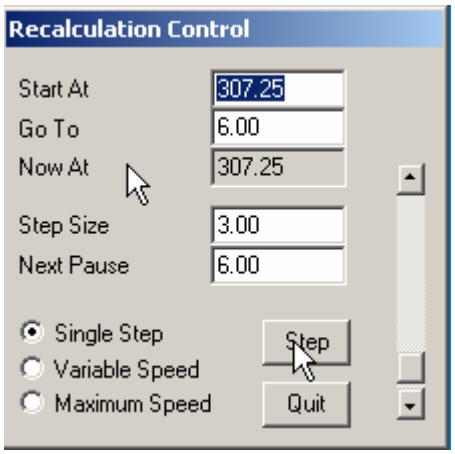


FIG: 11.5 Recalculated Control

The Recalculation Control allows setting of Start, Stop and Pause depths. It also enables setting of the Step size. The Step size is the log interval that Recalculation attempts to recalculate during its share of the CPU time and functions effectively as a speed control.

Recalculation may be run in three modes.

11.2.1 Run single step

Select a step size. This may be as small as a single sample.
Click the Single Step radio button. The log plot will appear on the left of the screen.
Successive clicks on the Step button will cause the pass to be recalculated step by step.

11.2.2 Run variable speed

Select a step size.
Click the Variable Speed radio button. The log will appear on the left of the screen and will scroll at a rate that may be varied by the scroll bar in the Recalculation dialog box. Increasing the step size also increases the recalculation rate.

11.2.3 Run maximum speed

Select a step size.
Click the Maximum Speed radio button. The log will appear on the left of the screen and scroll at its maximum rate. It is likely that the recalculation will complete quickly, but that the log on the screen will lag.

11.2.4 Pause Recalculation

Click once on the QUIT button causes the Recalculation to pause.

11.2.5 Quit Recalculation.

Click twice on the QUIT button.

11.3 Load Variables

The Load Variable is invoked from the Recalculation File menu. It is used to Load variables from the database.
Load Variables the other Dataset, enabling depth dependent parameters associated with the selected service to be zoned and values to be set.

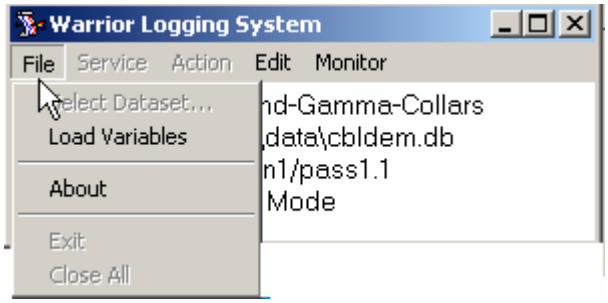


FIG: 11.6 Load Variables

11.4 Monitor

The Monitor option in recalculation has the same properties that Monitor in acquisition. (See Section 4.6)

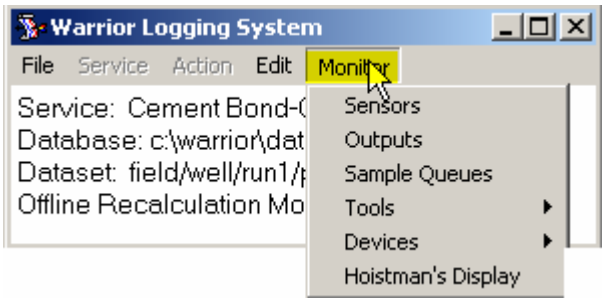


FIG: 11.7 Monitor Options

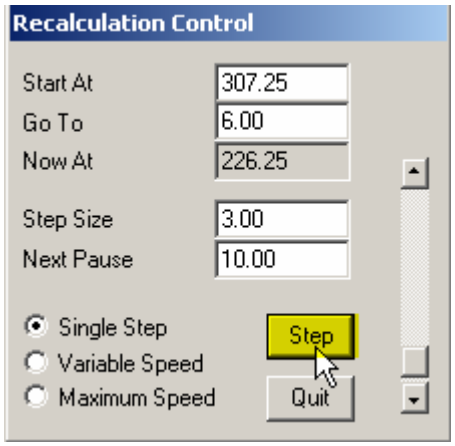


FIG: 11.8 Step Control

11.5 Edit

The Edit option in recalculation has the same properties that Edit in acquisition. (See Section 4.5). Change parameters as required. These may include:
Tool String, Variables, Heading, Master Log Format, Plot Job, Sensors, Tool Configuration, Device Configuration, depth offsets, input channels, curve filters, calibrations, sonic amplitude gate settings.

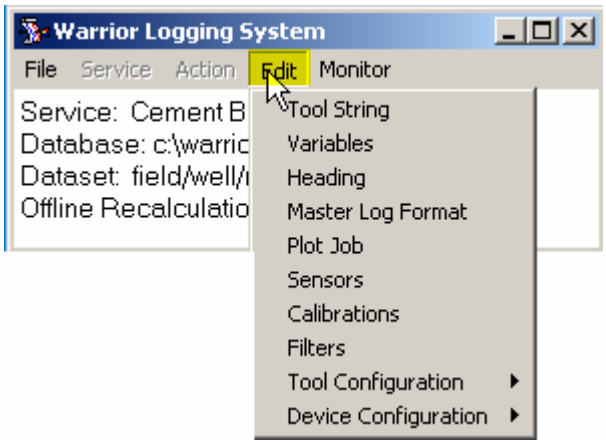


FIG: 11.9 Edit Options

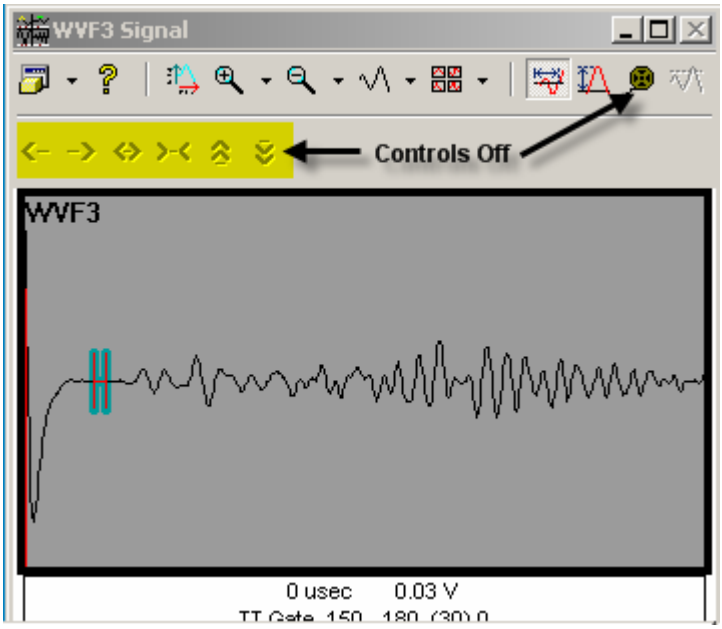


FIG: 11.10 Acoustic Signal Control Off

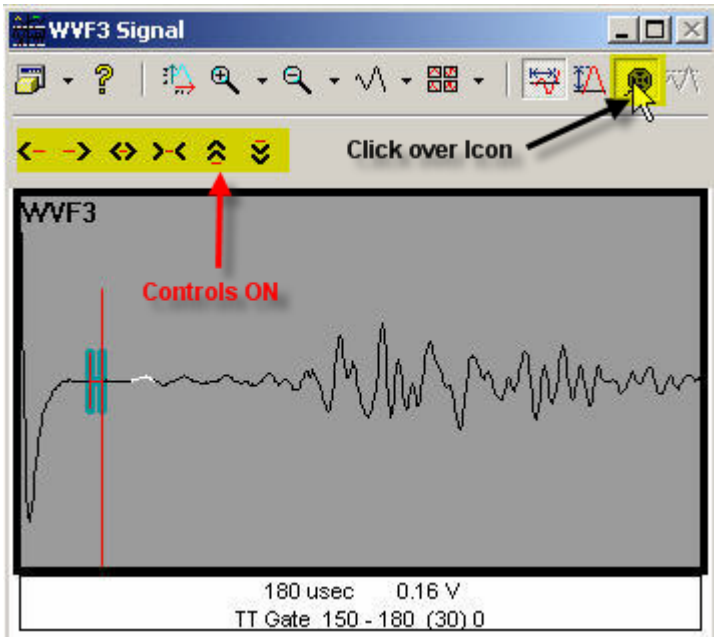


FIG: 11.11 Acoustic Signal Control set ON

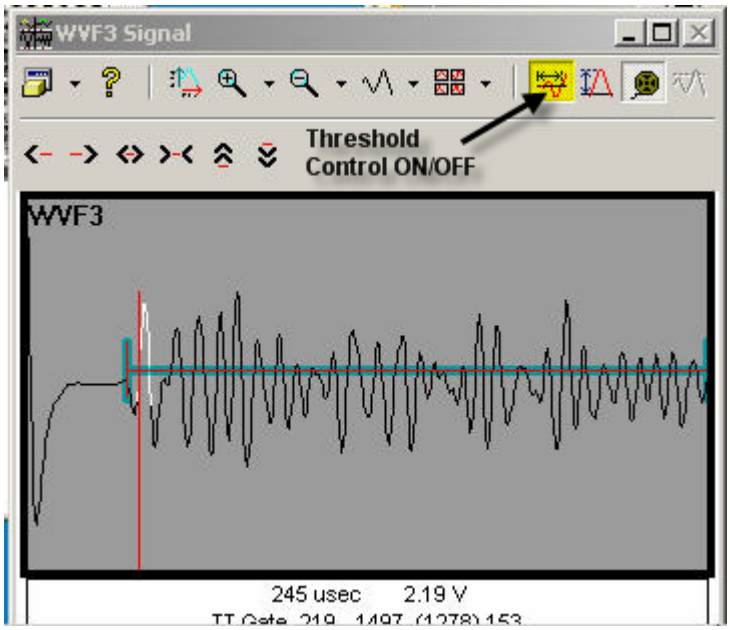


FIG: 11.12 Thresholds and Gate Control ON

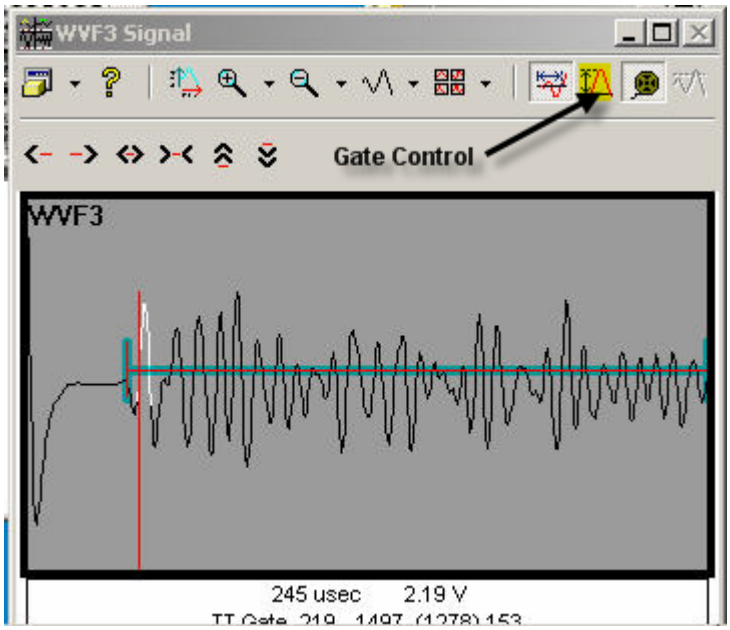


FIG: 11.13 Gate control Set ON

VIDEO: 11.1 Acoustic setup Travel Time gate, Amplitude gate, and scales.

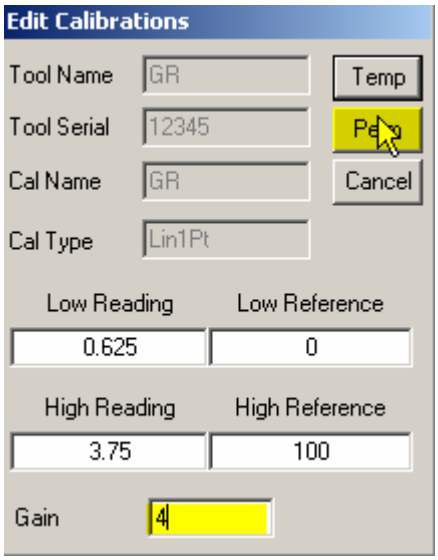


FIG: 11.14 Edit GR Calibrations

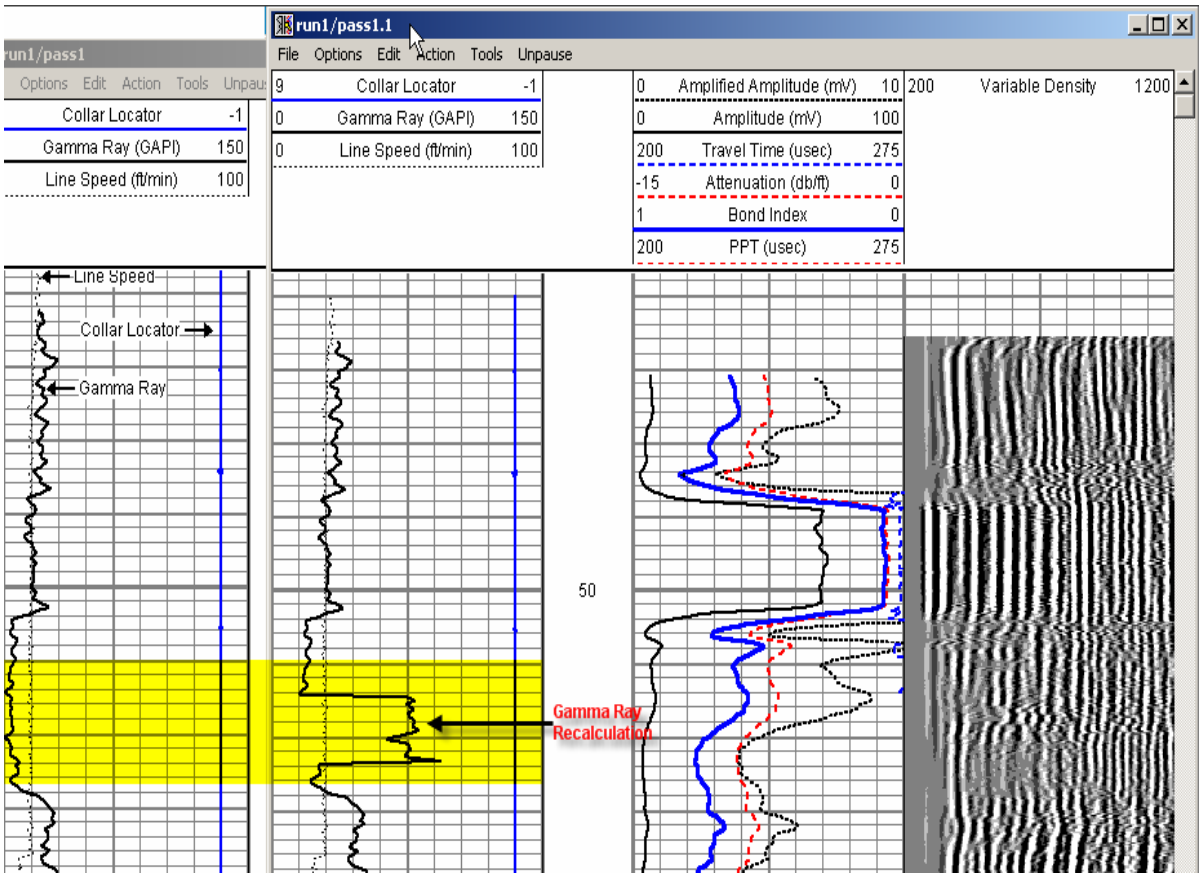


FIG: 11.15 GR Curve Before and After the Recalculation

Section

12

12 Merge/Splice, TVD Merge/Splice

The Wizard, Merge, Splice and TVD module allows data from one or more database files to be manipulated in the depth domain and output to one or more destination files. Data may be depth adjusted and correlated, curves from multiple runs spliced together, outputs renamed etc. The module also includes the capability to calculate True Vertical Depth (TVD) from directional survey data and generate log data referenced to TVD for subsequent plotting and other operations. Most of the Merge program operations may be accomplished with only one pass through the data.
Double-click the Merge icon in the Warrior group

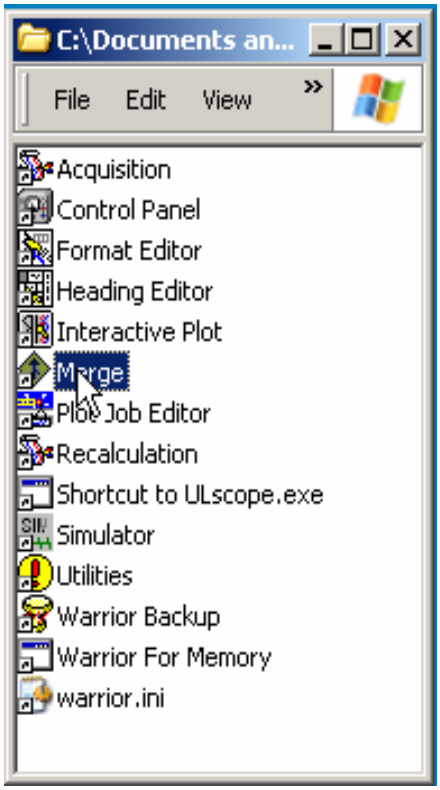


FIG: 12.1 Warrior Group

12.1 Wizard

The Wizard option is easy way to do Merge two Passes, Splice, Replace and Add curves

12.1.1 Merge two Passes

Double-click the Merge two Passes option.

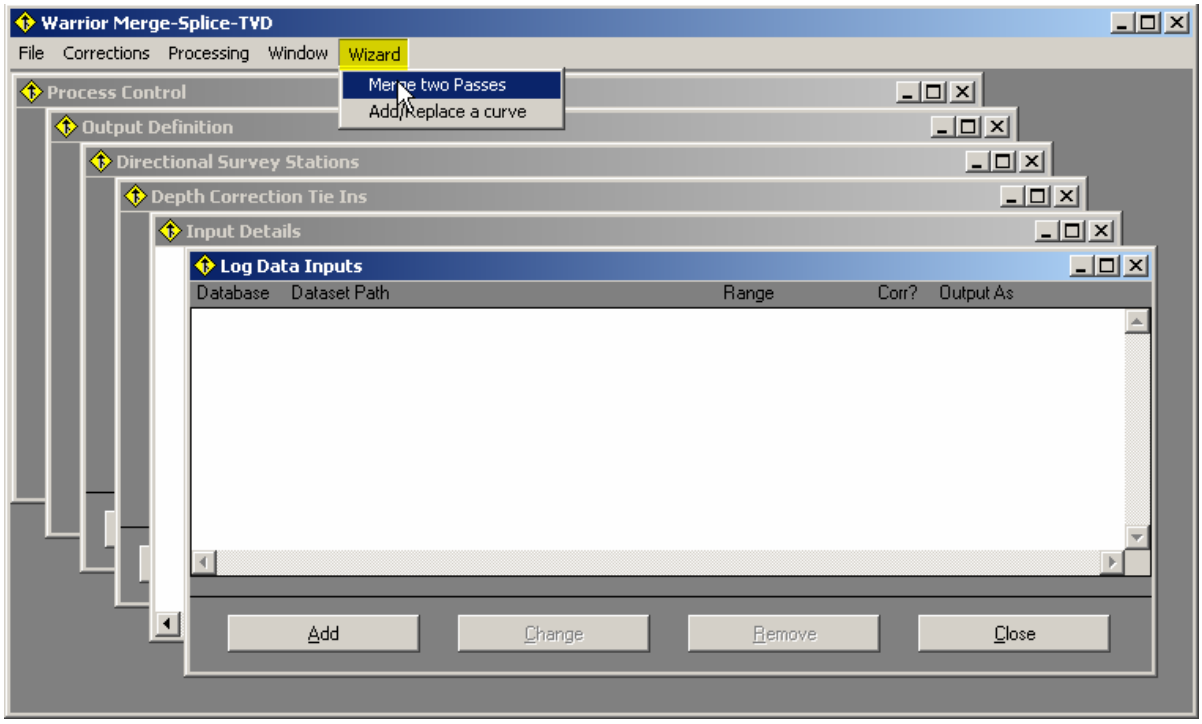


FIG: 12.2 Wizard/Merge two passes option.

Set the Base Pass as Upper Pass or Lower Pass and select the Database

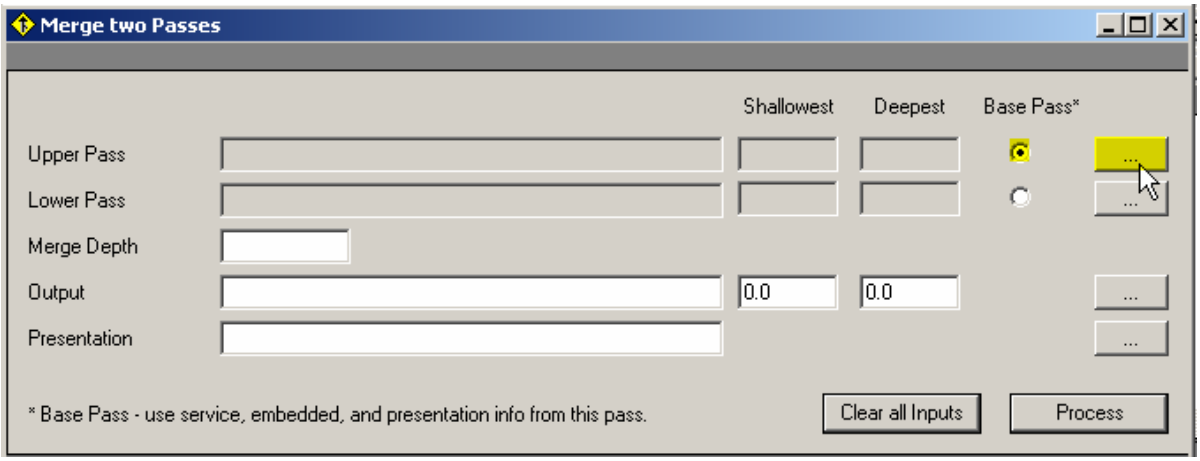


FIG: 12.2 Merge two Passes set the Base Pass as Upper Pass

Select the Input pass to merge from the Database

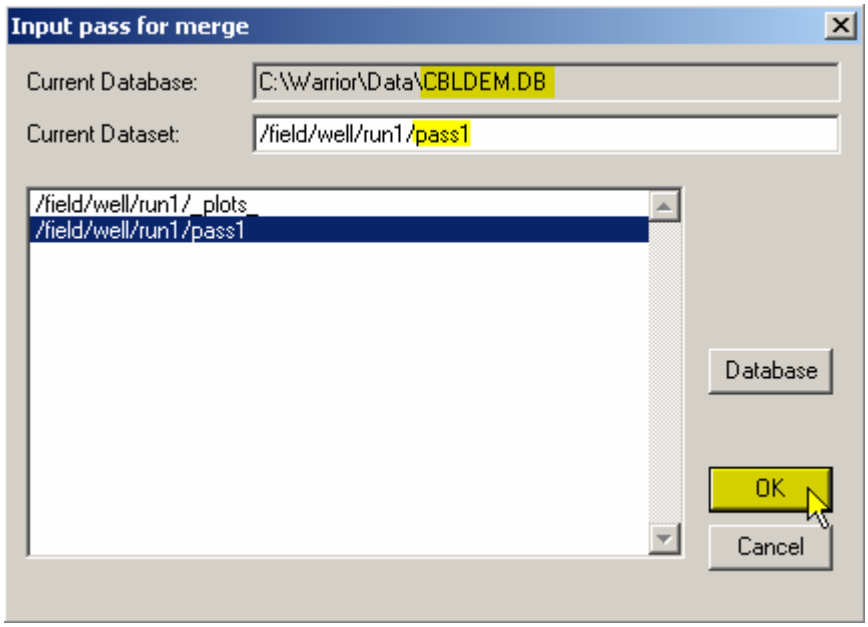


FIG: 12.3 Select Input pass for Merge

Select the Pass from the database to set as Lower Pass

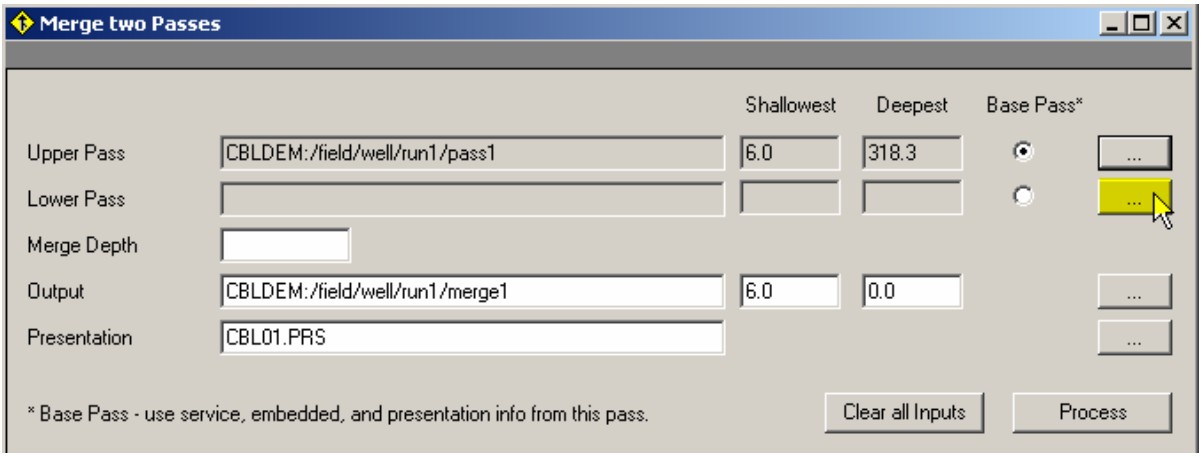


FIG: 12.4 Select Pass as Lower Pass

Select the Pass from other Database

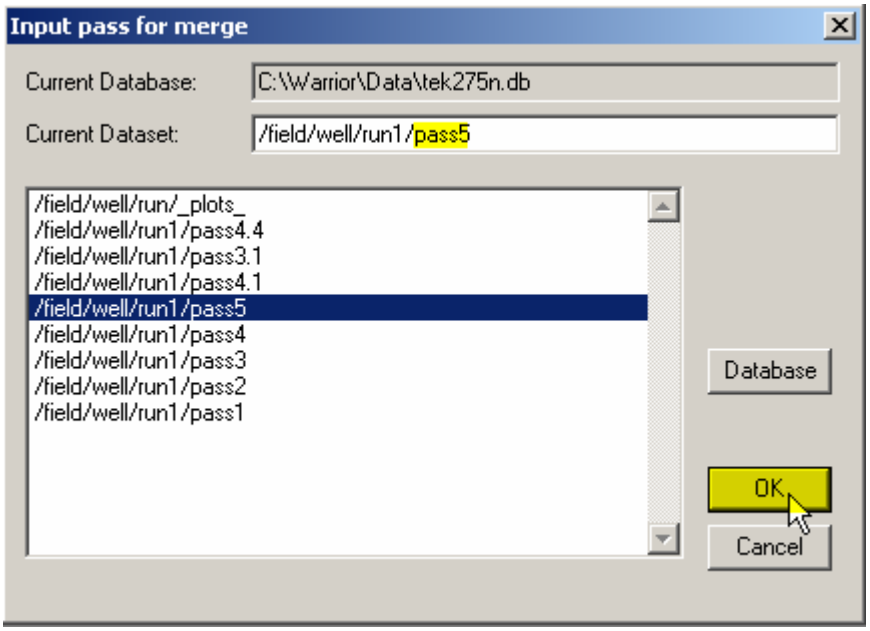


FIG: 12.5 Select pass from the Database

The software by default created a pass (Merge1).
Set the depth to start the Merge1 (Splice the curves), Define the log interval and set the presentation.

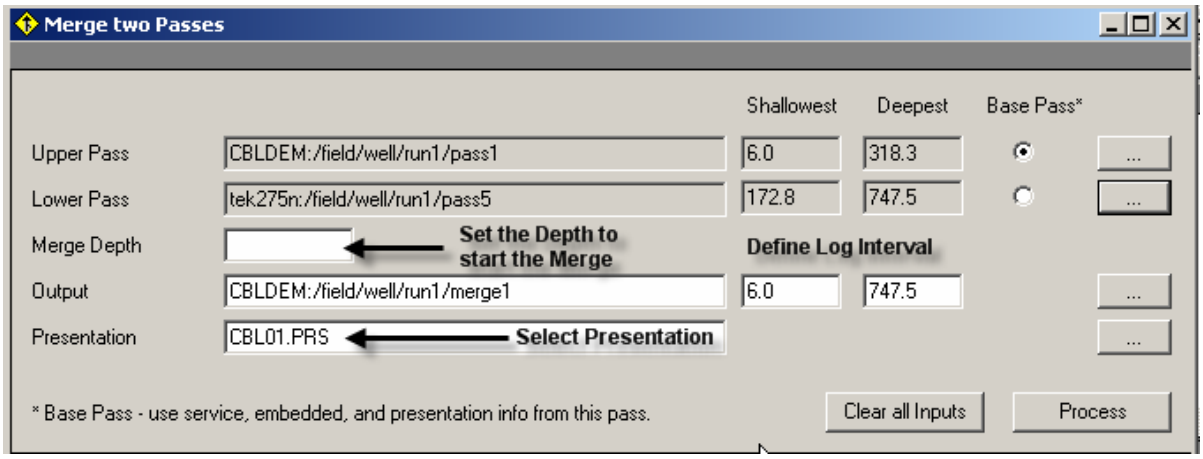


FIG: 12.6 Merge two passes

Double-click the Process bar

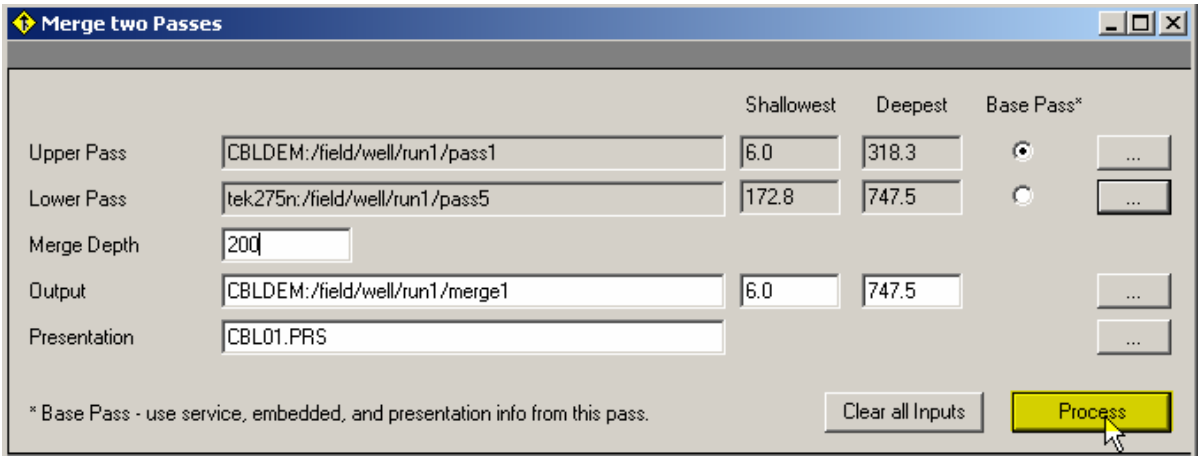


FIG: 12.6 Start the Process

Processing the Merge 1

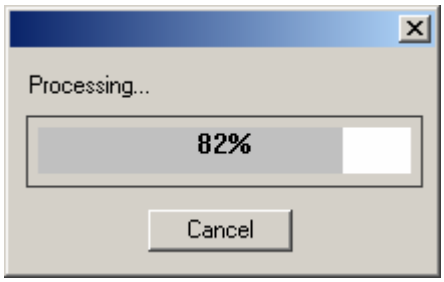


FIG: 12.7 Processing

Select Interactive Plot in the warrior group

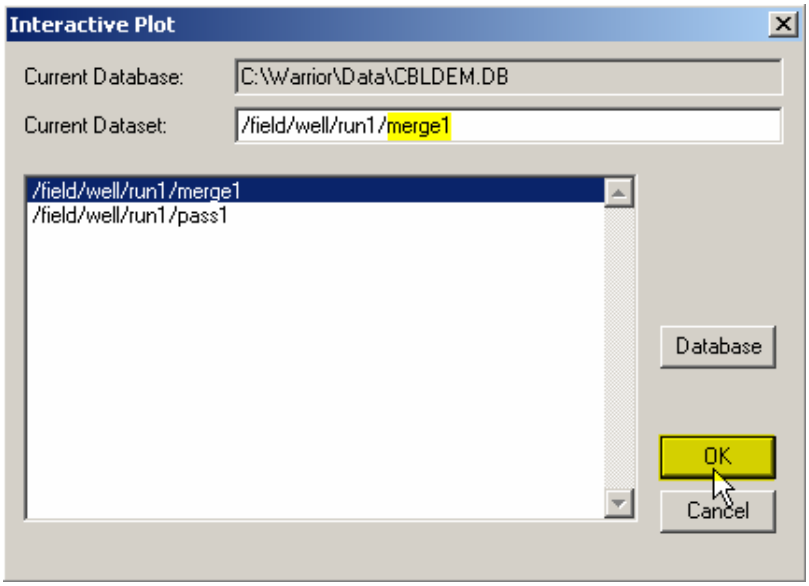


FIG: 12.8 Select Database from interactive plot

Screen plot the Merge1 check the Merge the curves (Splice) at 200 FT.

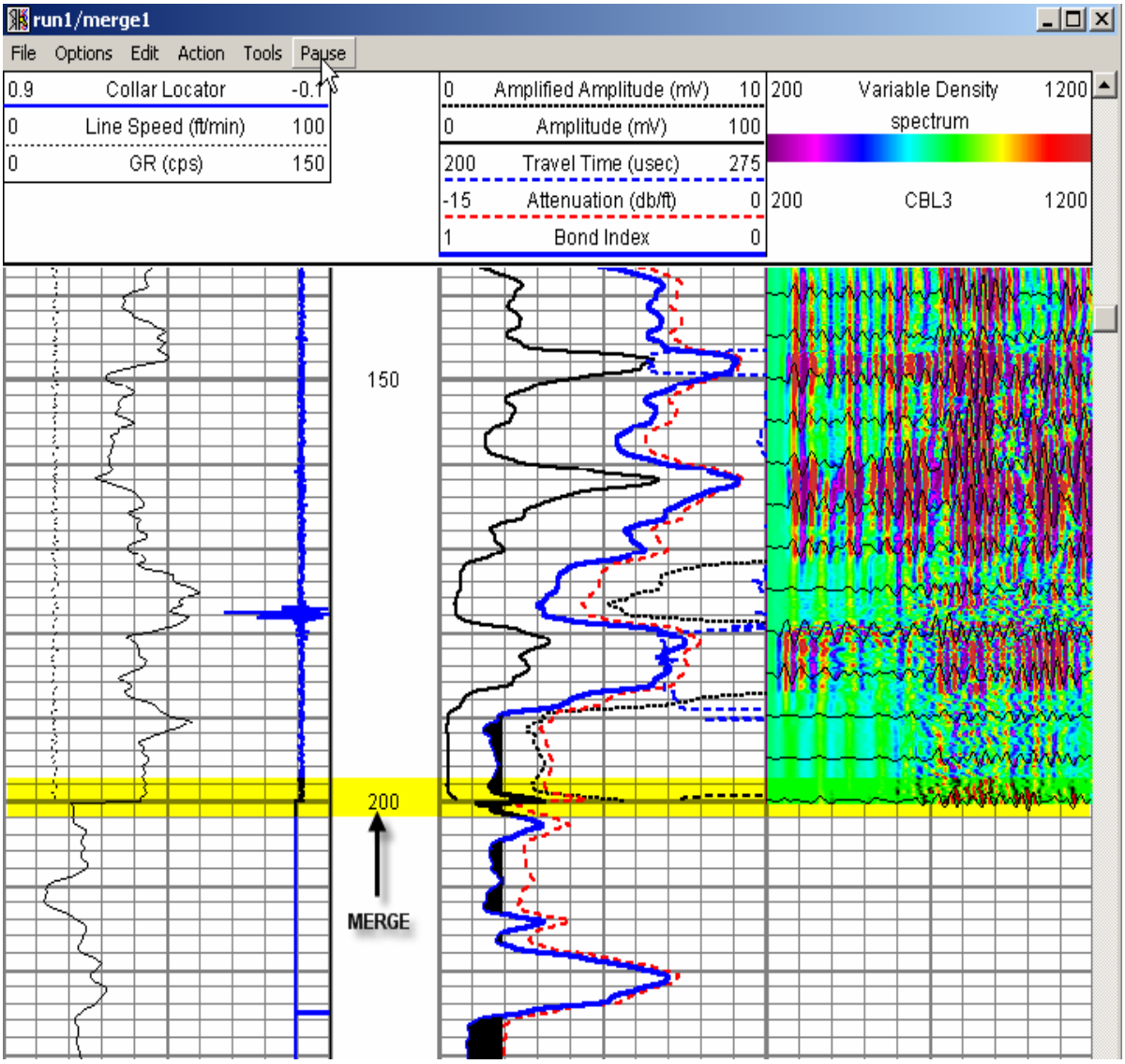


FIG: 12.9 Screen Plot Merge1

12.2.2 Merge two Passes (Add Curves)

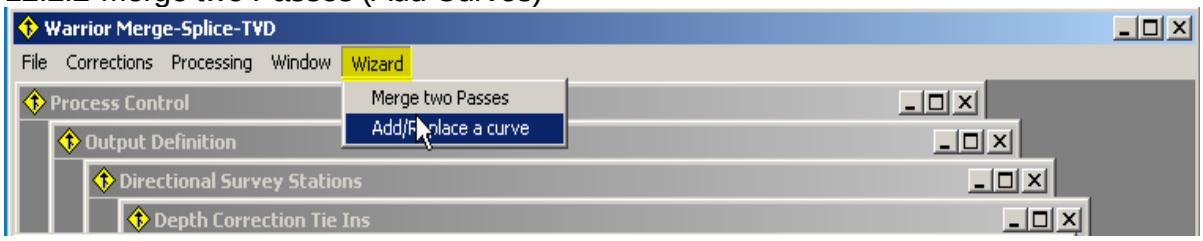


FIG: 12.10 Select Add/Replace a curve

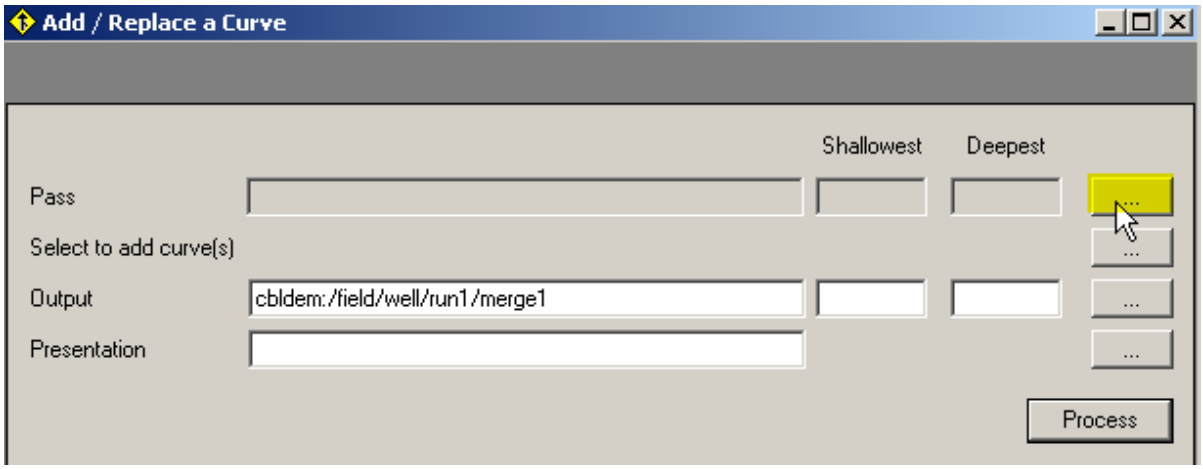


FIG: 12.11 Select the Base Pass

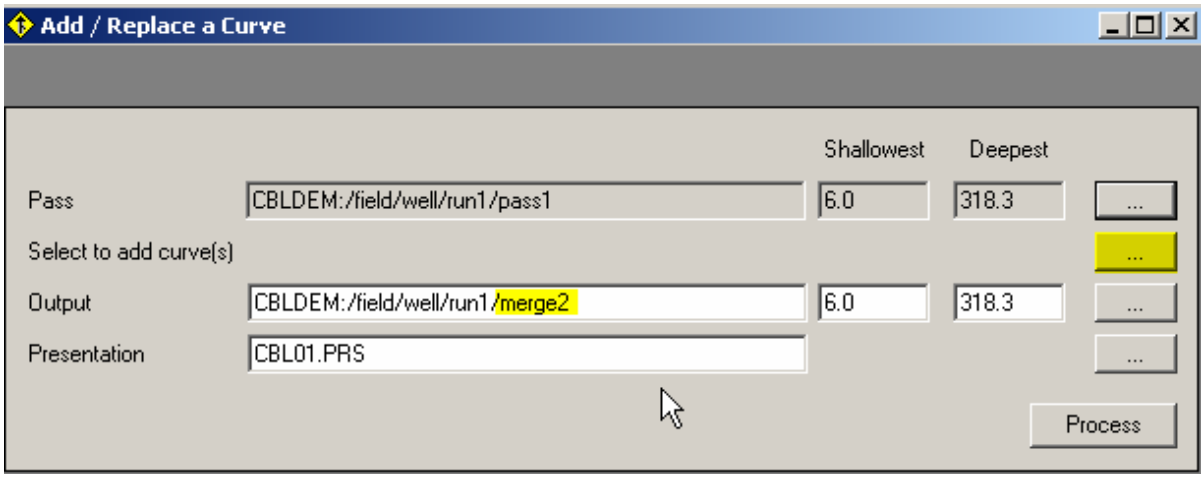


FIG: 12.12 Select to add curve

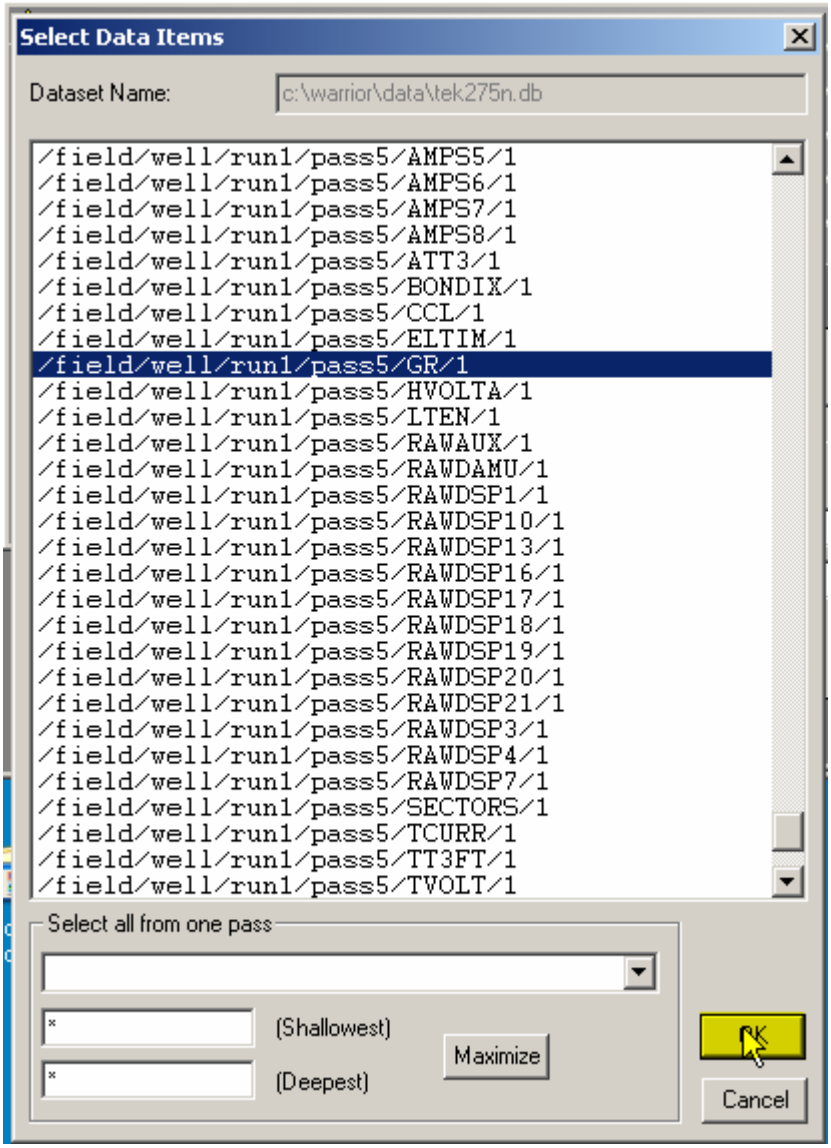


FIG: 12.13 Select the curve

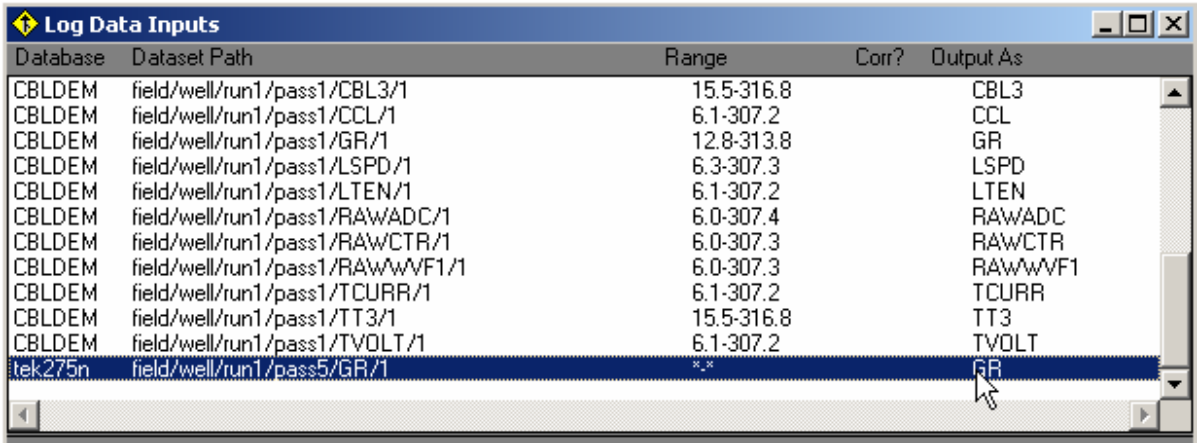


FIG: 12.14 Select the curve in log Data Inputs

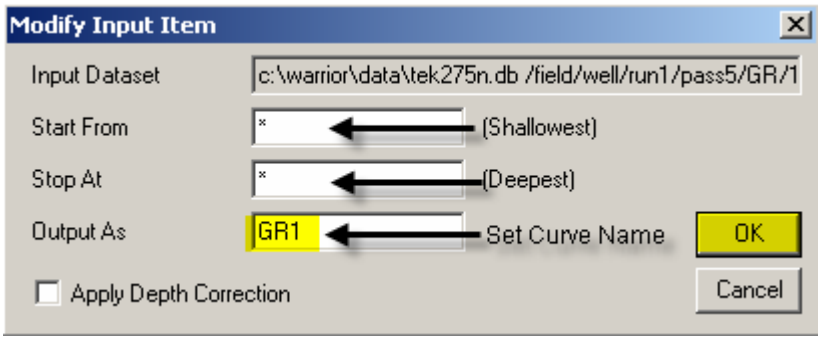


FIG: 12.15 Modified input Curve

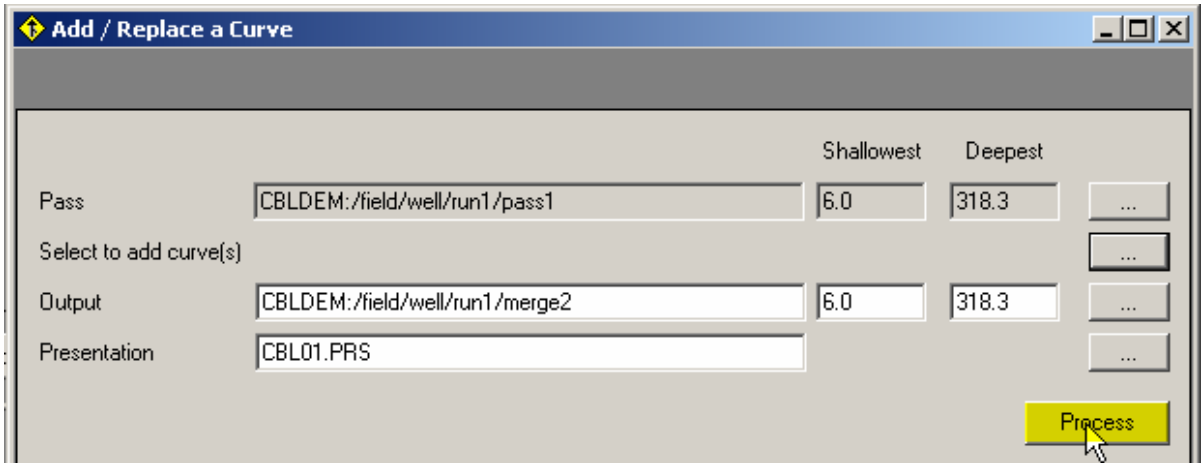


FIG: 12.16 Add Curve and Process

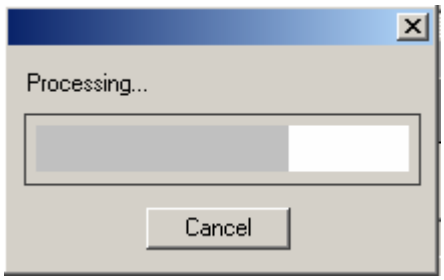


FIG: 12.17 Processing

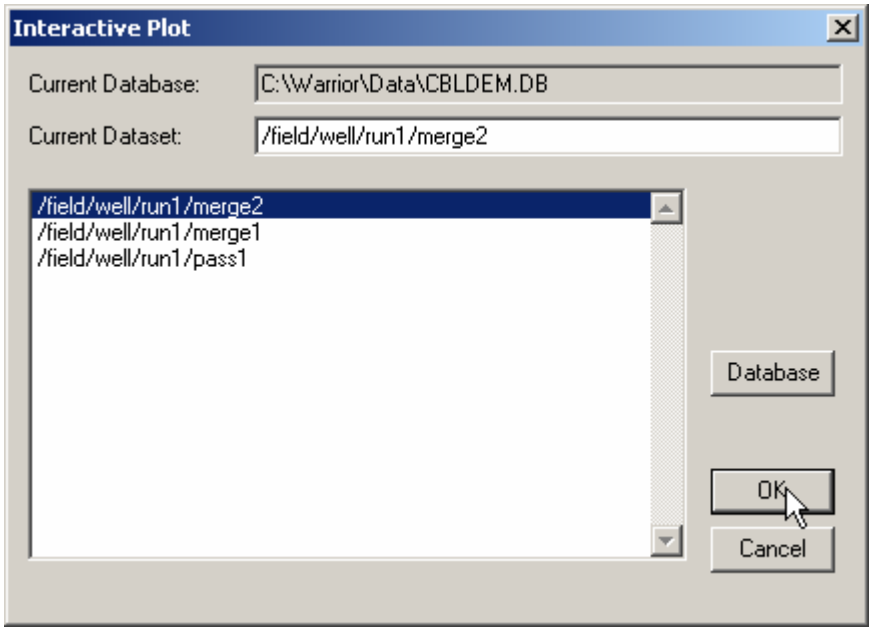


FIG: 12.18 Interactive Plot select pass

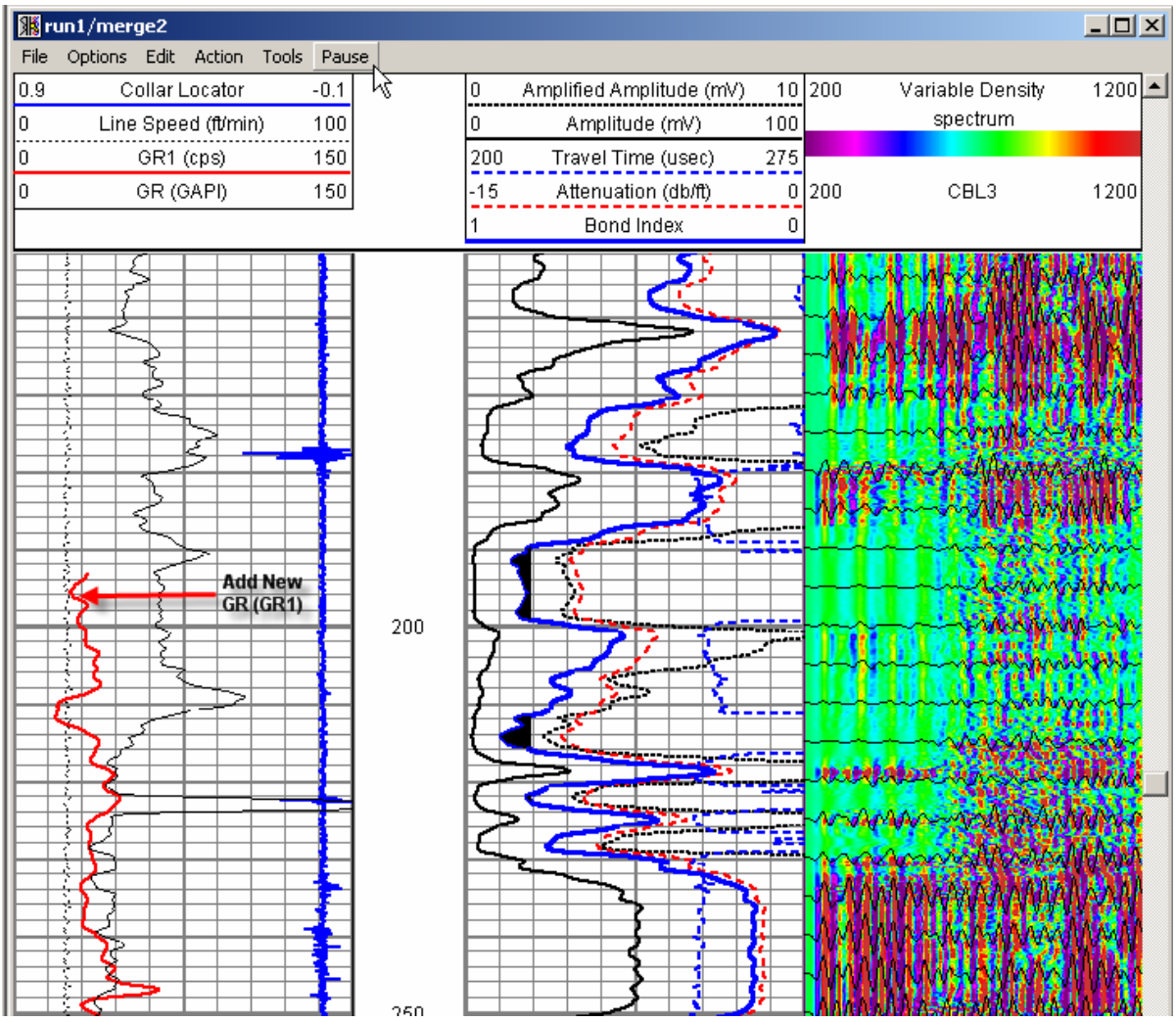


FIG: 12.19 Plot the Pass

12.2.3 Merge two Passes (Replace curve)

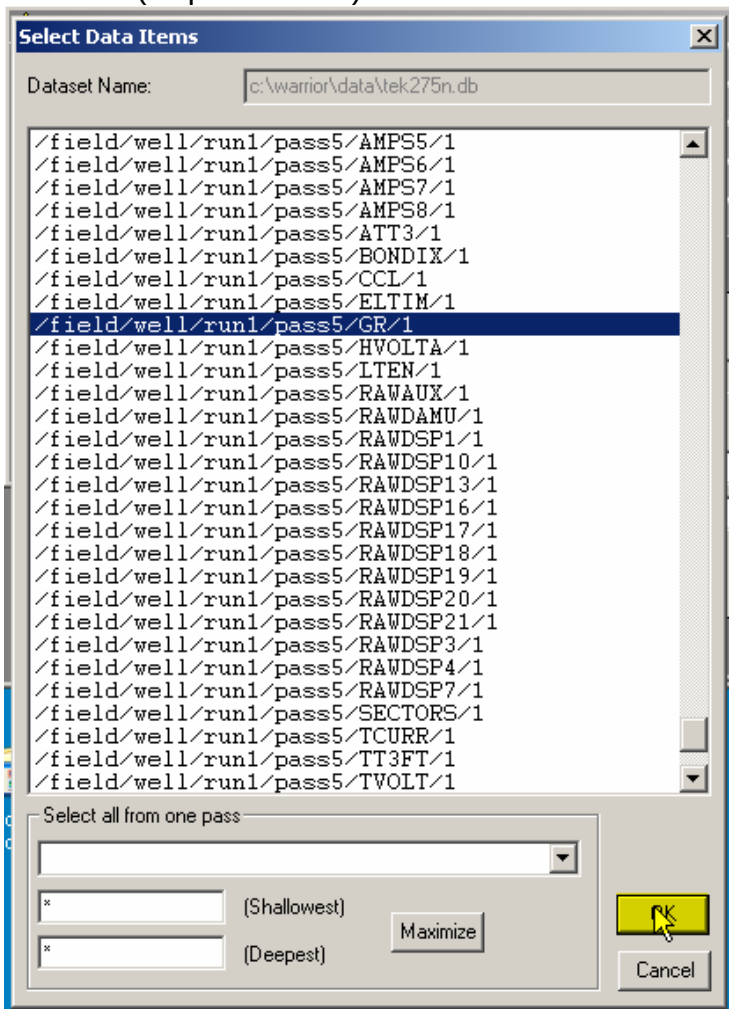


FIG: 12.20 Select Curve from the database

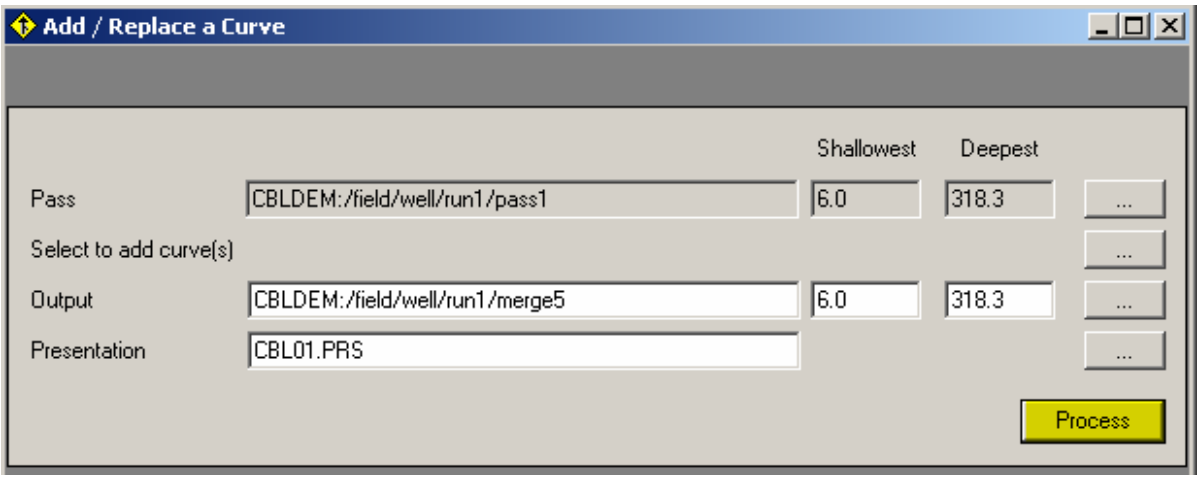


FIG: 12.21 Process

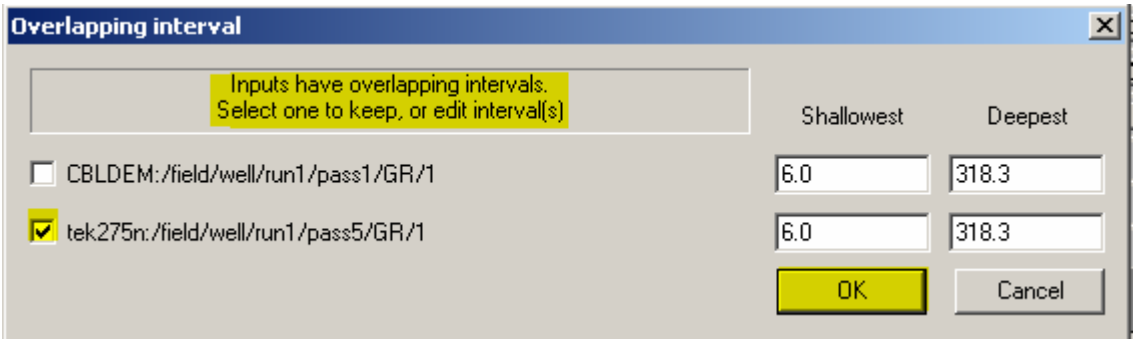


FIG: 12.22 Select the database to keep the curve

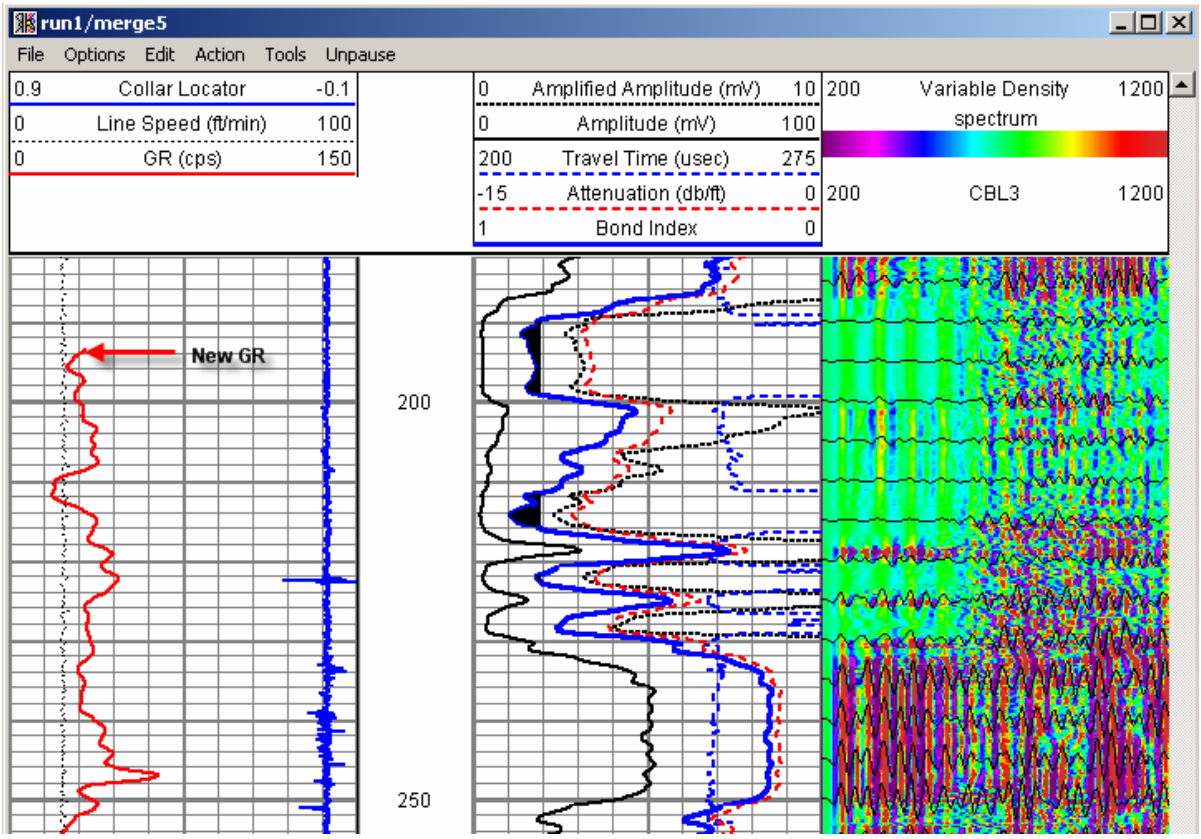


FIG: 12.23 Plot the pass with the new curve that replaced the old ones.

VIDEO: 12.1 Wizard Merge

12.2 Merge

Double-click the Merge icon in the Warrior group. The Merge Splice TVD window will appear as shown below.

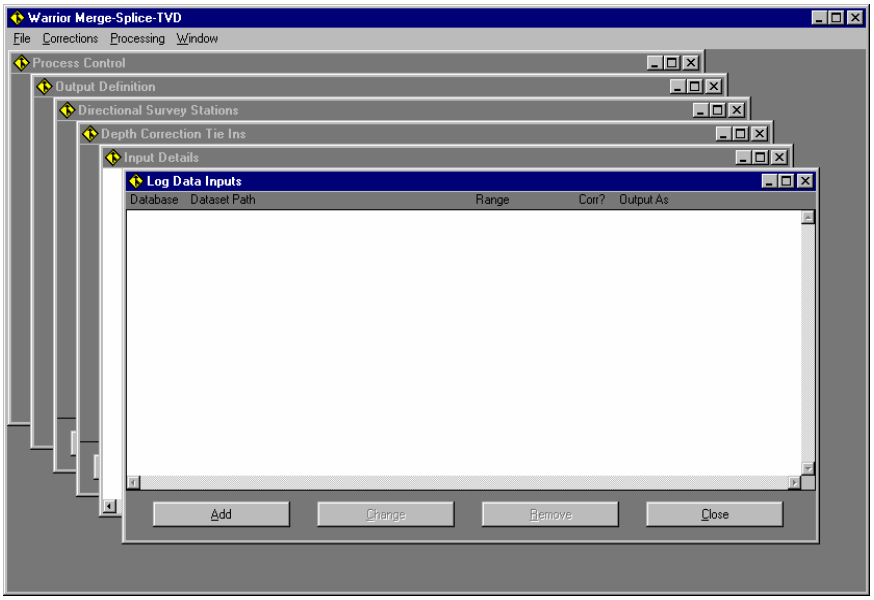


FIG: 12.24 Log data Inputs

The Merge module interface consists of six independent windows within the main Merge window. Any or all of the windows may be displayed at the same time.
Note that if you loose a window by inadvertently or deliberately closing it, you can get them all back by clicking Window/Open All in the main menu bar.
The main Merge menu box contains several pull down menus and selection options, which control the operation and set up of the Merge sub-system. The pulls down menu functions are as follows:

12.2.1 File

12.2.1.1 Select Input Log Data.

Selecting this option brings the **Log Data Input** window to the foreground. Data items e.g. curves, are selected from their source database(s) and dataset(s), and displayed as a scrolled list in the Log Data Input Window. Within the Log Data Input window several processing parameters are set.

12.2.1.2 Detail Selected Inputs

Selecting this option brings the **Input Details** window to the foreground. This window displays detailed information concerning the data items selected for processing.

12.2.1.3 Select Output Path/File

Selecting this option brings the **Output Definition** window to the foreground. This allows definition of the database and dataset to which the processed data is to be output. A default presentation, with start and stop depths, may be *associated* with the output database in this dialog also. Note that **Browse** buttons are available so that existing databases and presentation files may be easily selected.

12.2.2 Corrections

12.2.2.1 Enter Depth Tie Ins

Selecting this option brings the **Depth Correction Tie Ins** window to the foreground. Processing parameters for data depth corrections are entered in this window.

12.2.2.2 Enter Directional Data

Selecting this option brings the **Directional Survey Stations** window to the foreground. Entry of directional survey data for TVD calculations is made in this window.

12.2.3 Processing

12.2.3.1 Process Commands.

Selecting this option brings the **Process Control** window to the foreground. Three selections may be made in this window. The type of processing to be performed, if the processing is to be done as a foreground or background task, and to the default depth units are to changed.

12.2.4 Windows

Conventional Windows commands for manipulating windows on the screen

12.3 Merge data items (curves) from two (or more) log passes

If the Log Data Inputs window is not active, click on **Select Input Log Data .....**. under the **File** menu. The Log Data Input window appears in the foreground. Clicking the **Add** button brings up a file selection box where an existing log database may be selected in the usual way.
Once a database is selected the contents in terms of runs, passes, curves etc. are displayed as a scrolled list, as shown below.

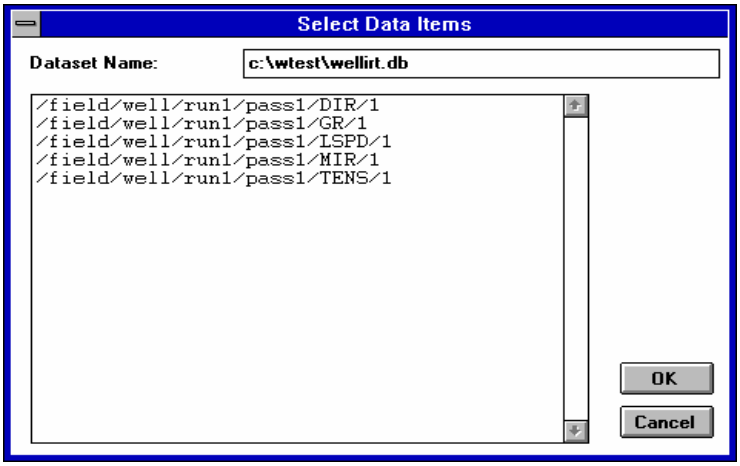


FIG: 12.25 Select Curve from the database

Select the curves and other items, present in this list that you wish to merge. When all the required curves present in the current database have been selected click **OK** and the selected items are passed to the **Log Data Inputs** list as shown below.

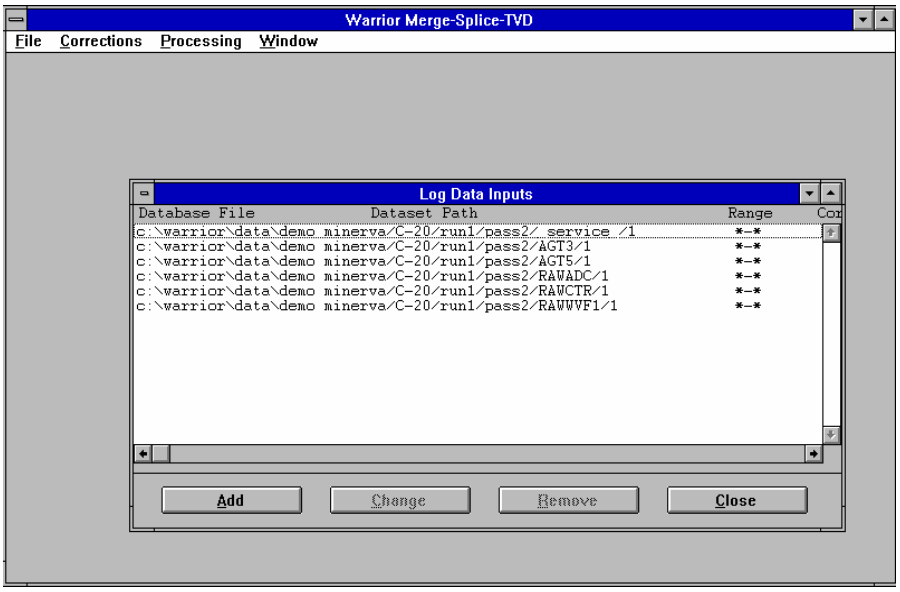


FIG: 12.26 Log Data Inputs

In the same way (**Add** etc.) curves and other data items may be selected from other databases until all the required curves are present in the Log Data Inputs window.
From within the Log Data Inputs window, details of the processing parameters for the individual data items are set. The processing parameters which may be adjusted are the depth range, the name of the output curve and the application (or otherwise) of depth corrections.
Select one or more curves from the input list by highlighting them in the normal way. Note that **Change** button is now activated.
Clicking the **Change** button brings up the **Modify Input Item** dialog as shown below.

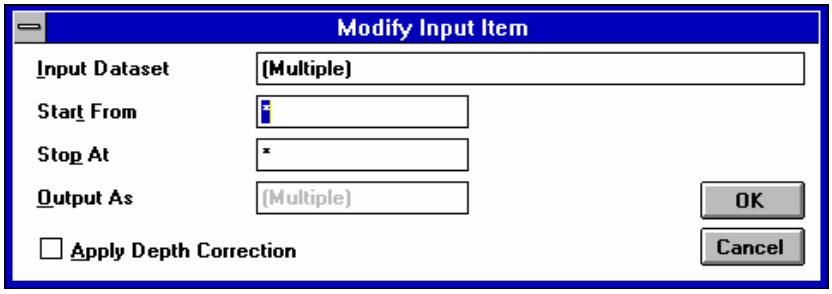
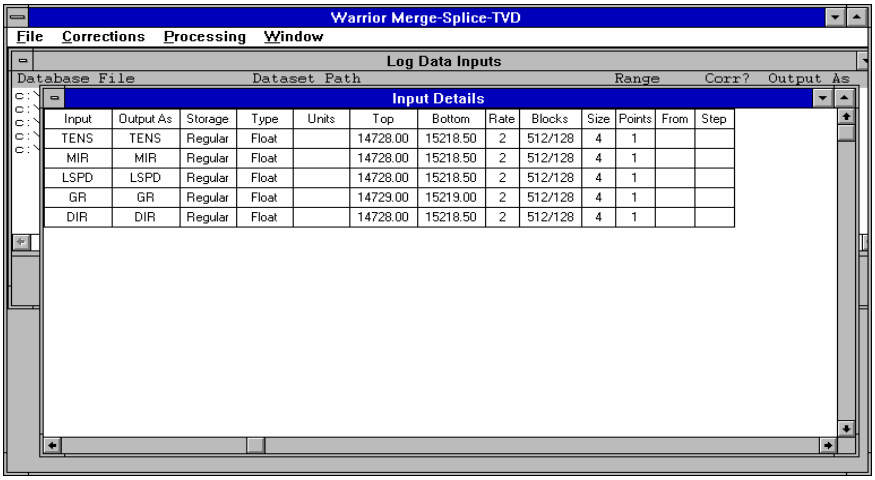


FIG: 12.27 Modify input item

If a group of curves was selected, the Input Dataset is shown as Multiple because several curves have been selected. If a single curve is selected the actual name of the curve us presented.
The depth range of the output curve(s) may be set as desired or left as the initial range. The name of the output curve may be changed only if a single curve was selected.
If depth corrections are to be applied the **Apply Depth Correction** box must be checked and depth correction tie-in points entered (see below).
Note that currently only one set of curves may be depth corrected per pass through the data. If you wish to correct more than one curve (or group of curves), where one curve (or group) has different depth corrections than the others, then tie-in points must be entered for the first group, the merge process run and then the second curve (or group) selected, the second group of tie-ins entered, and a second merge process run.
Detailed information on all data items in the Log Data window is present in the Input Details window.

12.4 Access detailed information on data items.

Select Detail Selected Inputs from the File menu. A new window is generated as shown below. A variety of information is shown about all the curves selected for processing. The horizontal and vertical scroll bars are used to access all the available information.



Input	Output As	Storage	Type	Units	Top	Bottom	Rate	Blocks	Size	Points	From	Step
TENS	TENS	Regular	Float		14728.00	15218.50	2	512/128	4	1		
MIR	MIR	Regular	Float		14728.00	15218.50	2	512/128	4	1		
LSPD	LSPD	Regular	Float		14728.00	15218.50	2	512/128	4	1		
GR	GR	Regular	Float		14729.00	15219.00	2	512/128	4	1		
DIR	DIR	Regular	Float		14728.00	15218.50	2	512/128	4	1		

FIG: 12.28 Input Details

12.5 Enter depth tie in points

Select **Enter Depth Tie Ins....** bringing up the **Depth Correction Tie Ins** dialog as shown below**.**

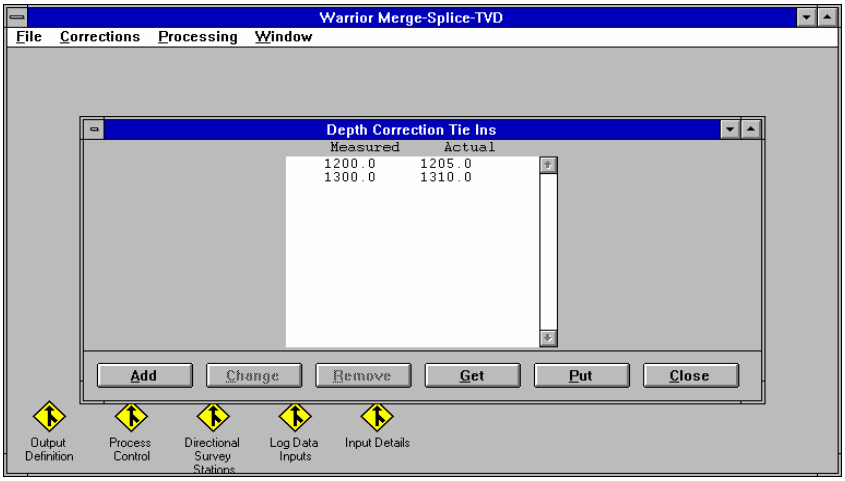


FIG: 12.29 Depth Correction Tie Ins

Depth tie in points may be entered from the keyboard by first clicking the **Add** button to obtain the window shown below

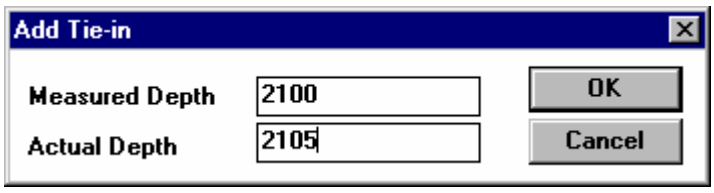


FIG: 12.30 Add Tie-in

Enter the current log depth in the Measured Depth box, and the depth to which you wish to move those log points in the Actual Depth box. Click OK and the points appear in the scrolled list. The Add Tie-in window continues for entry of the next tie-in point. When all tie-in points have been entered, click Cancel.
The log interval below the lowest tie-in point will be linearly shifted up or down, and by an amount corresponding to the lowest tie-in values.
The log interval above the highest tie-in point will be linearly shifted up or down, and by an amount corresponding to the highest tie-in values.
The log data between tie-in points will be linearly stretched or squeezed according to the tie-in values.
Note that if only one tie-in point is entered then all the log data will be linearly shifted up (or down) according to the tie-in values. The same result may be achieved much more quickly by using the Apply Linear Shift to a Dataset or Apply Linear Shift to a Data Item functions in the Utilities package.
Tie-in points mat be read from and written to a file using the Put and Get buttons. Points may be changed or removed using the corresponding buttons.
Once the changes have been made to the input data, it is necessary to indicate where the merged data is to be written.

12.6 Select the output path or file name.

Choose Select Output File/Path from the File menu. The dialog box shown below appears. The output database and dataset are typed in from the keyboard, or an existing database is selected using the Browse button.
Note that it is usually quicker to select an existing dataset with the Browse button and then modify its name and/or dataset path, than to type in all of the fields from scratch.
A default presentation file may be attached to the output dataset with a depth range defined in this dialog.
The Browse button may be used to select an existing presentation file from those in the system.

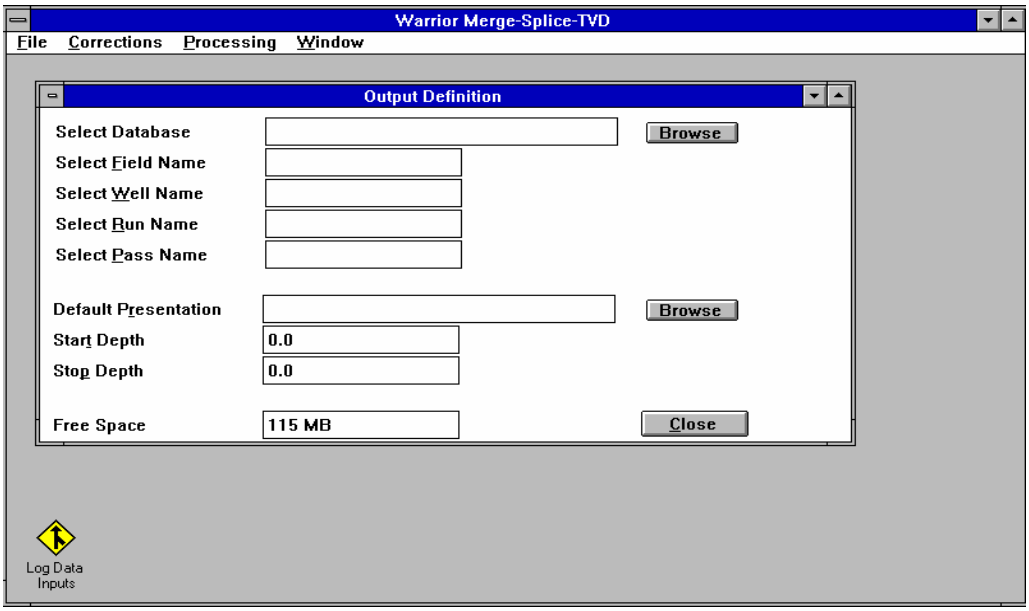


FIG: 12.31 Output definitions

The final step in merging the data is to define the processing operation, the processing mode and the depth units (if other than default).

12.7 Select processing options and start processing

Select Process Commands bringing up the Process Control Window as shown below.

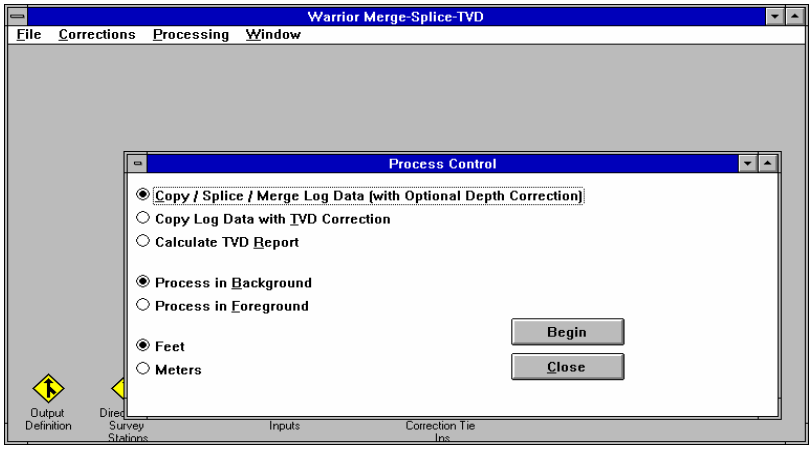


FIG: 12.32 Process Control

Select the Copy / Splice / Merge Log Data to process the data with optional depth corrections. Select Copy Log Data with TVD Correction to generate a new set of log data with depth referenced to TVD calculated from the directional survey data. Select Calculate TVD Report to generate an ASCII directional report.
Process in Foreground causes the processing to take place in Windows foreground mode, whilst Process in Background allows processing to take place whilst other tasks, such as logging, are active.

12.8 Splice a curve

Select first input database as described above. Select the first section of input curve to be spliced from the Select Data Items window, then select the second and so on until all the original curves from which the spliced curve is to be assembled are present in the Log Data Inputs window. The original curves may originate from one or more databases.
Select the first curve and input depth range of this curve to be used in the spliced curve e.g. 1200, 1300. Select the second input curve and set its range e.g. 1300, 1400. Select the third input curve.
When all the sections have been defined go to Output Definition and define where the new curve is to written, as described above. Process Control, select the Copy / Merge...option and click Begin.

12.9 Enter Directional Survey Data

Select Enter Directional Data. bringing up the Directional Survey Stations window as shown below. The depth, borehole inclination, and azimuth are entered in a manner similar to the depth tie in data. The Add, Change, Remove, Get, Put and Close buttons are used in the same manner as previously described for Depth Correction.

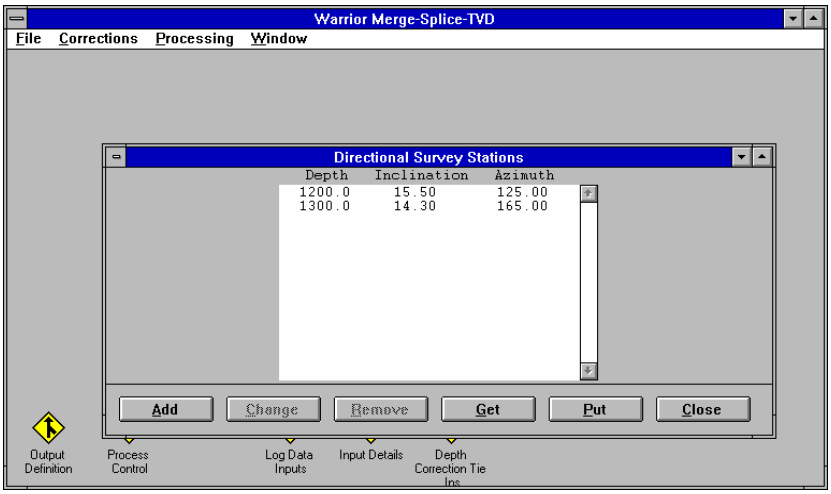


FIG: 12.33 Directional Survey Stations

Once the data items have been selected, the destination file chosen and the processing parameters defined, the Processing menu or Process Control window may be selected to initiate processing of the data as previously described.

The **Window** menu functions are identical to those found in any Windows application, allowing the individual windows e.g. Process Control, Log Data Inputs etc., to be tiled, cascaded, etc., as shown below.

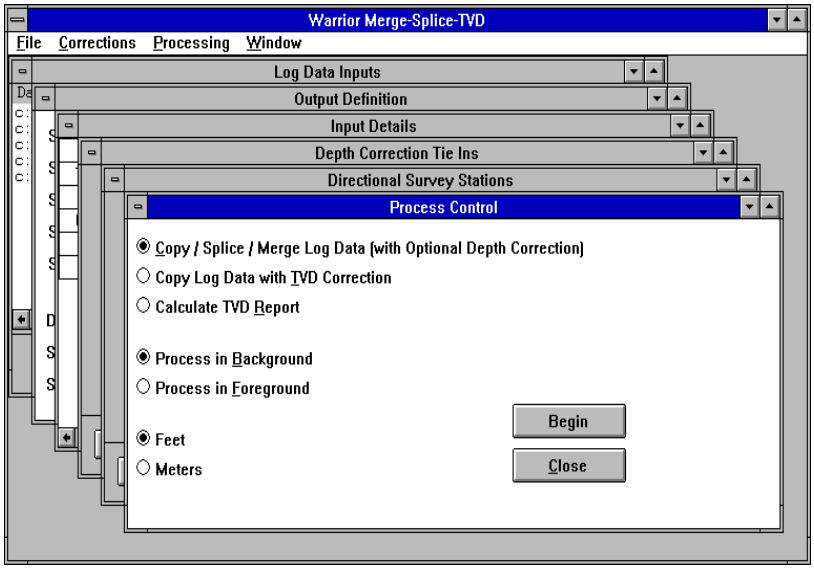


FIG: 12.34 Process Control

Note that the interface to the Merge program may be customized by the user in terms of window sizes and layout. The layout in existence at the time the program is closed will be brought back the next time the program is run.

Section

13

13 Utilities

The Utilities icon in the Warrior Program Group allows access to several programs, some with general, and some with more specific, applications.

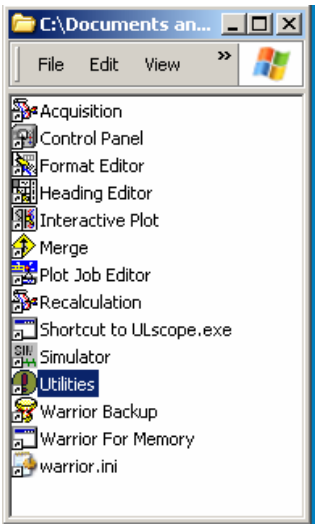


FIG: 13.1 Warrior Program Group

The warrior Utilities has six modules:

1) Data Export
2) Interpretation Tools
3) Data Import
4) Depth Correction
5) Data Management
6) Setup Tools

Clicking on the icon Utilities gives a menu list as shown below.

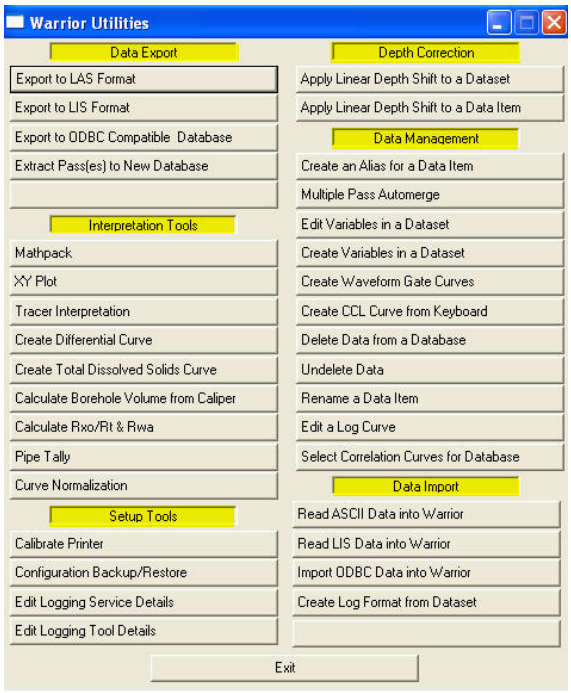


FIG: 13.2 Warrior Utilities

13.1 Data Export

13.1.1 Export to LAS Format

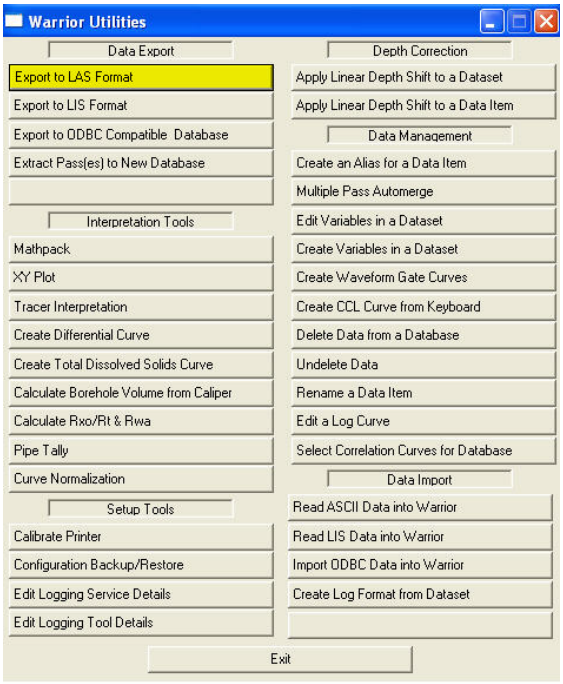


FIG: 13.3 Export LAS Format

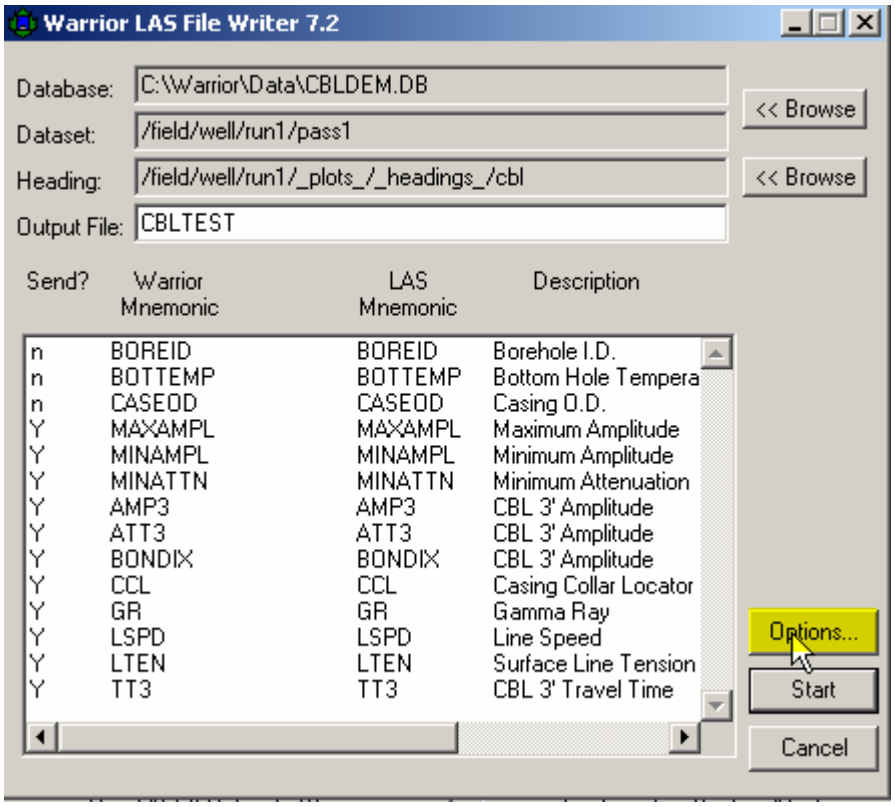


FIG: 13.4 Select Database, Data Set, Heading

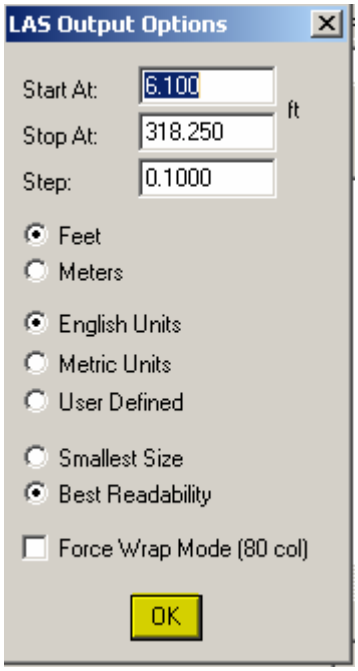


FIG: 13.5 Set LAS Outputs

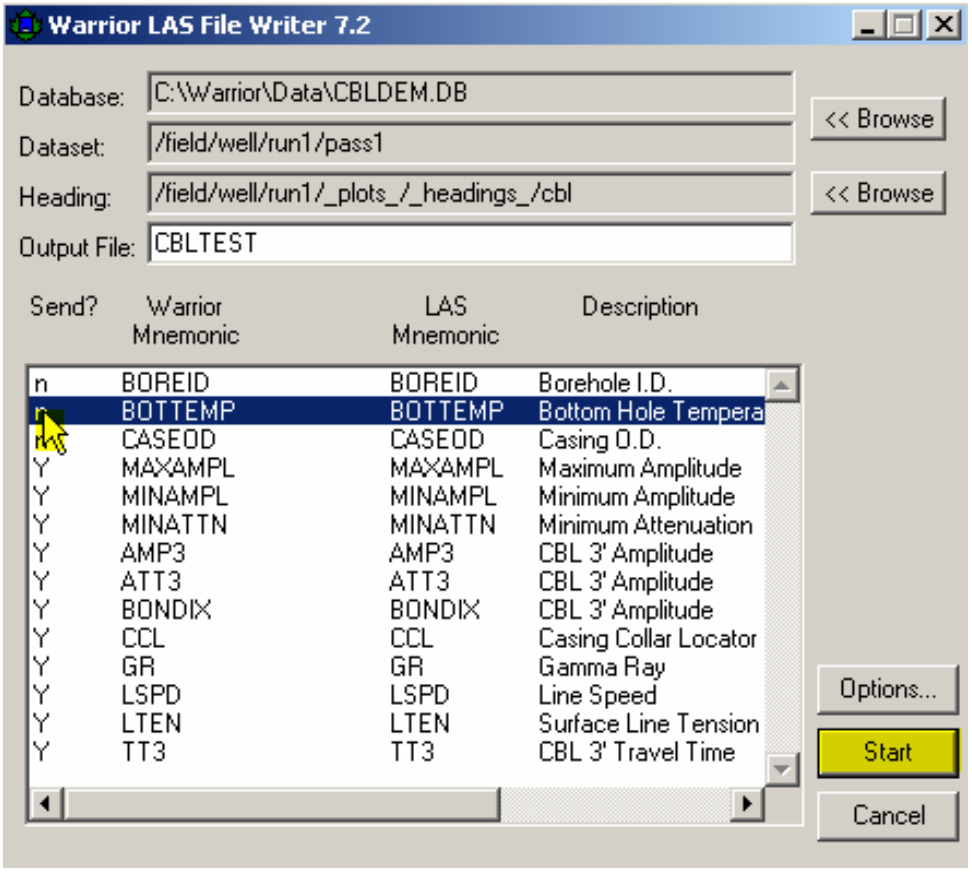


FIG: 13.6 Select curves Y/N and Start

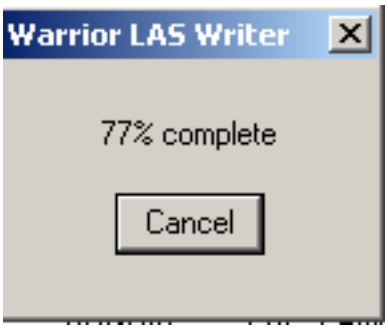


FIG: 13.7 Processing

VIDEO: 13.1 Export LAS

13.1.2 Export to LIS Format

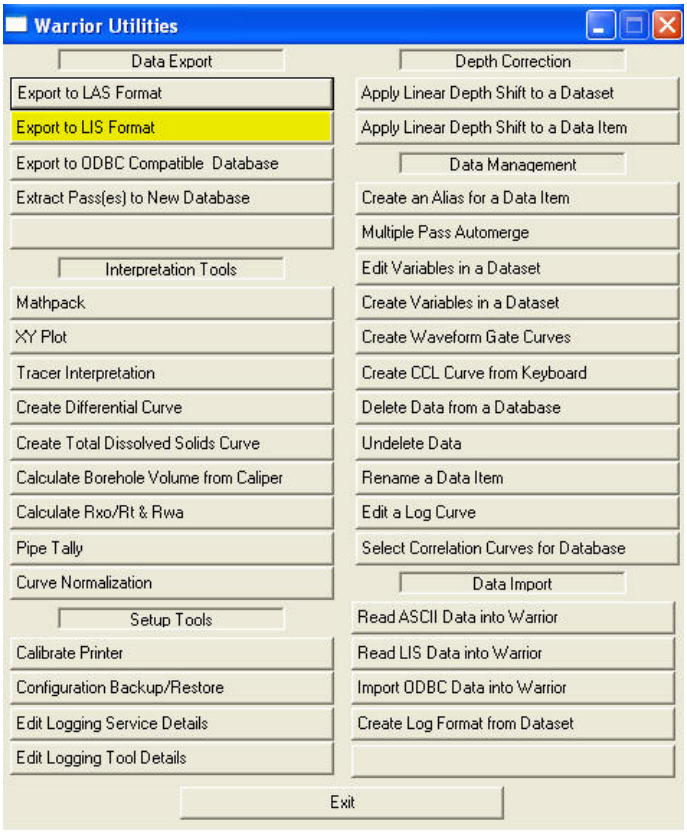


FIG: 13.8 Export to LIS Format

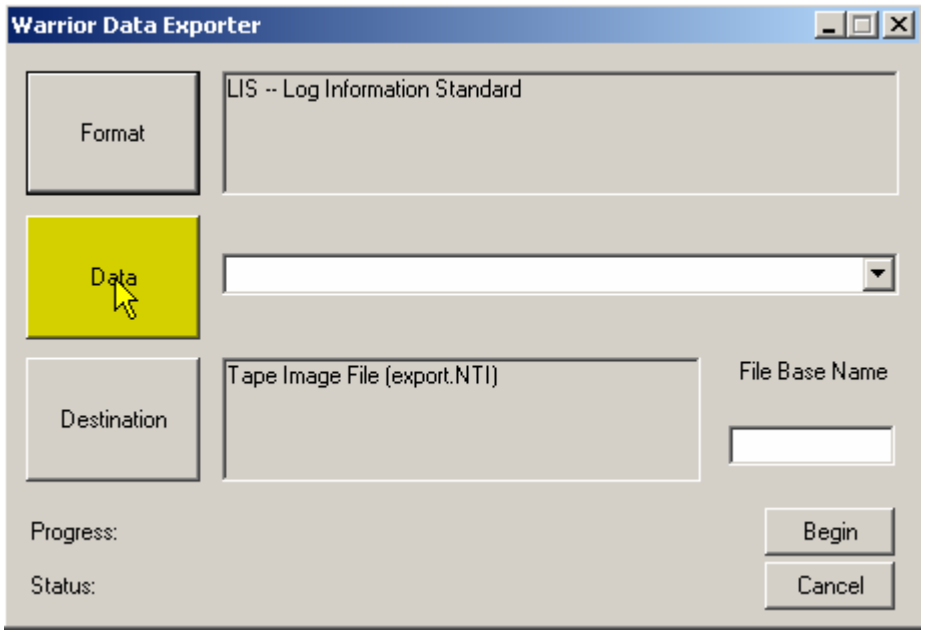


FIG: 13.9 Select DATA to Built the LIS

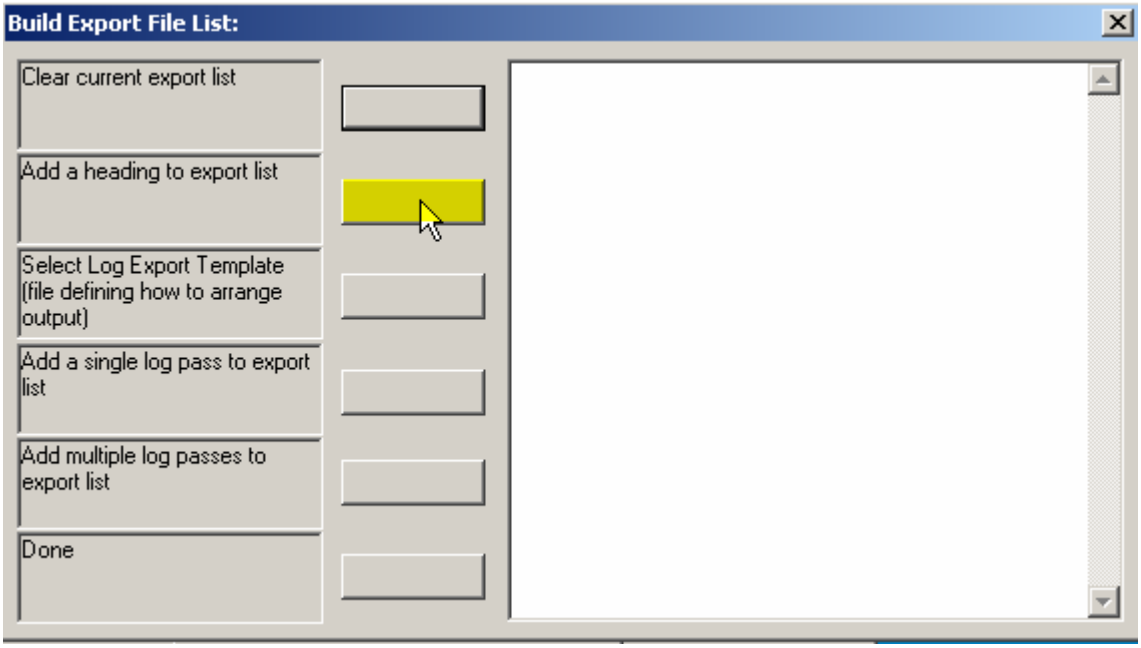


FIG: 13.10 Add a Heading to export list

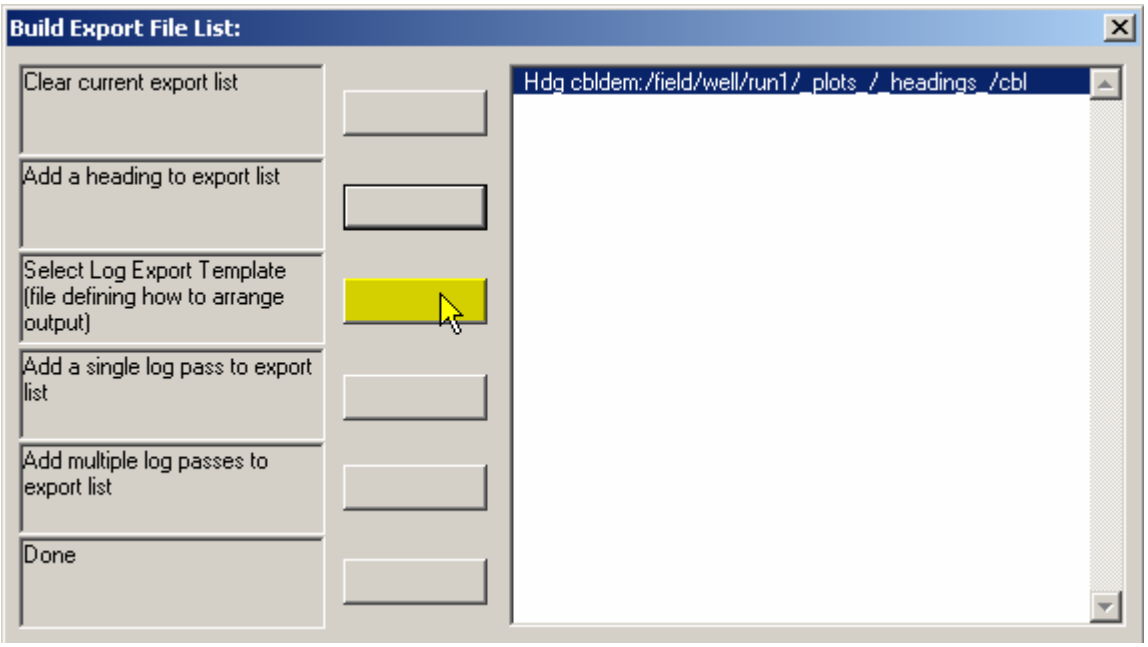


FIG: 13.11 Select Template (*.LET)

13.1.2.1 LET Files

LET files are used to define the output data for Warrior LIS Exporting (LIS Export Template).
This needs to be a sequentially numbered set of outputs. All outputs from a log pass do not have to be listed, but only those listed will be output into the LIS file

13.1.2.1.1 First Item

The first item in the list must be number [0]. This defines the title and frame spacing or output rate. The title is used for information only. The Frame Spacing is followed by one to three parameters. The first parameter is the out rate in inches if the rate is in feet. The second parameter is the output rate in Millimeters if the rate is in meters. The third parameter is the output rate in seconds if it is a time drive log.

Example:

```
[0]
Title=CBL Export
FrameSpacing=3,77,.1
```

13.1.2.1.2 Data Items

Each data item output must be listed with an InputName that is shown as the mnemonic used in the Warrior database. OutputName is optional, but should be used if the input name is longer than 4 characters, otherwise the input name will be truncated to the first 4 characters. LIS Standard is no mnemonic longer than 4 characters. The SampleSpacing is optional. This is used if a rate different than the FrameSpacing is required. It has the same three parameters as the FrameSpacing listed above.

Example:

```
[2]
InputName=CCL
OutputName=CCL
SampleSpacing=1.2
```

13.1.2.1.3 Last Item - Depth

The last data item should be DEPTH. Note that since Depth is 5 characters, it will automatically be truncated to DEPT, but it is standard to show the output name as DEPT.

Example:

```
[8]
InputName=DEPTH
OutputName=DEPT
```

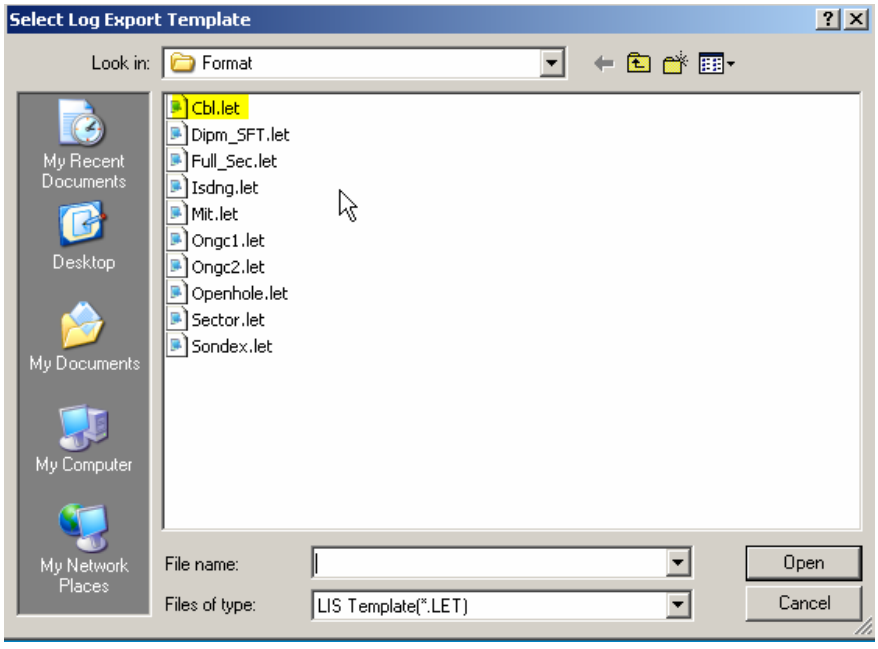


FIG: 13.12 Select Log Export Templates

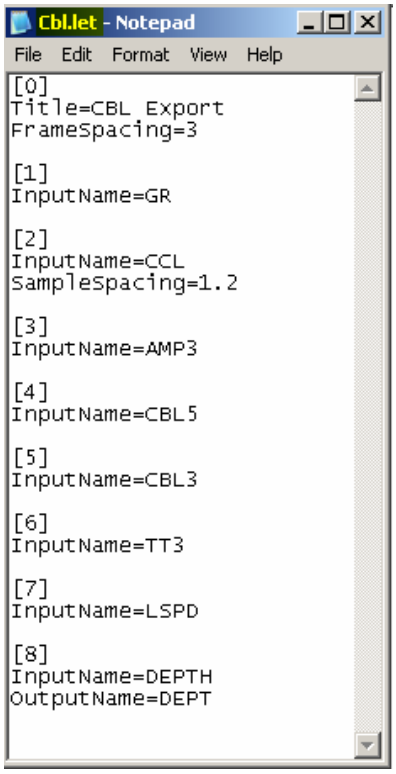


FIG: 13.13 Open with Notepad the CBL.let file

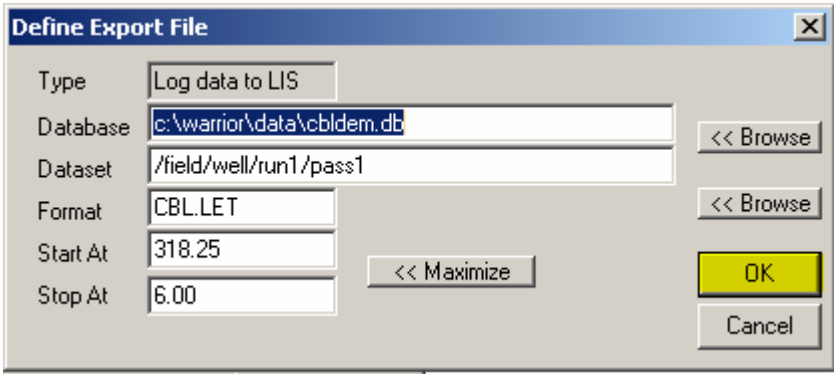


FIG: 13.14 Setup the Export File

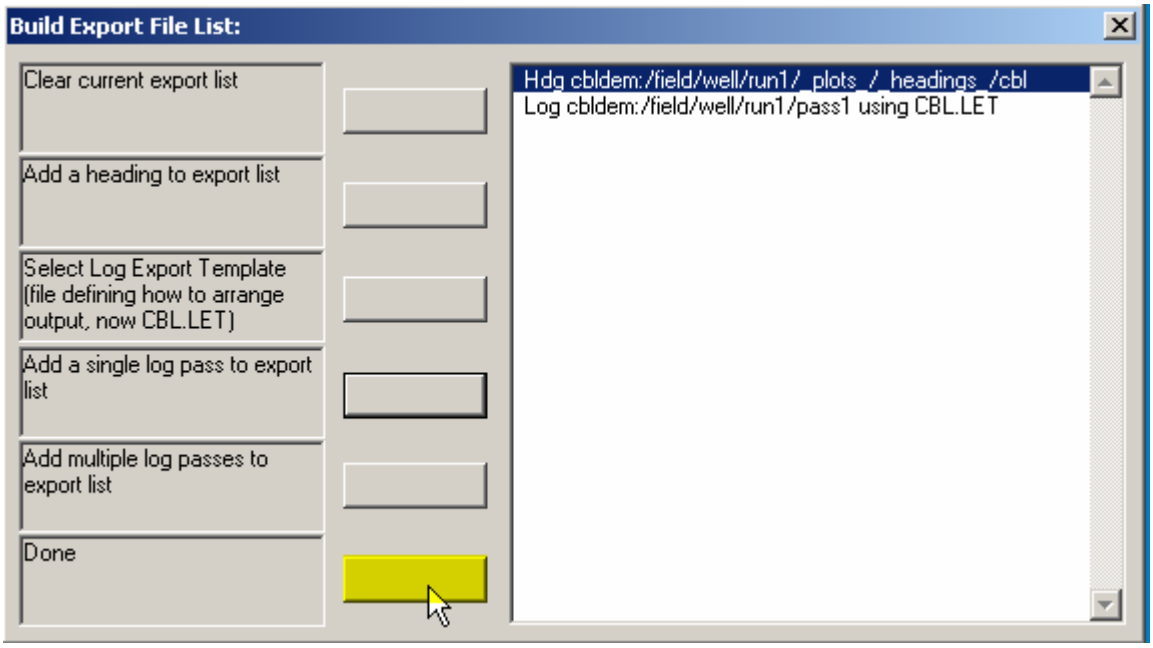


FIG: 13.15 Build Export File List

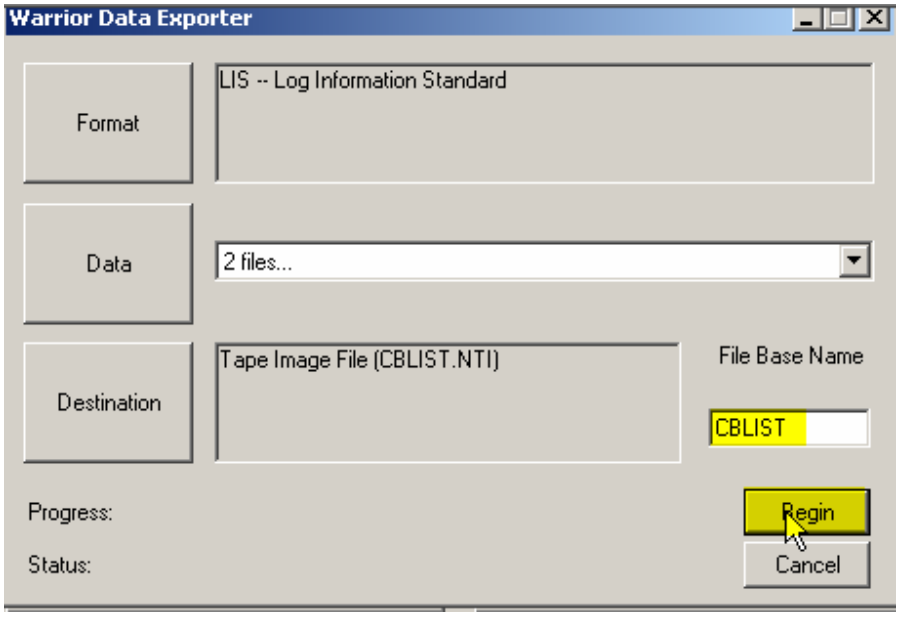


FIG: 13.16 File Base Name

VIDEO: 13.2 Export to LIS

13.1.3 Export to ODBC compatible Database

This program will export data for Excel, Access, FoxPro and other ODBC compatible databases. The limit for exporting data is 255 data points per sample. A normal curve is one data point but a waveform will be many more points for each sample. You will see a message in the progress window that the column count has exceeded if you exceed that amount.

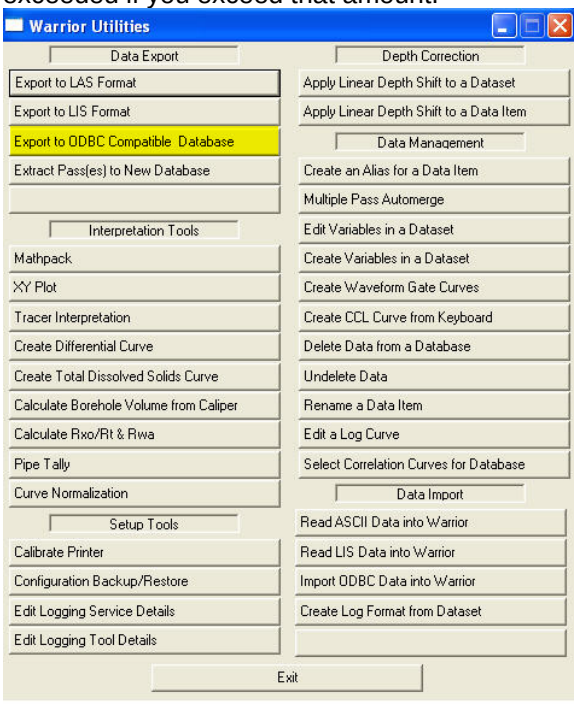


FIG: 13.17 Export to ODBC Compatible Database

13.1.4 Extract Pass (es) to New Database.

FIG: 13.18 Extract Pass(es) to New Database

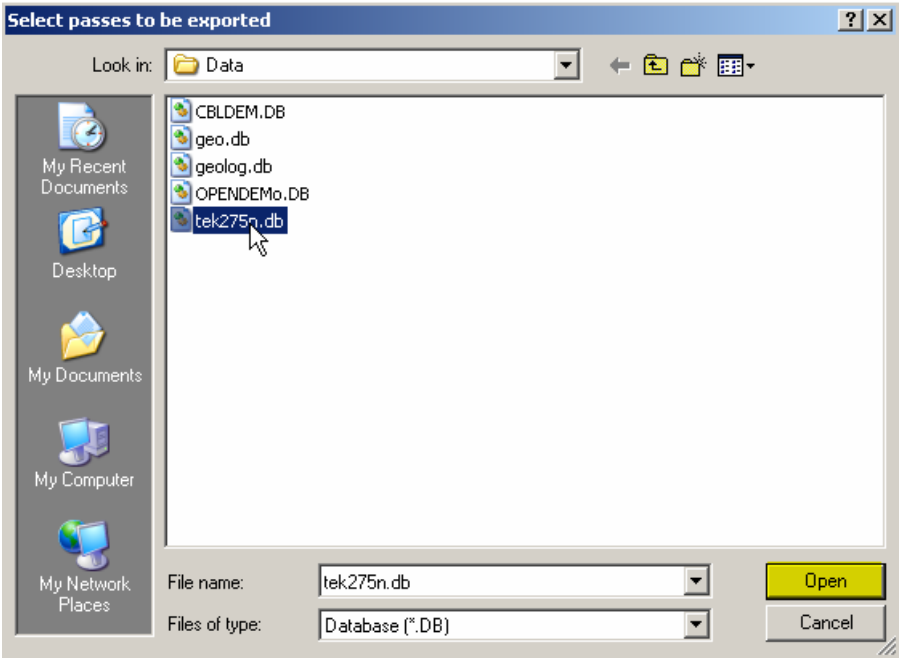


FIG: 13.19 Select Database

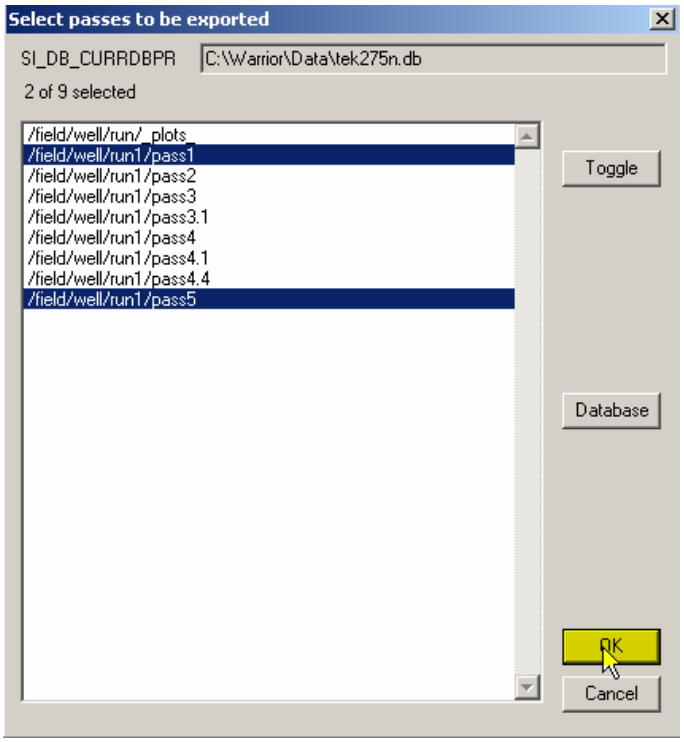


FIG: 13.20 Select Pass(es)

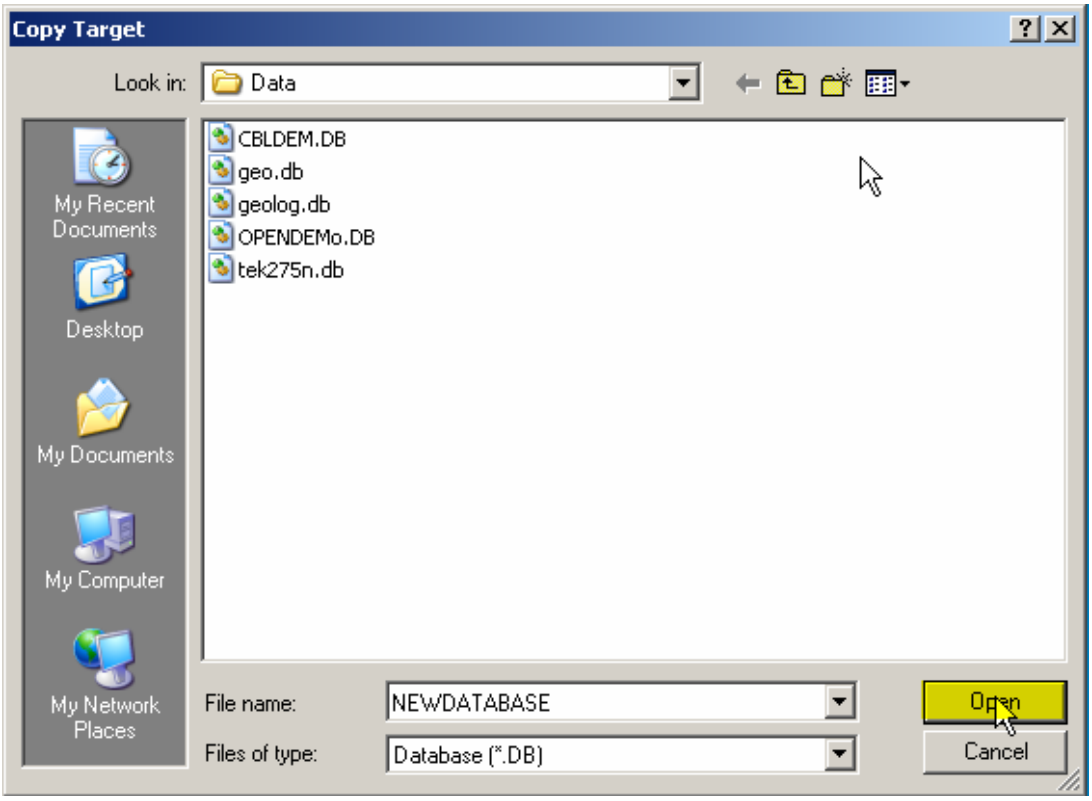


FIG: 13.21 Copy Target

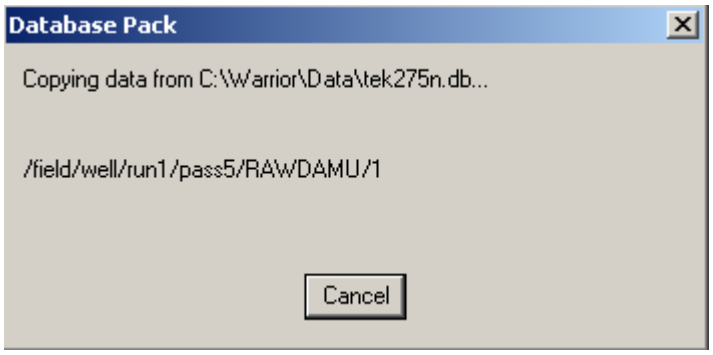


FIG: 13.22 Packing

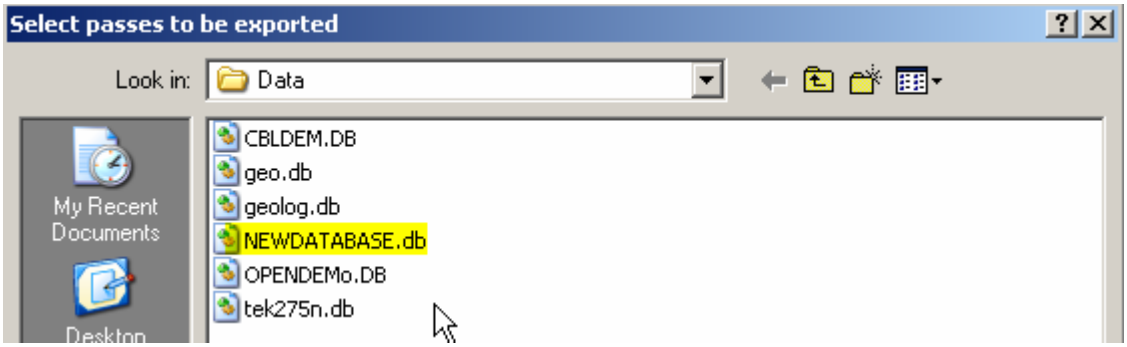


FIG: 13.23 Check the Database Target

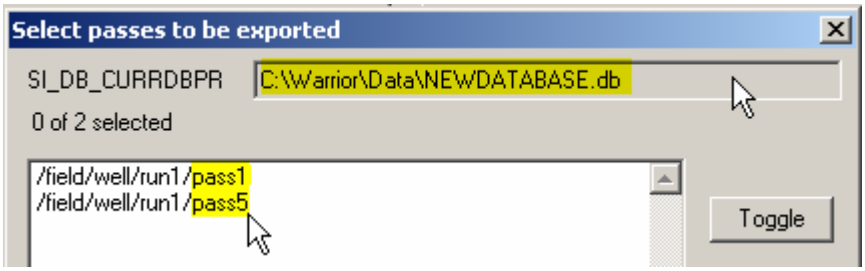


FIG: 13.24 View Passes in the Target

VIDEO: 13.3 Extract Pass(es)

13.2 Interpretation Tools

13.2.1 Mathpack

See section 15

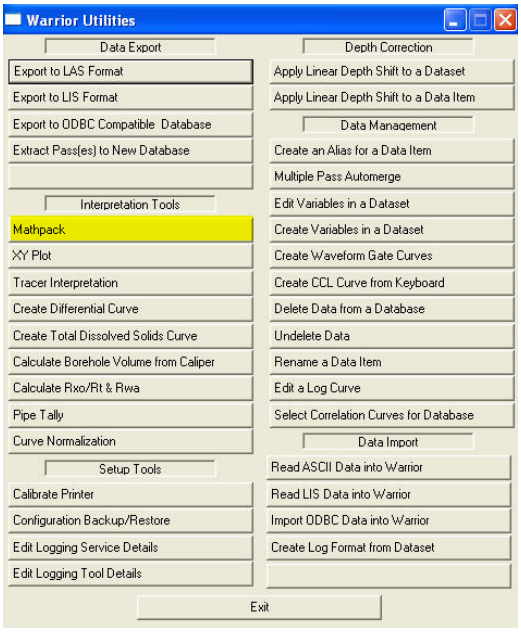


FIG: 13.25 Math Pack

13.2.2 XY Plot

A cross plot will consist of one or more curves. Each curve will be created by plotting one database item plotted against depth or time or from one database item plotted against another database item.

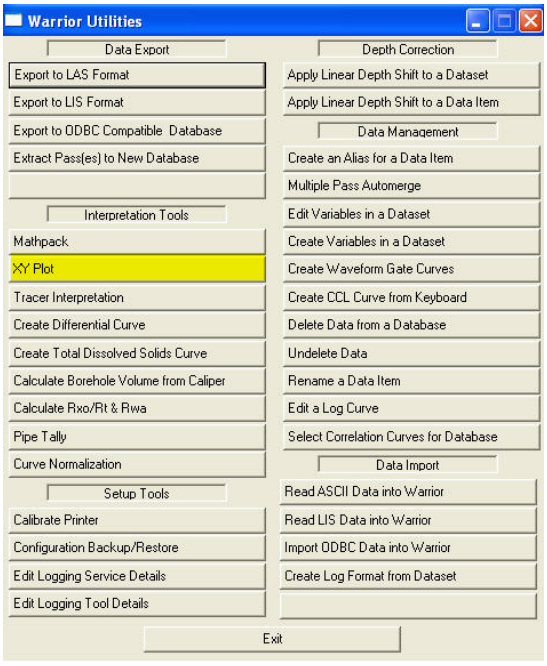


FIG: 13.26 XY Plot

Select **File/New** or the **Create a new plot** icon to create a cross plot. Select **Add Curve** to create each curve. Each curve name will increment by 1 as you add curves. Select **Delete Curve** to delete the selected curve from the plot.
To set up the cross plot you must first select what will be plotted on each axis. If depth or time is selected to plot on the x-axis, then no item will be selected to plot on the x-axis. Next select what database item(s) to plot by selecting the X - Axis or Y - Axis buttons. If you want to plot one database item vs. another, the items do not have to come from the same pass, but they must both be recorded on depth or both be recorded on time. Also the items must have an overlapping depth or time interval to plot from.
Once the plot setup is complete select the **OK** button, and the plot will start. The scaling will be done automatically. To change how the plot is scaled select **Edit/Scaling**.
The plot can be made real-time, and if the auto-scale option is used, the plot will resize automatically to fit all of the data points as needed.

13.2.2.1 Scaling

A separate axis will be drawn for each curve unless the option **Overlap scales for each curve** is selected. If the auto-scale option is selected for the x or y axis, the left, right and/or top, bottom scales will automatically be calculated to fit all of the data within the plot. If it is not selected, you can enter the scales yourself. If only one database item is selected to plot, then one of the axis will be depth or time.
When plotting two database items, there is a depth or time scaling option. It can be auto-scaled or a range can be selected. The scales for the depth or time must be within the recorded range of the interval being plotted.
The x and y origin is defaulted to (0,0). If the origin is outside the range of data being plotted, then the origin will be moved to the bottom left corner of the plot.
The X and Y ticks give an approximate count to the number of gridlines that will be shown on that axis. The gridlines will attempt to be drawn at an integral distance apart, so the displayed ticks may not be the same as what are requested.
Sometimes it may not be appropriate to draw a line to connect each data point. To make a dot for each data point, deselect the option "Draw a line between plotted points".

13.2.2.2 Plotting

If the plot is being created as the data is being collected, then the **Start Plot** button will change to **Stop Plot**. Press the **Stop Plot** button to halt the plotting. If the data collection continues, then press Start Plot to plot the entire collected interval again. Starting the plot in the middle of data collection will plot over the interval as described in Scaling.

13.2.2.3 Annotations

To create an annotation, select **Annotations/Create** or click on the "<-ab" annotation button in the toolbar. When the annotation button is depressed, an annotation can be added. When the cursor is moved in to the plot area, the cursor will change to indicate the type of annotation that will be added. Right click on the mouse to change the annotation type. Left click to place the annotation on the plot. Type in the text for the annotation while the annotation is highlighted. To move an annotation, click and hold the left mouse button and drag the annotation to the appropriate position. To delete an annotation, left click on the item to be removed. When it is highlighted, press the delete key. To edit an annotation, left click on the item and then type in the new text.

13.2.2.4 Zoom

Select the Zoom in, Zoom out buttons to change the cursor to a magnifying glass. Then select the area of the plot to magnify. To set the plot back to it's default size, select the Auto scale button.

13.2.2.5 Save and Restore

When saving the cross plot, two items can be saved. First the cross plot can be saved to a Warrior database to be plotted with pplot. Second, the plot setup can be saved and restored at a later time

with the cross plot program. Saving the setup does not save the plot itself - it only saves the curve(s) being plotted and the setup used to create the plot.
The plot heading is only seen when the plot is printed. It can accept multiple lines by hitting the enter key at the end of each line.

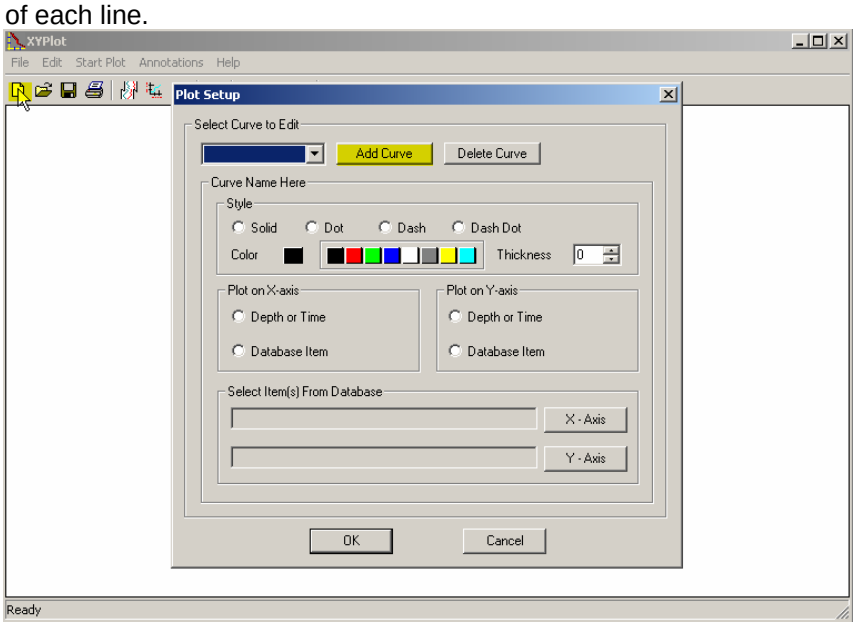


FIG: 13.27 Plot setup

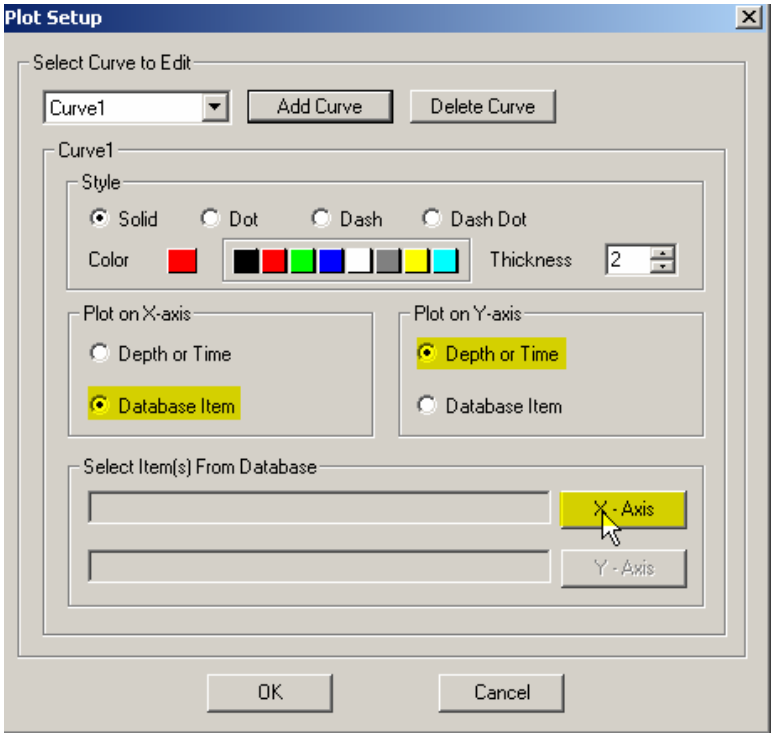


FIG: 13.28 Setup Axis

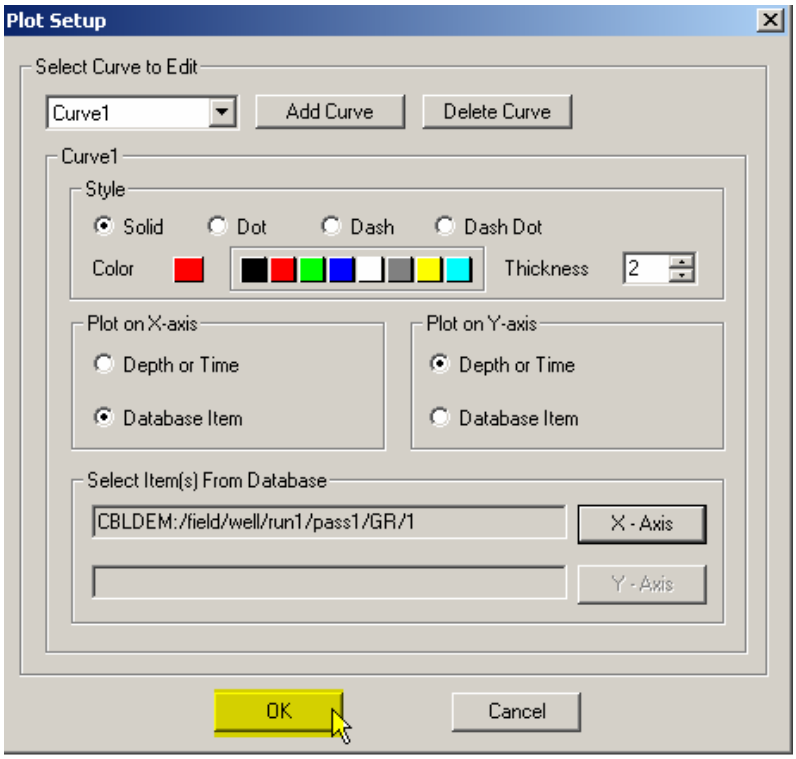


FIG: 13.29 Select database and Curve

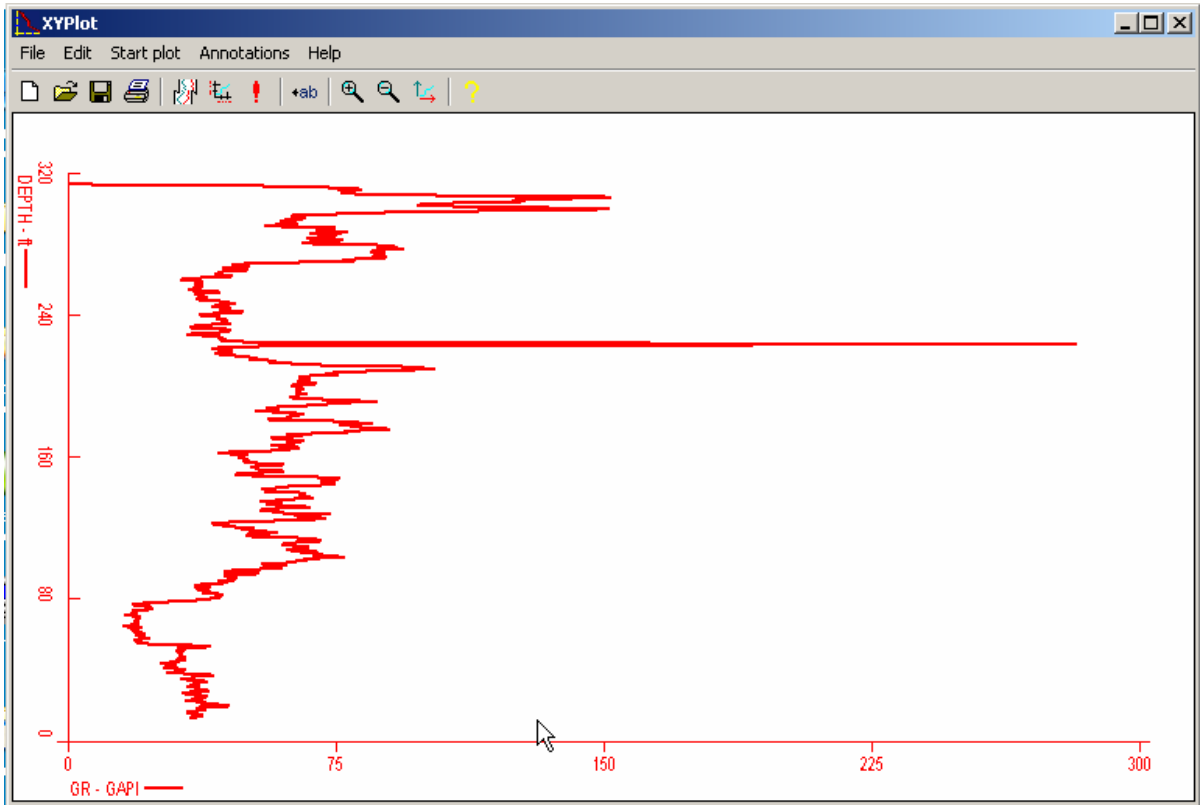


FIG: 13.30 XYPLOT

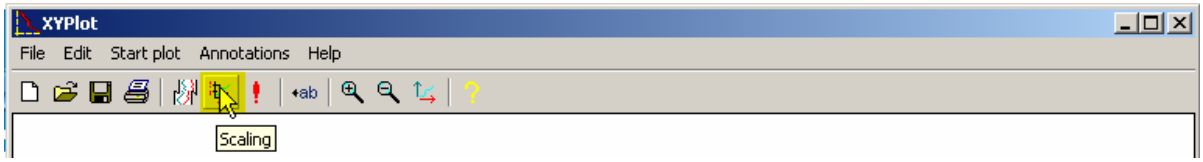


FIG: 13.31 XYPlot Scaling

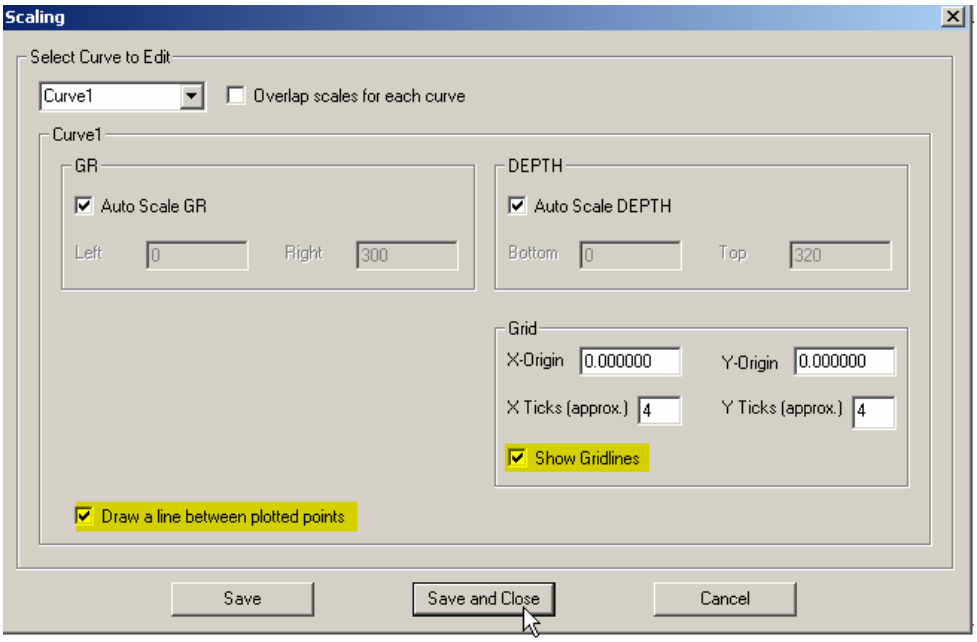


FIG: 13.32 Edit Curve setting

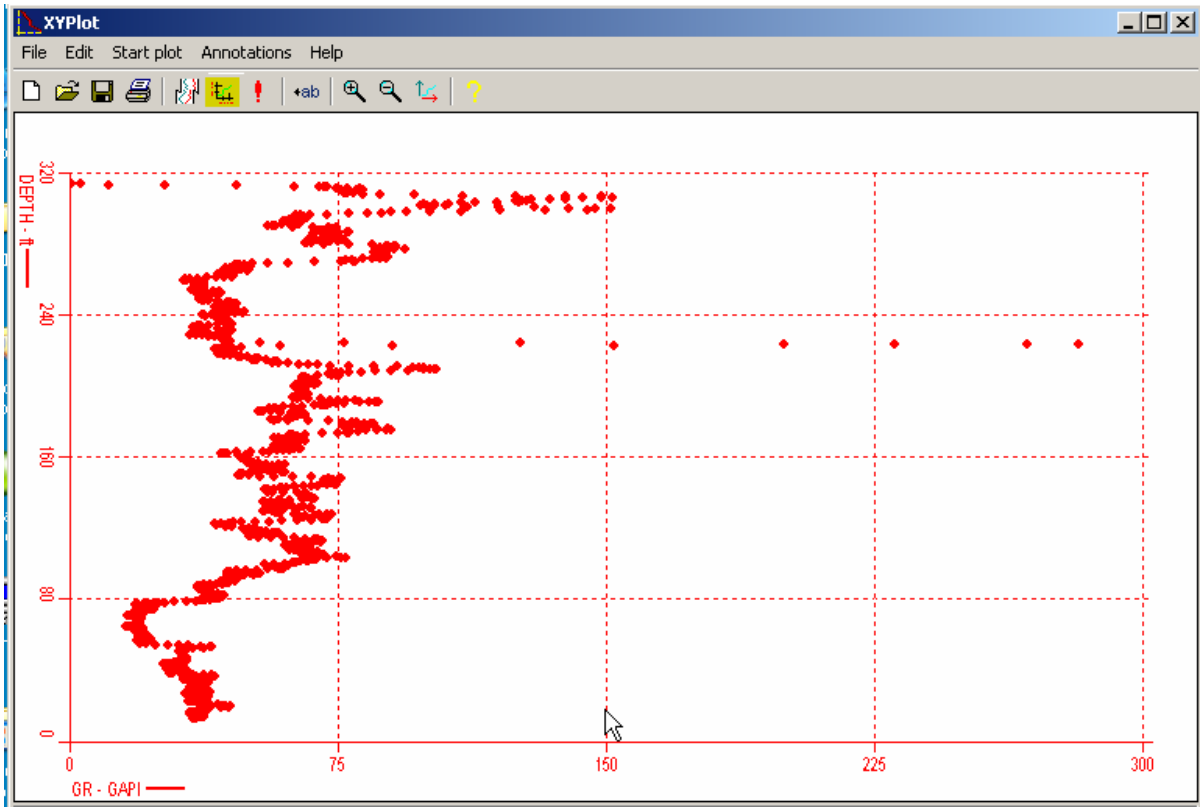


FIG: 13.33 XYPlot with new setting

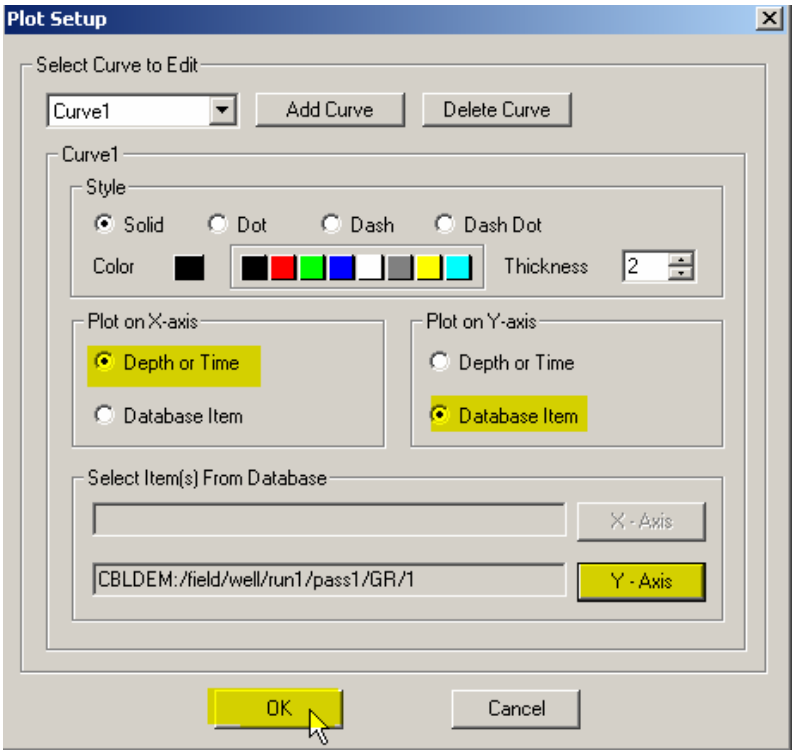


FIG: 13.34 XYPlot Change Axis

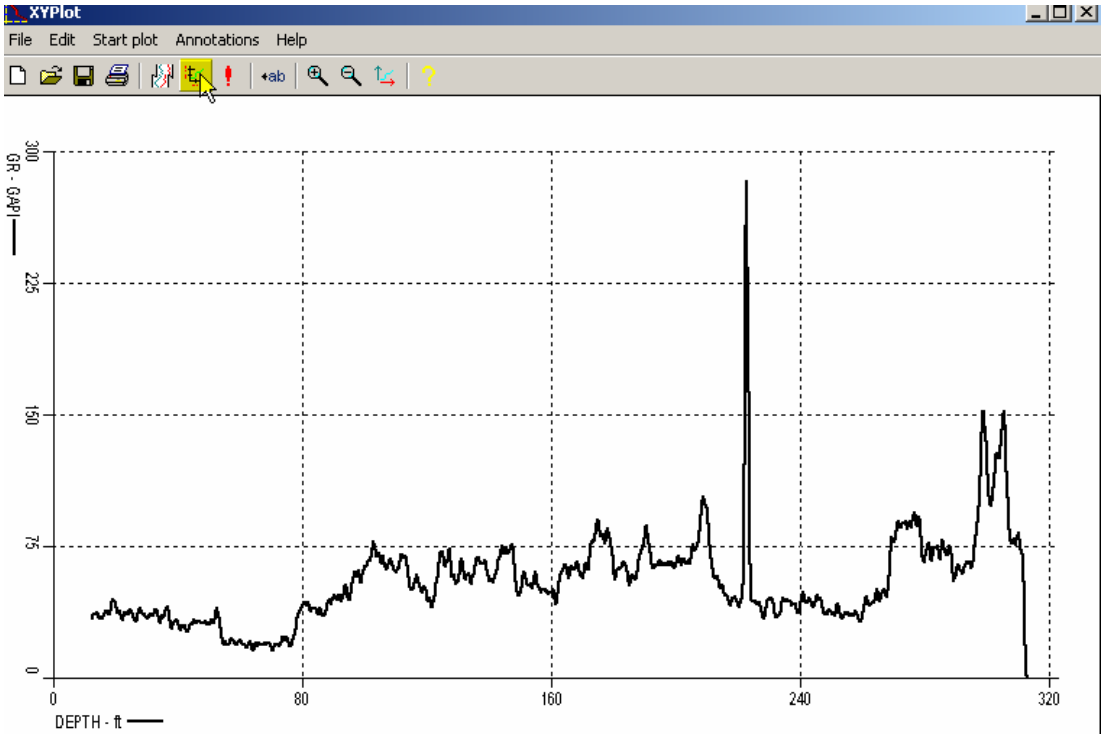


FIG: 13.35 XYPlot

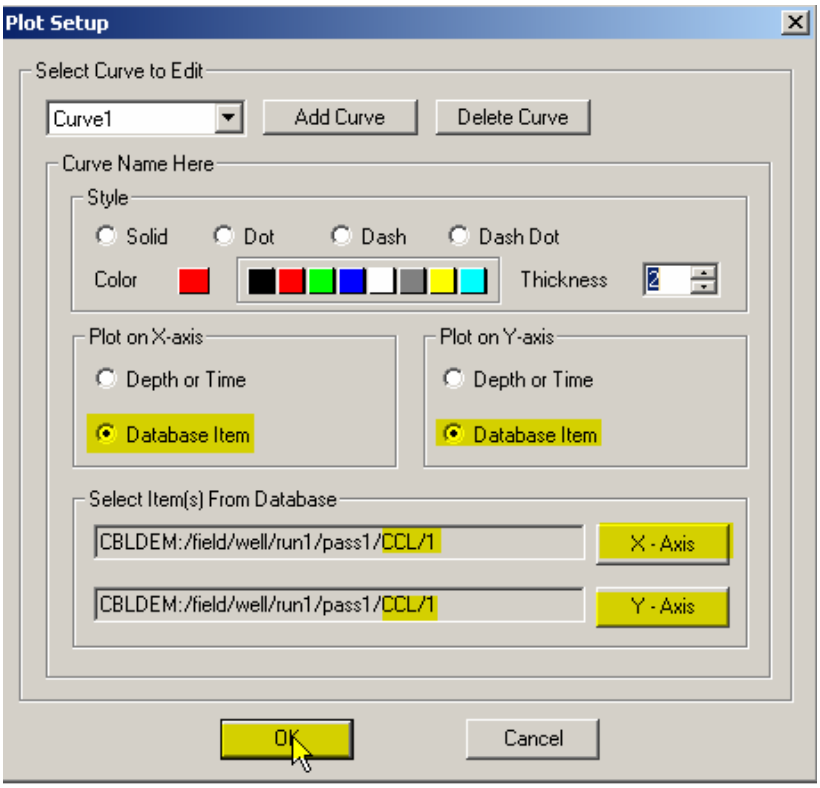


FIG: 13.36 XYPlot setup (X/Y) for two curves

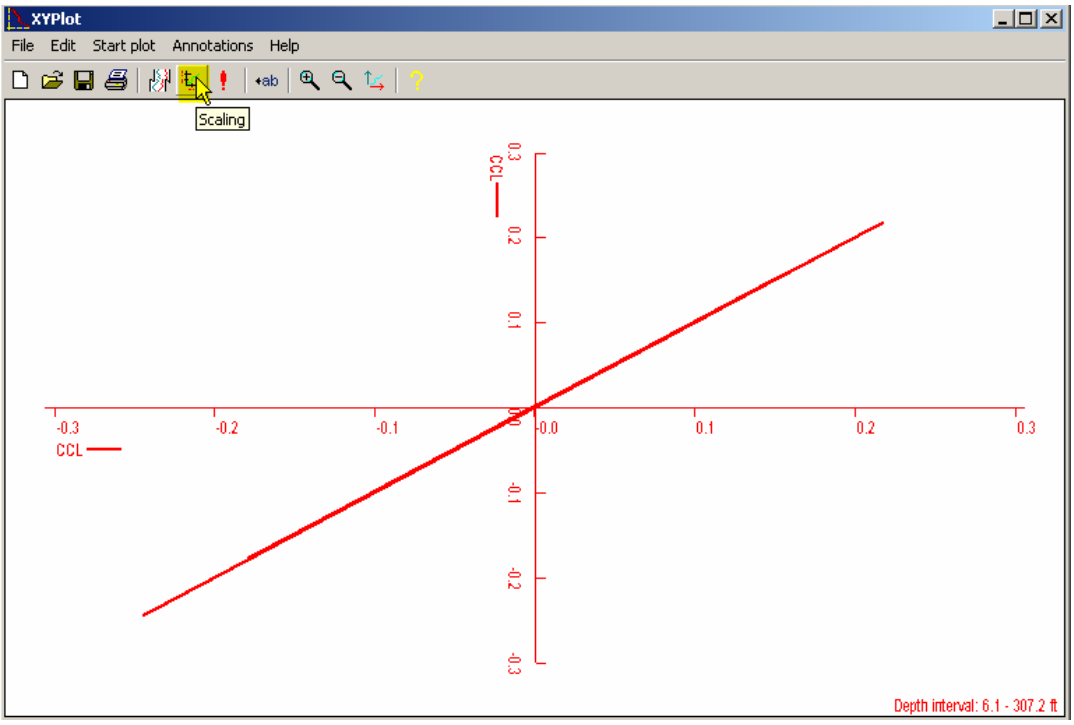


FIG: 13.37 XYPlot

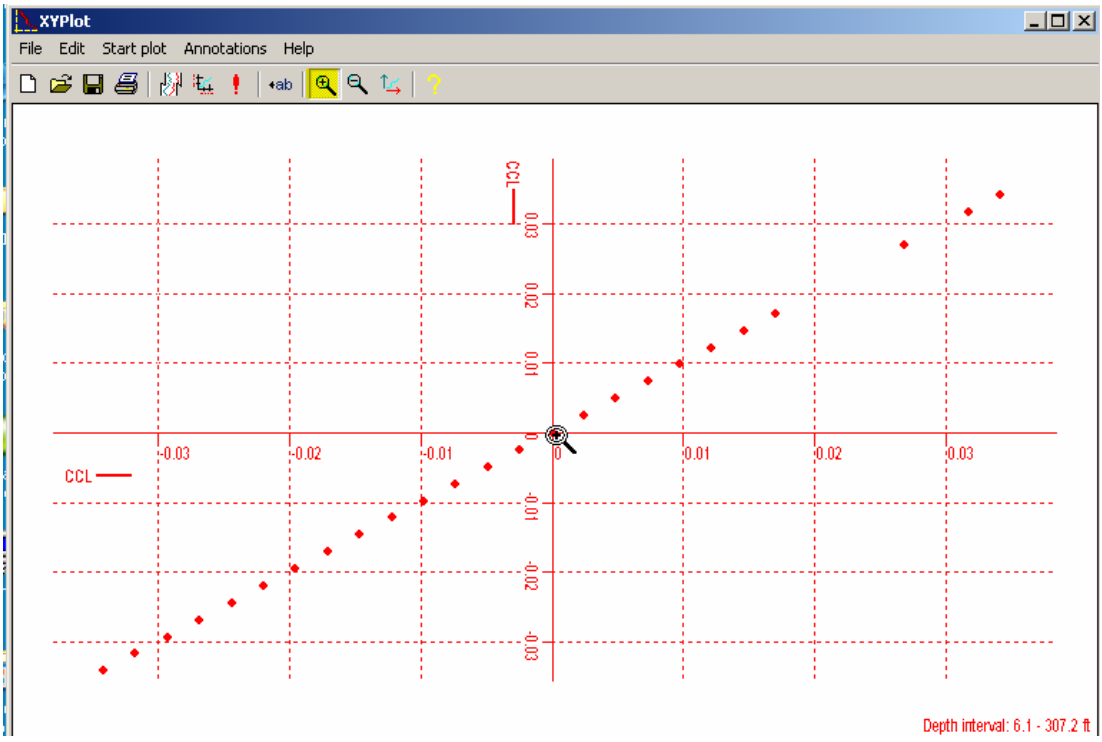


FIG: 13.38 XYPlot new setting zoom

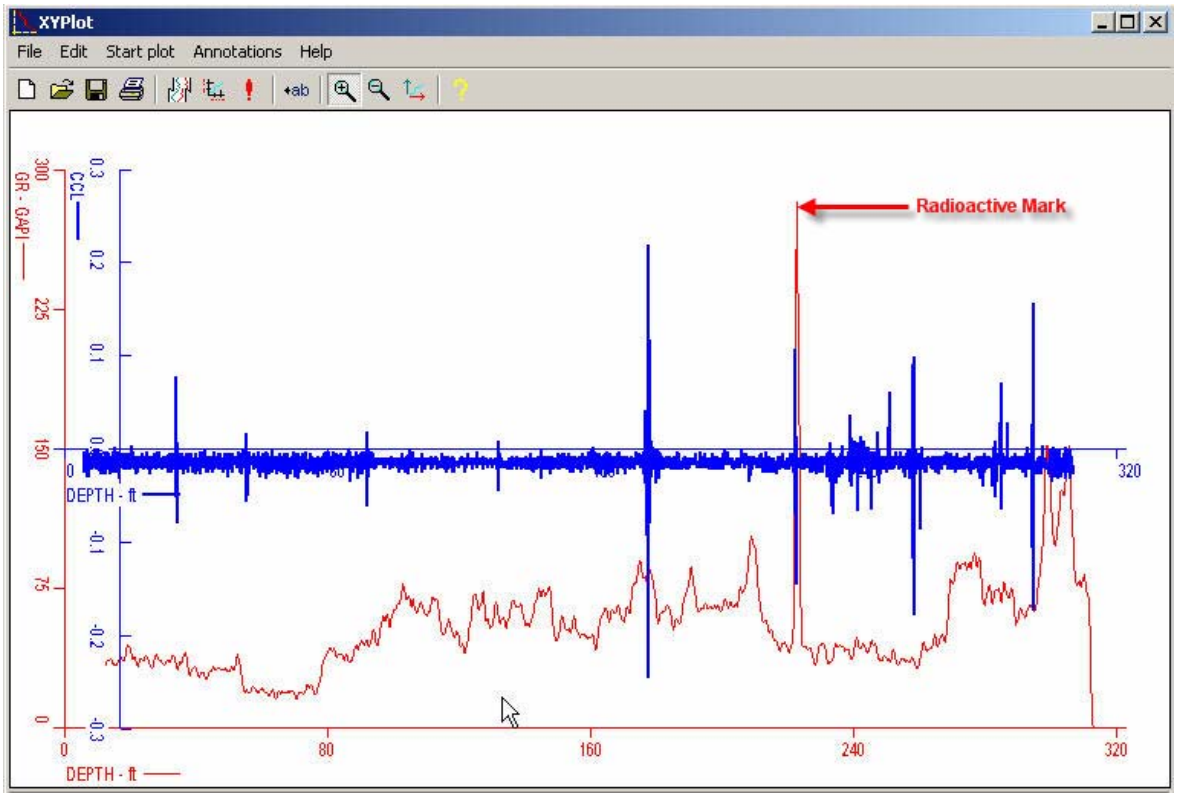


FIG: 13.39 XYPlot Two curves in the same chart

VIDEO: 13.3 XY PLOT

13.2.3 Tracer Interpretation

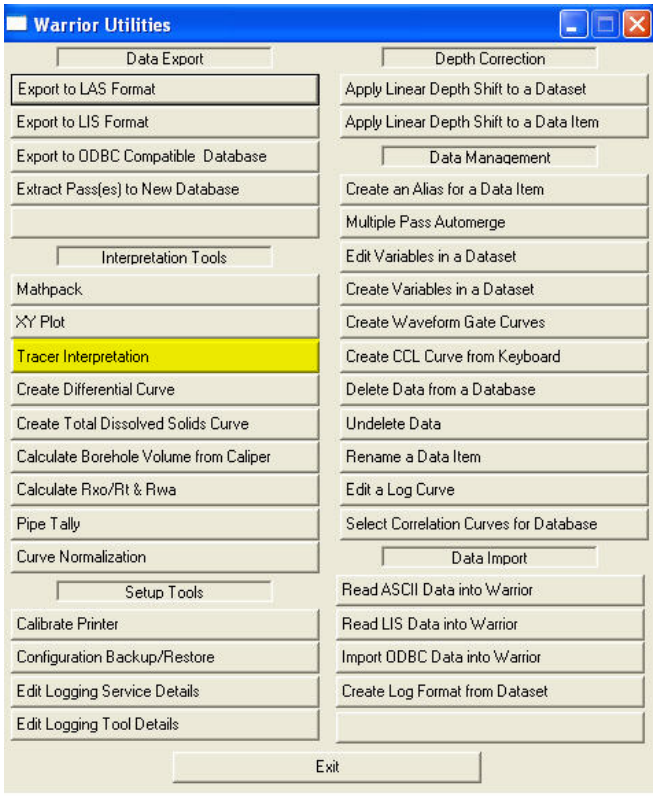


FIG: 13.40 Tracer Interpretation

13.2.4 Create Differential Curve

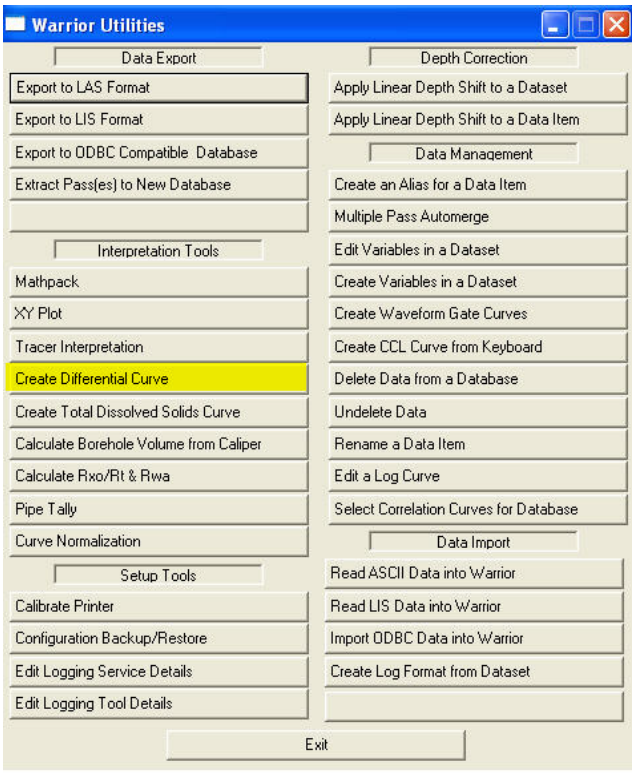


FIG: 13.41 Create Differential Curve

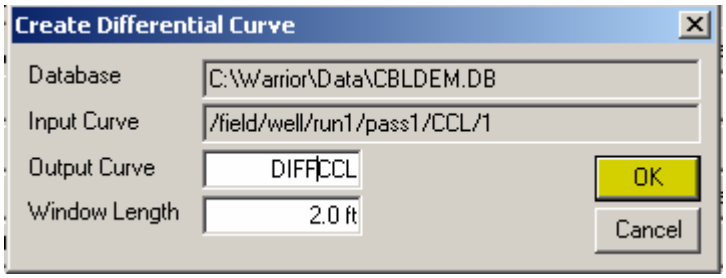


FIG: 13.42 Create Differential curves. (DIFFCCL)

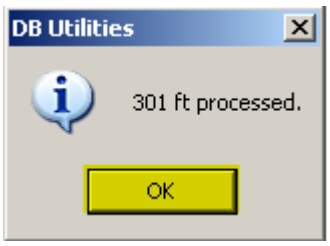


FIG: 13.43 Processing

13.2.5 Create Total Dissolved Solids Curve

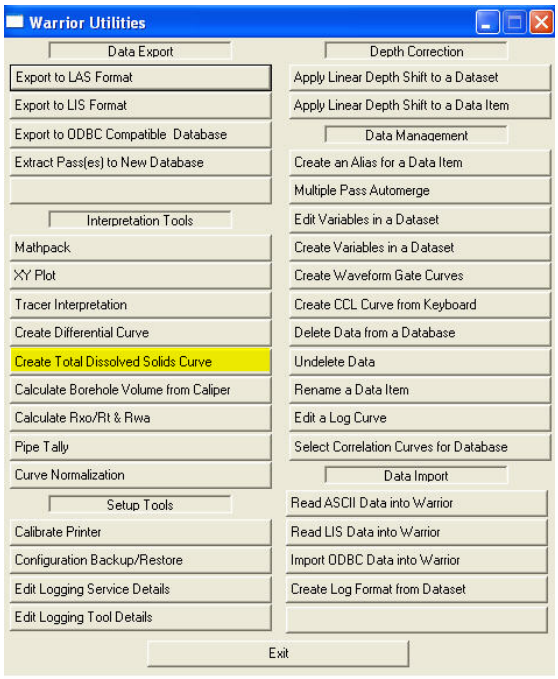


FIG: 13.44 Create Total Dissolved Solids Curve

13.2.6 Calculate Borehole Volume from Caliper

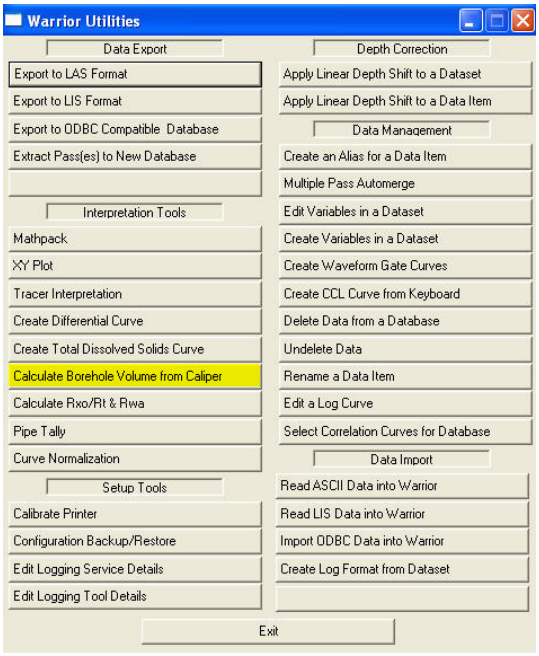


FIG: 13.45 Calculate Borehole Volume from Caliper

13.2.7 Calculate Rxo/Rt and Rwa Curves

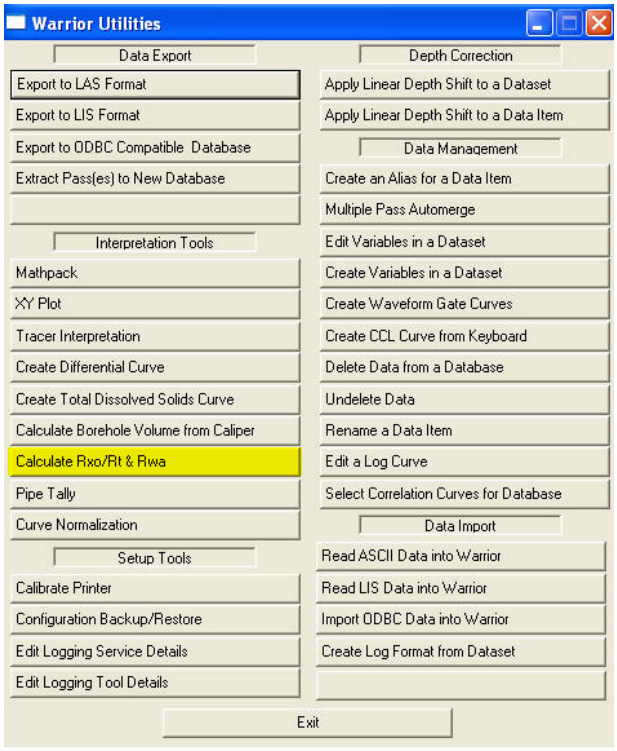


FIG: 13.46 Create Total Dissolved Solids Curve

Click on the Calculate Rxo / Rt button. This produces as file selection box, where the required database may be selected. Double click or Open the database file containing the input data for the calculation.
The program presents a list of the log curves present in the database and requests selection of the Rt curve. Select the desired curve.

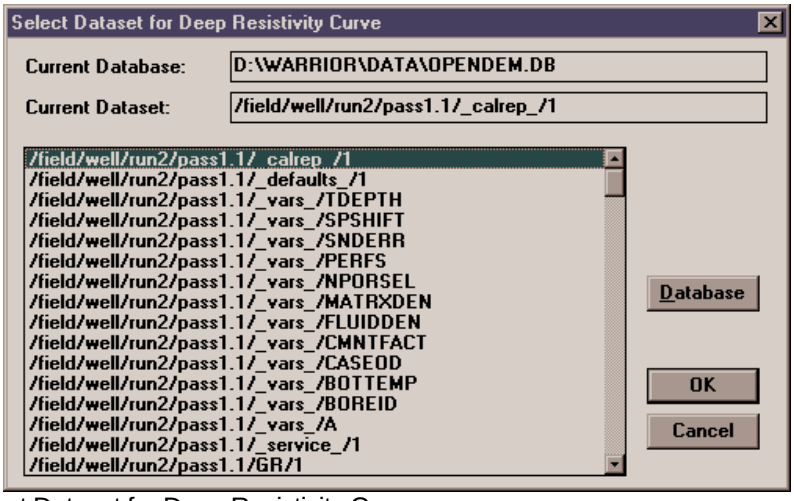


FIG: 13.47 Select Dataset for Deep Resistivity Curve

The system then requests the selection of the shallow resistivity curve.

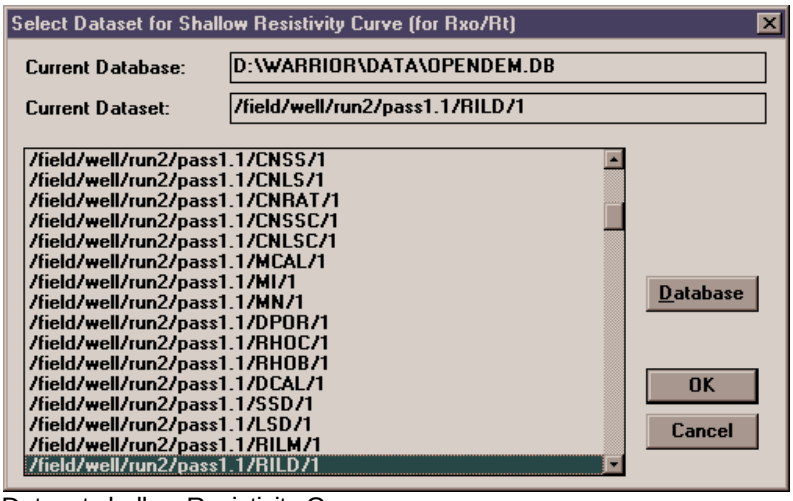


FIG: 13.48 Select Dataset shallow Resistivity Curve

The system then requests the porosity curve for the calculation of Rwa.

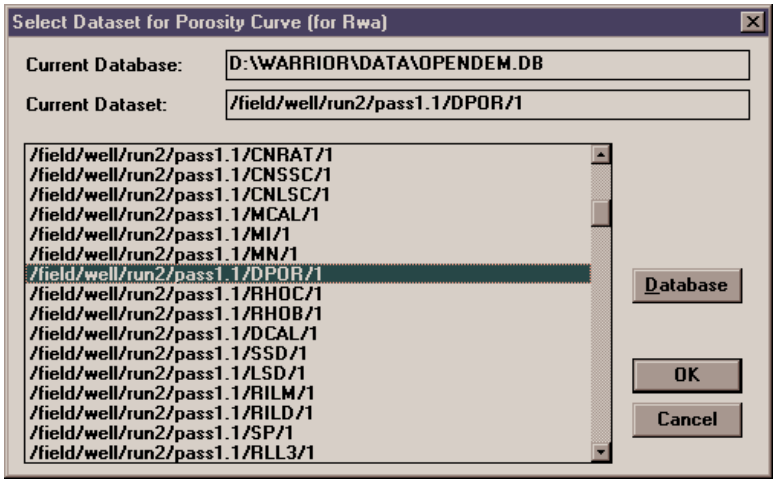


FIG: 13.49 Select Dataset for Porosity

Note that the a and m variables must be present in the dataset for Rwa to be calculated. To set the values of a and m use Edit Variables in a Dataset. Note that the a is A and m is CMNTFC. After selecting the porosity curve the system requests the name of the dataset for the output.

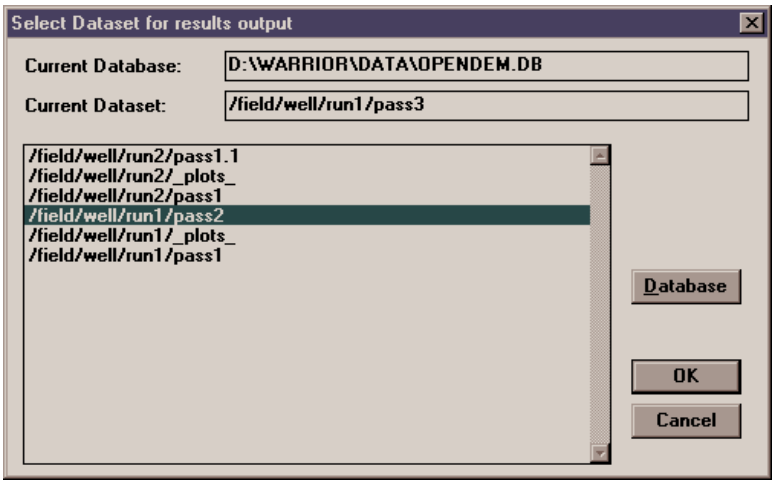


FIG: 13.50 Select Dataset Output

Select the required dataset and the system computes the Rxo / Rt and Rwa curves and displays a message indicating completion and log interval processed.

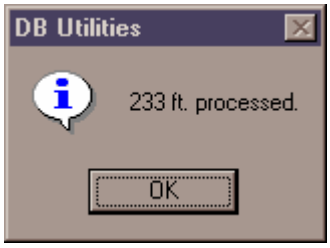


FIG: 13.51 Processing

Note that in order for the Rxo / Rt and Rwa curves to appear on the log, the respective curves must be added to the log format. The mnemonic for the Rxo / Rt and Rwa curves are RXORT and RWA respectively.

13.2.8 Pipe Tally

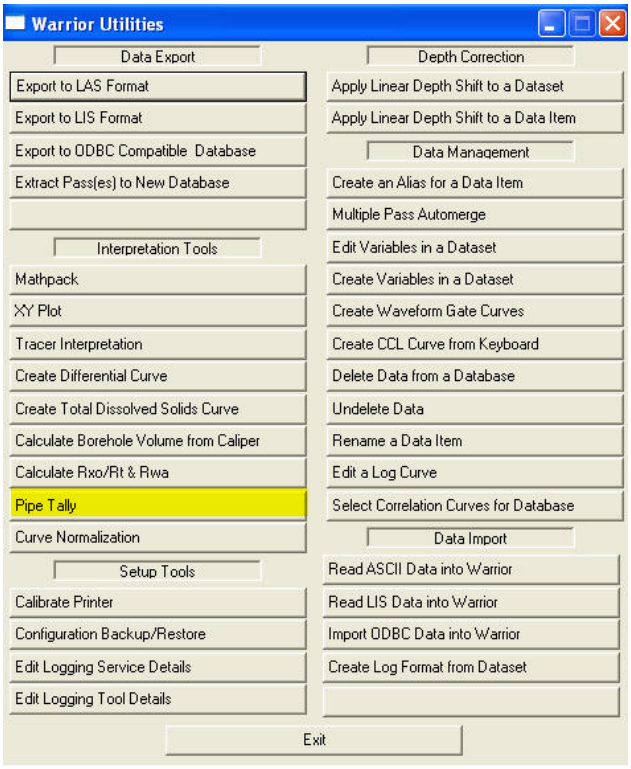


FIG: 13.52 Pipe Tally

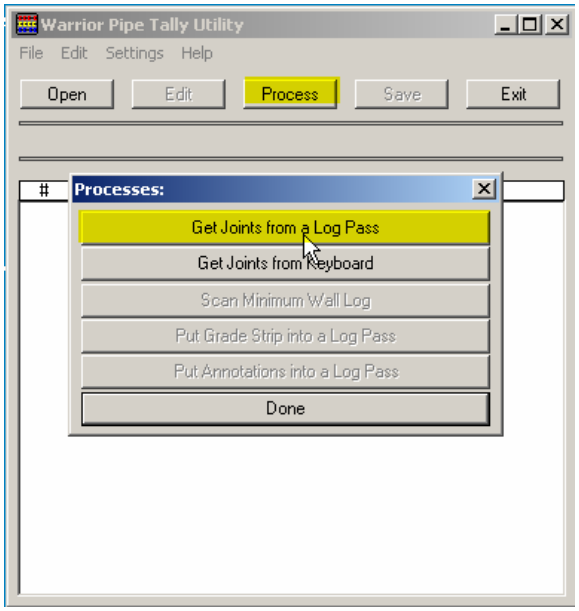


FIG: 13.53 Get Joints from a Log Pass

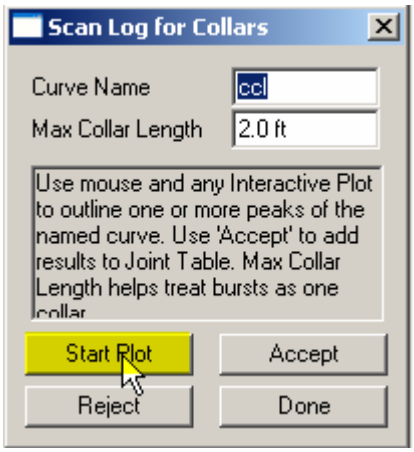


FIG: 13.54 Scan log for Collars

FIG: 13.55 Screen Plot

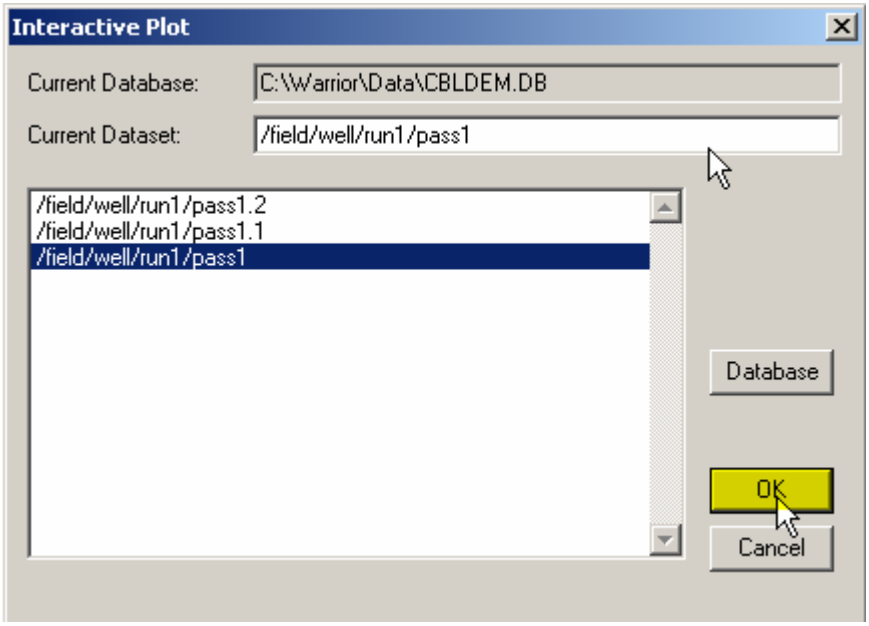


FIG: 13.56 Scan Pass

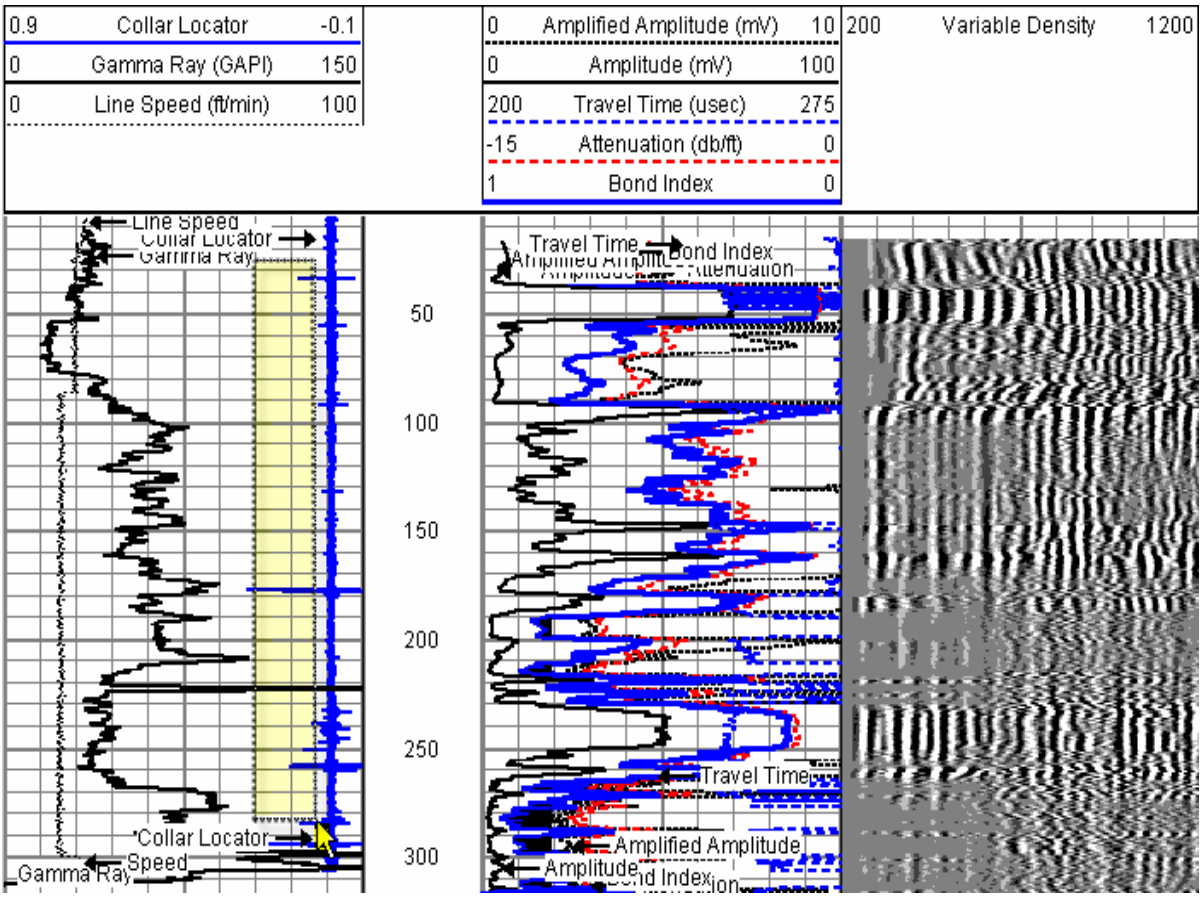


FIG: 13.57 Plot Pass and select area

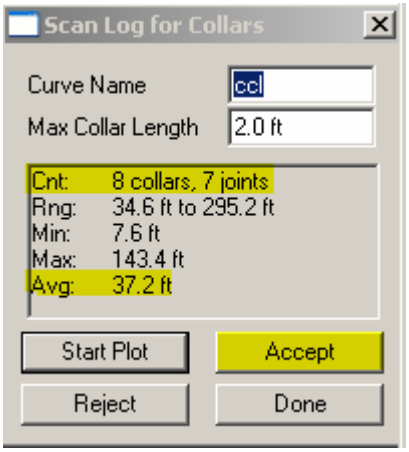


FIG: 13.58 Accept

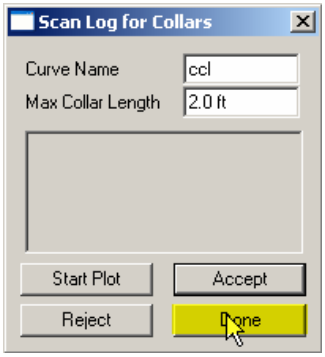


FIG: 13.59 Done

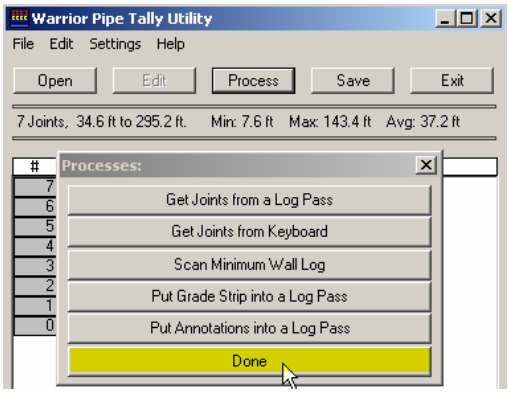


FIG: 13.60 Done

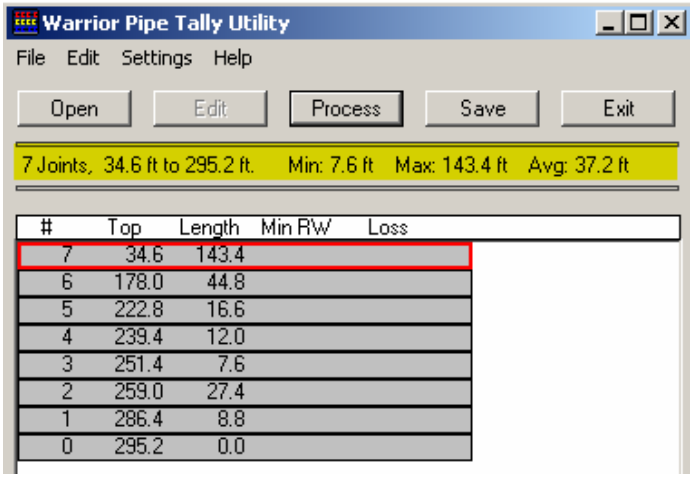


FIG: 13.61 Results

VIDEO: 13.4 Pipe Tally

13.2.9 Curve Normalization

This program will cross plot two curves over a chosen interval. Then it calculates the gain and offset required to apply to the second curve (Curve to be normalized) to make it overlay the first (Reference curve).

Select the reference curve, then the curve to be normalized. Interactive plot should start with the reference log pass. You should be able to plot the curve to be normalized on that same pass - look in the progress window to see the name (alias) that was created for the normalized curve. From interactive plot you can drag a rectangle over the interval to choose the depth range for normalization. Once that is done, and then selects MakeXY. If you are satisfied with the data points in the XY plot, then select Normalize. Interactive plot will start again, but this time with the pass from the normalized curve. If you look in the progress window, another curve will have been created in the Normalized pass. That curve will be what the curve looked like prior to the normalization. The name should be the same as the normalized curve except preceded by a **'.'**, and the normalized curve will have the original name.

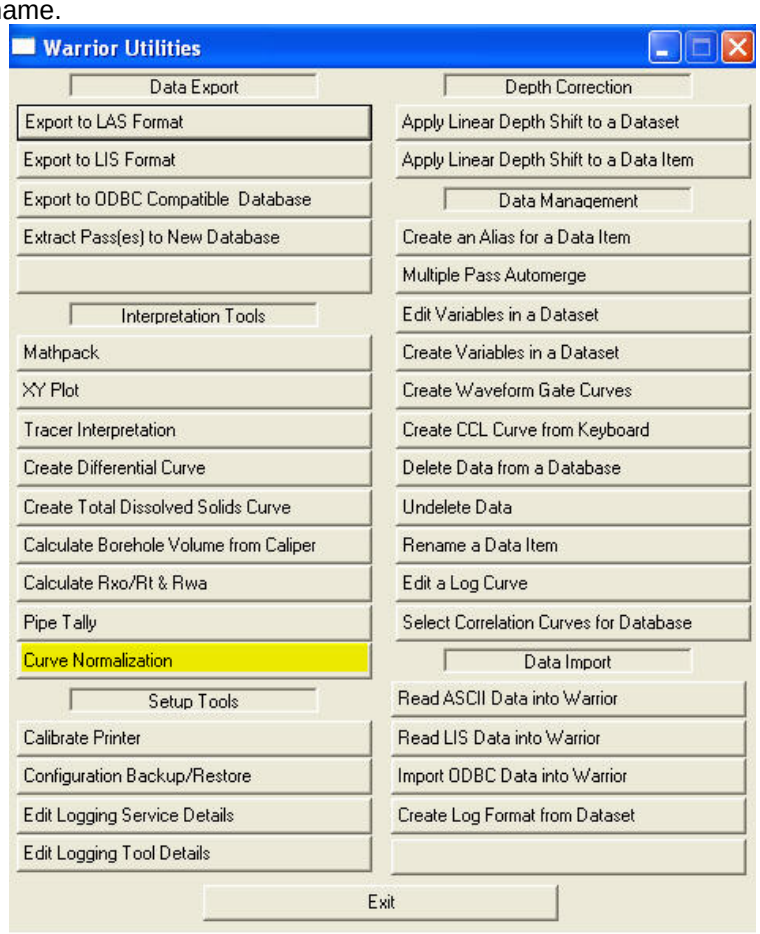


FIG: 13.62 Curve Normalization

13.3 Data Import

13.3.1 Read ASCII Data into the Warrior (LAS)

In the Warrior System group, choose the Utilities icon. (Double-click the icon, or use the arrow key to move the selection cursor to the icon and hit Enter.) The window shown below appears.

The ASCII Importer reads data from existing ASCII file(s) and writes the data to one or more Warrior well log database files.

Start the ASCII importer from the program group or Interactive Plot. The dialog and control box is presented as shown below.

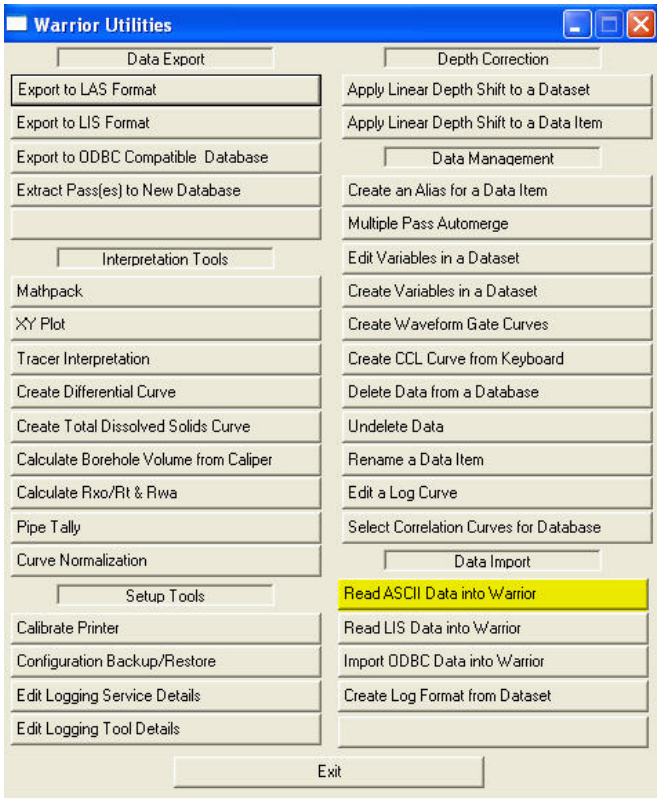


FIG: 13.63 Read ASCII Data into Warrior

The input files are selected by clicking the Add Files button. This produces a file selection box as shown below.

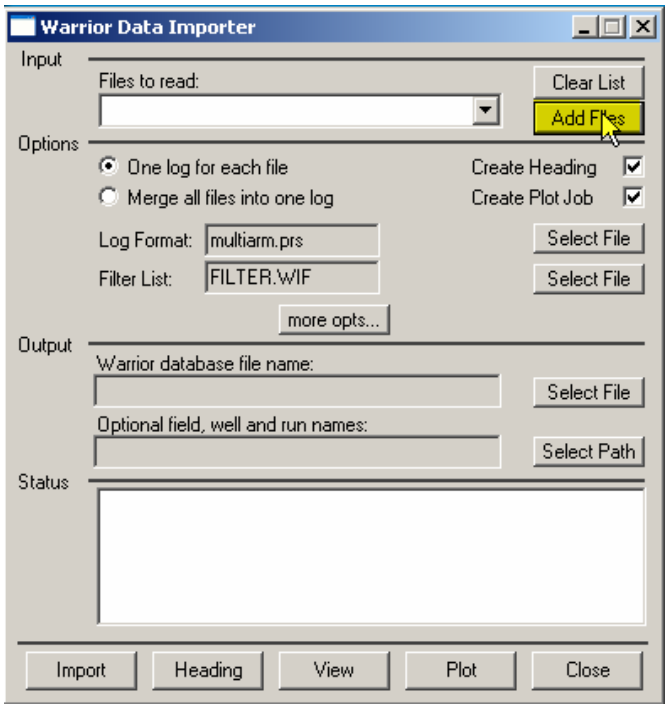


FIG: 13.64 Input File to Read

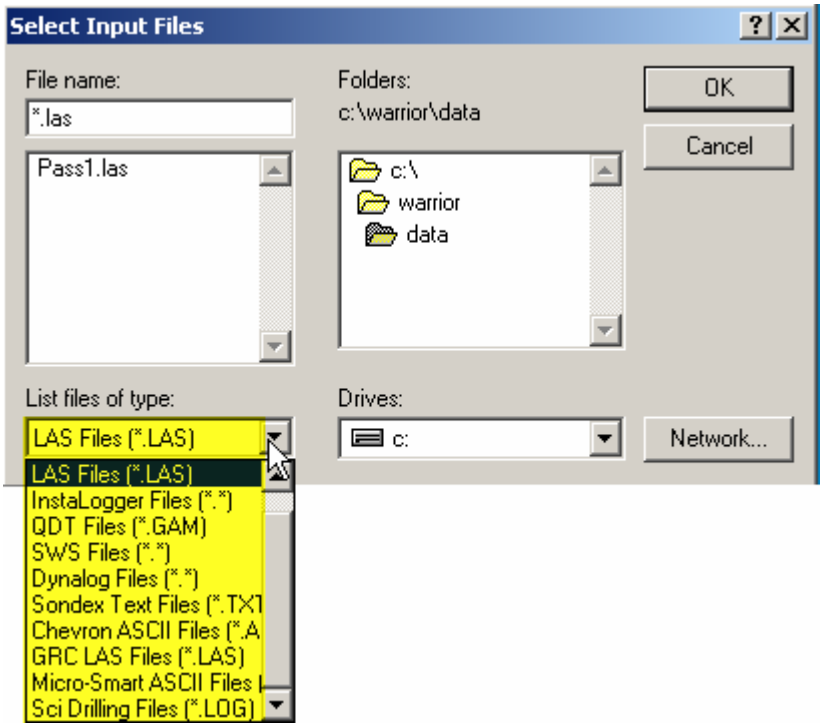


FIG: 13.65 Select the ASCII File Type

The importer will automatically import several common ASCII file types. Clicking on the Files of type selection displays the various ASCII formats handled. Select the type to be imported.
If the ASCII file format to be imported is not displayed here contact SDS.

Select the required ASCII files in the normal way and click Open.
The selected files may be viewed by clicking the button in the Files to read: field. The selected files may be cleared by clicking the Clear List button.
In Options Clicking the One log for each file radio button generates a warrior log pass for each ASCII file selected.
Clicking the Merge all files into one log button merges all the selected ASCII files into one log pass. If the ASCII files contain curves of the same name, the importer will automatically add a numerical subscript to the duplicate curves according to the order they appear in the Files to read: list.
The default presentation file for the new log pass is entered in the Log Format field by clicking the corresponding Select File button.
The filter list file has the default extension .wif. It may be selected by clicking the corresponding Select File button.
Checking the Create Heading selection causes the importer to create a log heading file based on any available information from the ASCII input file(s). If no information is available it will create a blank heading in the new database.
Checking the Create Plot Job selection causes the importer to create a default plot job based on the log heading (if any) and the imported log passes.

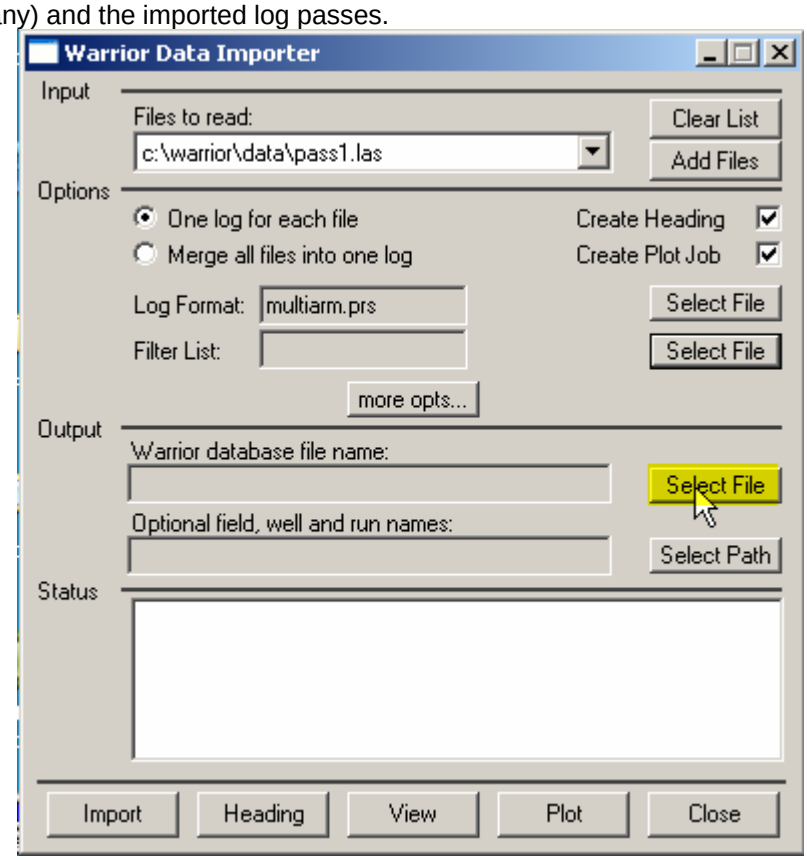


FIG: 13.66 Select File

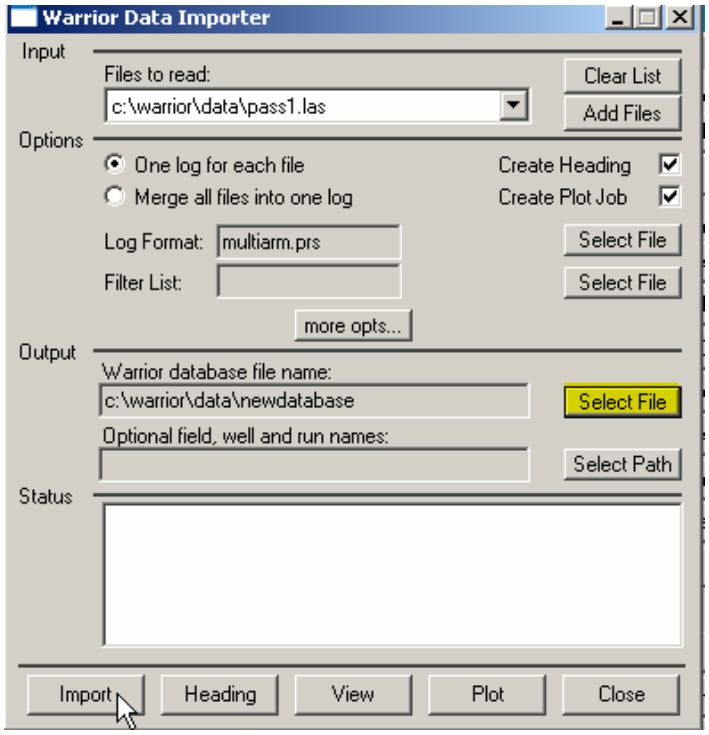


FIG: 13.67 Setup Warrior data Importer

If required the curves may be filtered during the import process. An ASCII text file must be created in the \warrior\bin directory and consist of a list of filter definitions similar to those used in the tools.ini file to define default filters

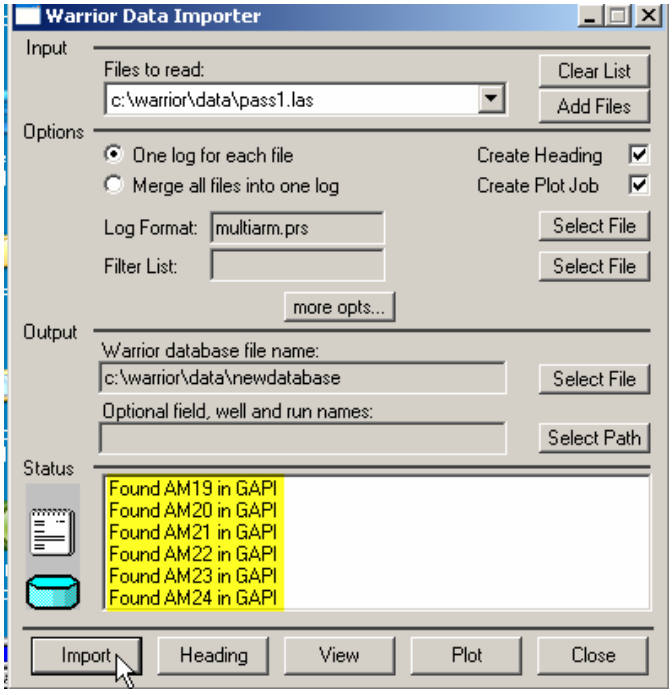


FIG: 13.68 Start to select the curves

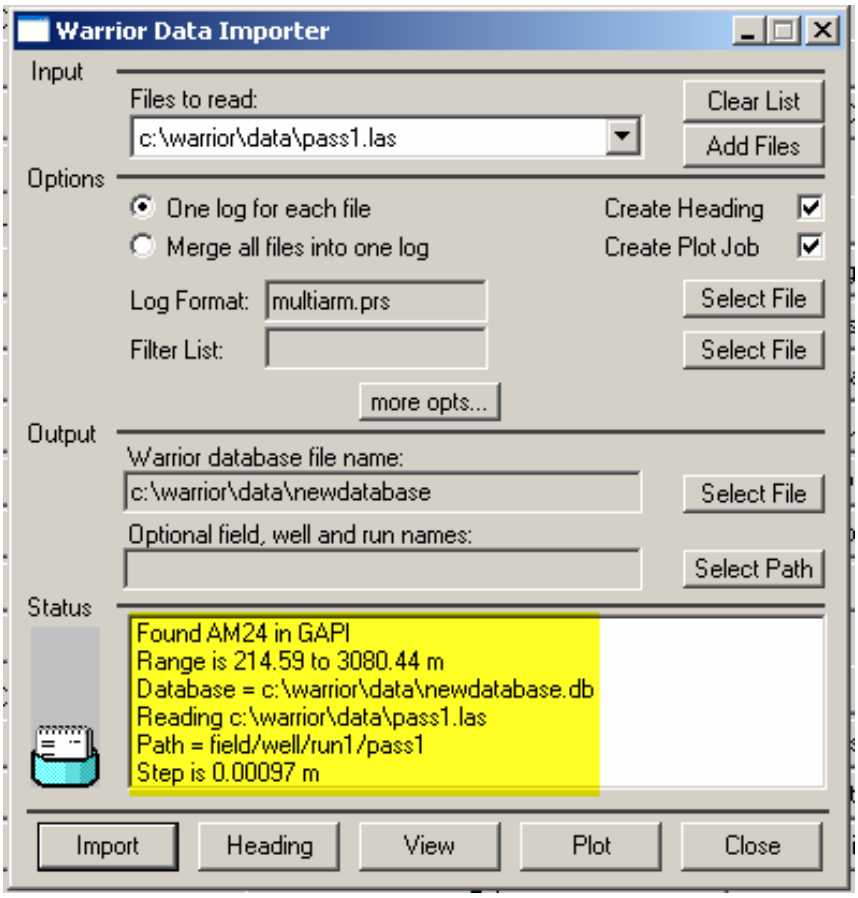


FIG: 13.69 Reading the ASCII and convert to DB

The status window displays a log of the importing operations.
Having made the various selections and chosen the required options the importer may be run by clicking the Import button. The importer will read the selected ASCII files and display the status.
Clicking the Heading button starts the Heading Editor program and displays the heading generated by the import process. If Create Heading was not selected a blank heading will be presented.
Clicking the View button starts the Interactive Plot program for screen display of the results of the import process.
Clicking the Plot button starts the Plot Job Editor program with the plot job generated during the import process (if any). If Create Plot Job was not checked a blank plot job is presented.
The Close button closes the Importer program.

VIDEO: 13.5 Read ASCII

13.3.2 Read LIS Data into the Warrior

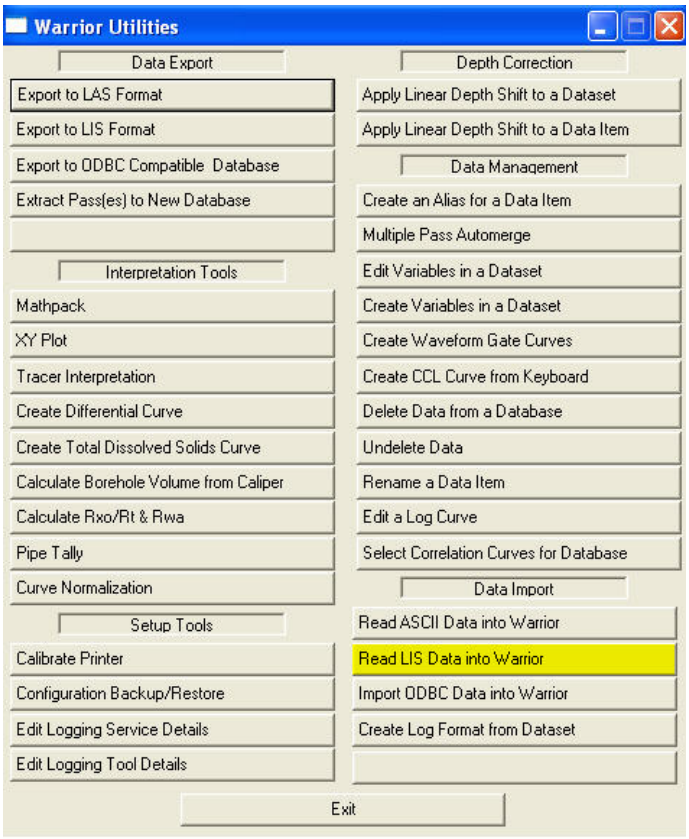


FIG: 13.70 Select Read LIS Data into Warrior

A tape must be copied to a disk file before it can be read in to a Warrior database. Select 'From Tape' and then select the tape drive and the output file name. Once that is completed, select OK to copy the data to a file. Once the data is read to a file, then a scan or conversion can be done.

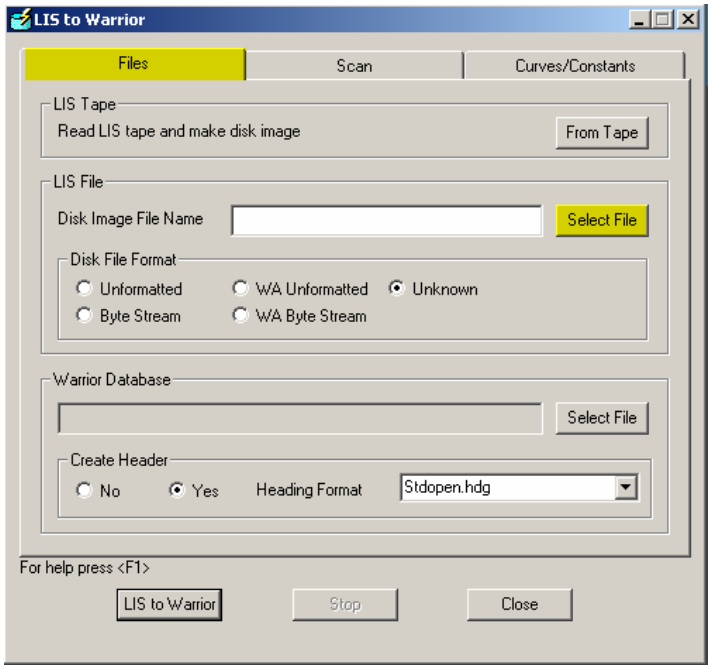


FIG: 13.71 Select LIS file

After the LIS file has been selected, choose one of the LIS file types. If you are not sure what the file type is then select Unknown. This will loop through all of the LIS file types until it can read the file without an error.

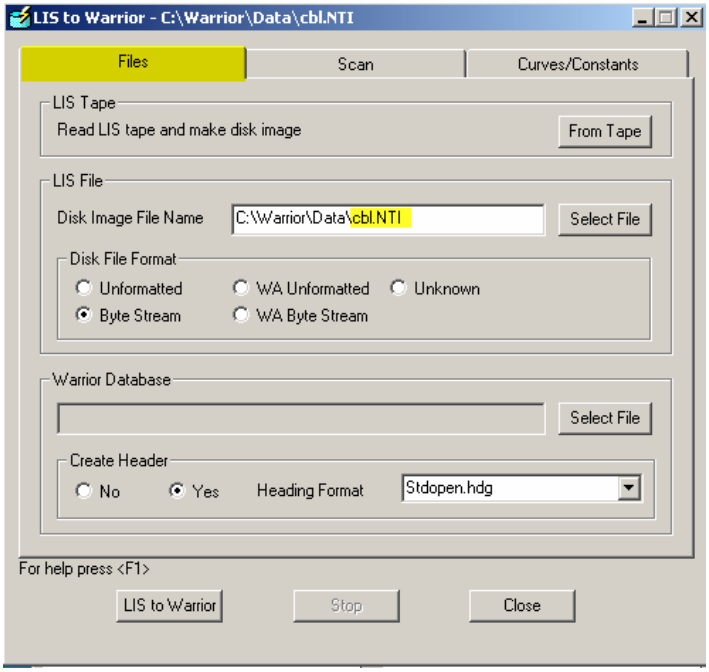


FIG: 13.72 CBL.NIT File

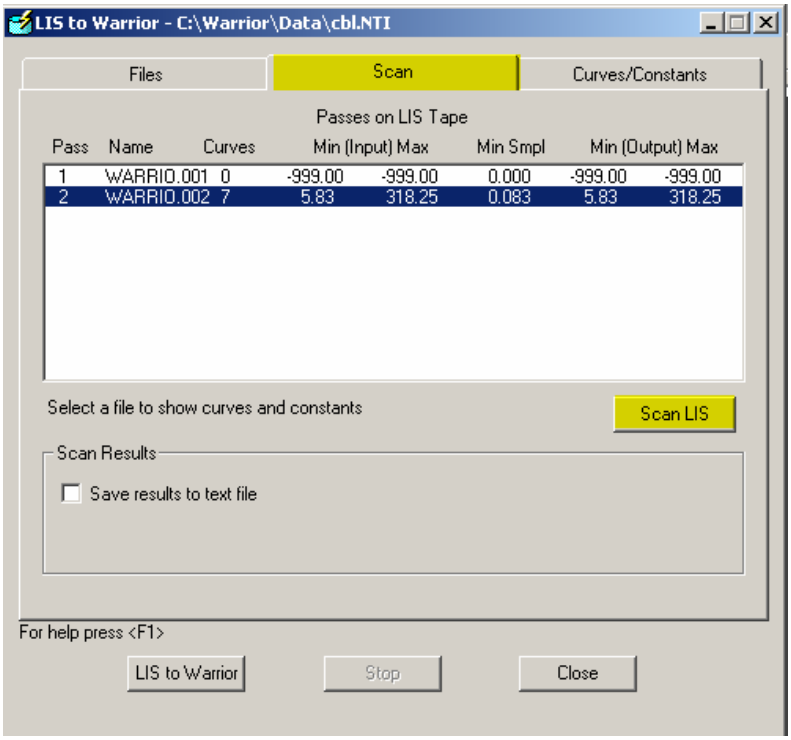


FIG: 13.73 Scan

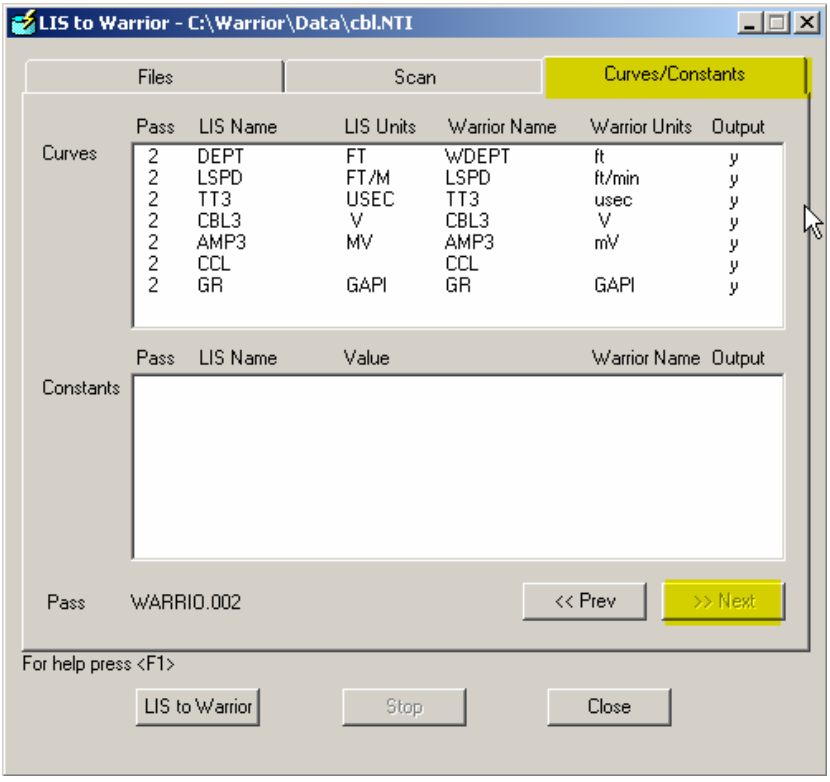


FIG: 13.74 Curves/Constants

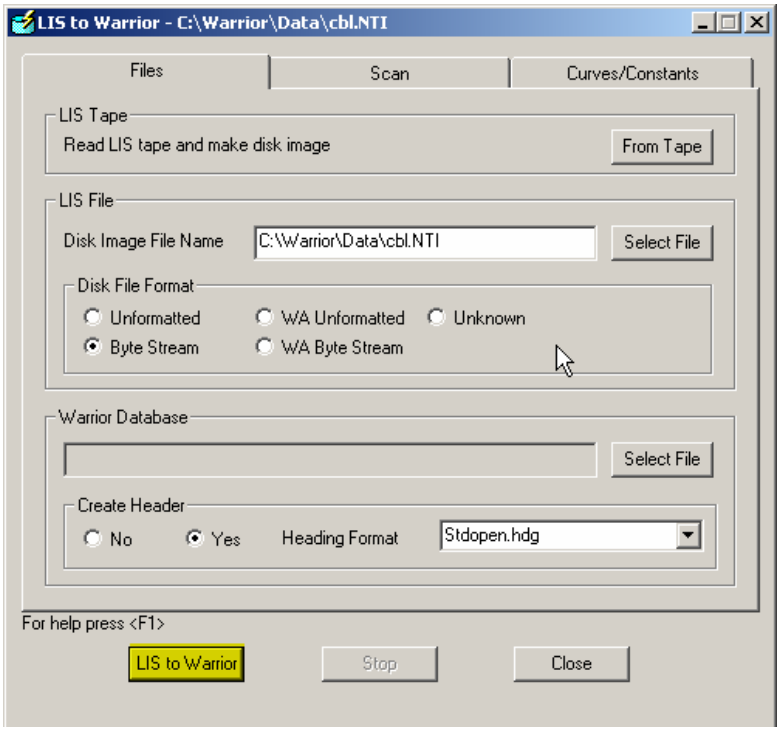


FIG: 13.75 Convert List to Warrior

The destination database file name does not have to exist, but the specific run given for the destination cannot exist. For any LIS passes greater than the first pass, the LIS pass number will be appended to the output Warrior database pass name to create a unique Warrior name for each pass. If a header is requested, then the heading information will be filled out based on the type of heading chosen. The heading that is chosen will affect the list of available heading names shown when editing constants from the Curves/Constants dialog. The heading that is created will go to /[field]/[well]/[run]/_plots_/_headings_/1. Only one heading is allowed per /[field]/[well]/[run]/. Therefore, if a database is created from a LIS file with multiple passes, only the heading information from the first pass will be used to create the heading

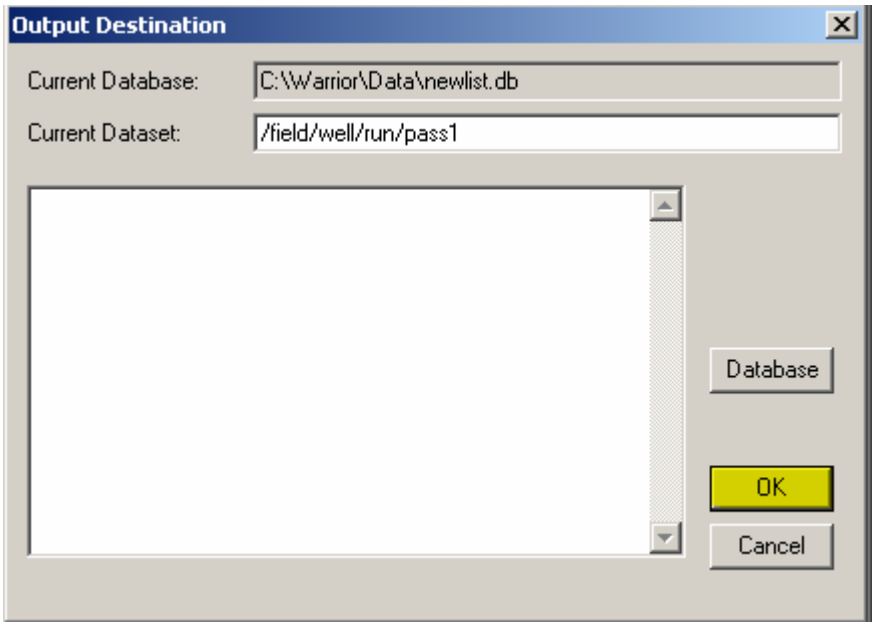


FIG: 13.76 Output

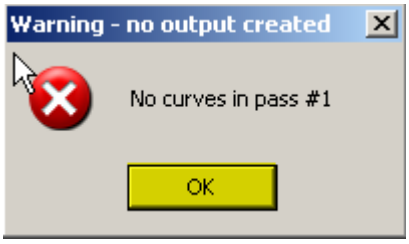


FIG: 13.77 Header not Output Curves

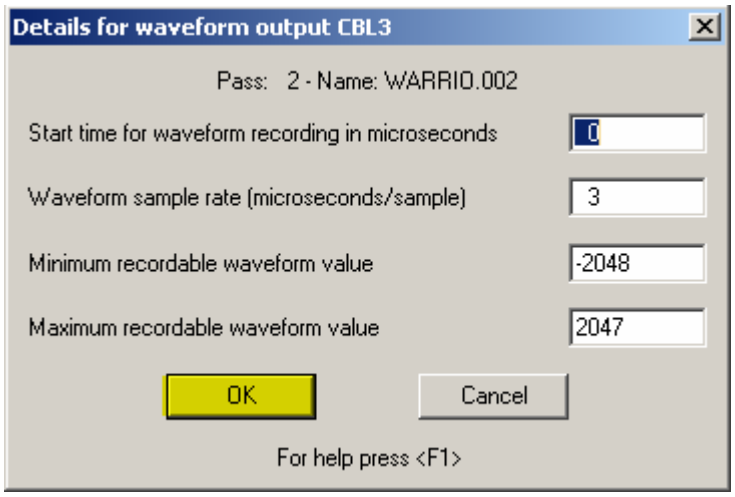


FIG: 13.78 Setup Output Details (see CBL.LET file Section 13.1.2.1)

More Information Required for Waveform Data
The top line of the dialog contains the pass number and name from the LIS tape.
The start time for the waveform is the number of microseconds that elapsed prior to the beginning of recording the waveform.
The waveform sample rate is the total sample interval (in microseconds) divided by the total number of samples taken.
The minimum and maximum recordable waveform values are required for scaling the waveform plot properly. For example, a 13 bit-sampling device may have a range of values from –2048 to +2047.

VIDEO: 13.6 Read LIS

13.3.3 Import ODBC Data into Warrior

This program will import data for Excel, Access, FoxPro and other ODBC compatible databases. The limit for exporting data is 255 data points per sample. A normal curve is one data point but a waveform will be many more points for each sample. You will see a message in the progress window that the column count has exceeded if you exceed that amount.

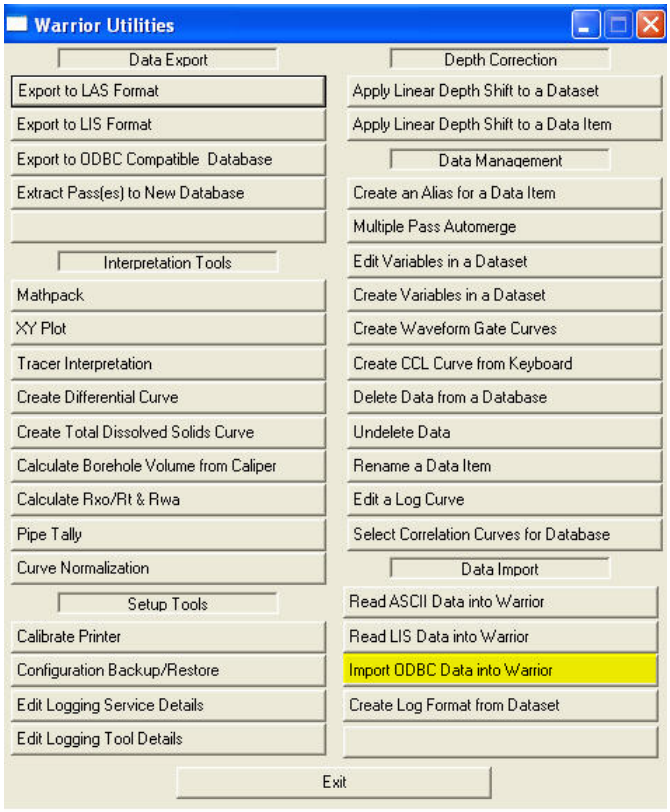


FIG: 13.79 Import ODBC Data Into Warrior

13.3.4 Create Log format from Dataset

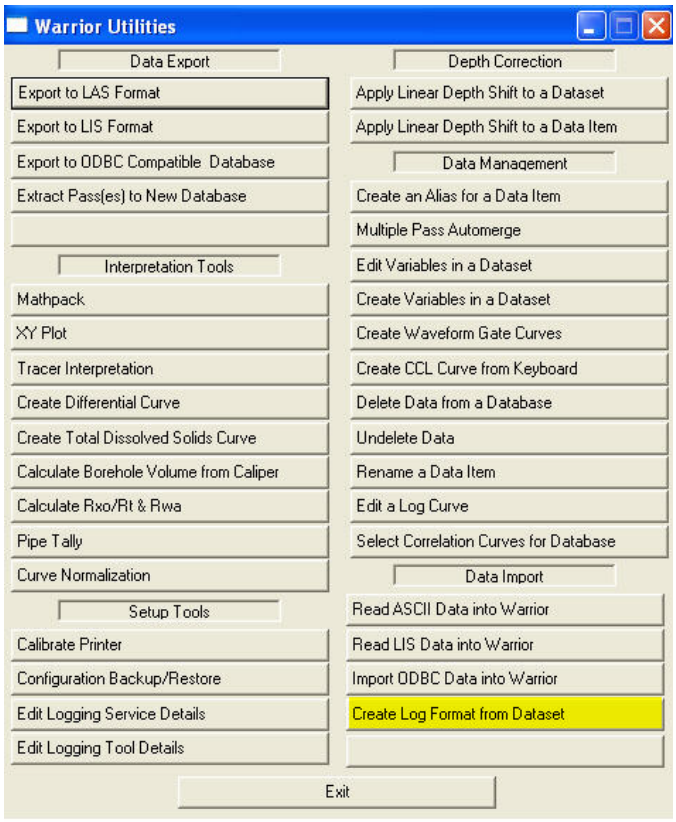


FIG: 13.80 Create Format from Dataset

13.4 Depth Correction

13.4.1 Apply linear Depth Shift to the a Dataset

This feature is intended to provide a rapid tie-in capability by applying a linear depth shift to a Dataset. Once a section of log has been made and is displayed on the screen, select **Depth Shift** from the Action menu.

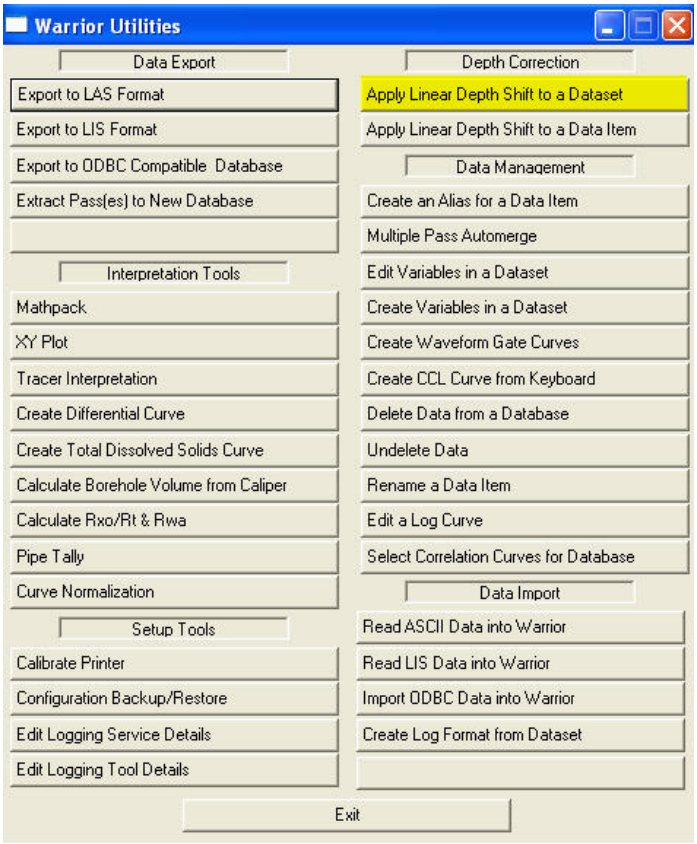


FIG: 13.81 Apply Linear Depth Shift to a Dataset

Clicking on this button brings up the same depth shift dialog box that is available from the Acquisition module. It allows a linear depth shift to be quickly applied to a dataset (typically all the curves in a log pass).

13.4.1.1 Depth Shift a Dataset

In the Warrior System group, choose the Utilities icon. (Double-click the icon, or use the arrow key to move the selection cursor to the icon and hit Enter.). The Utilities menu box will appear.
Click on the Apply Linear Depth Shift to a Dataset button. A dialog box will appear as shown below:

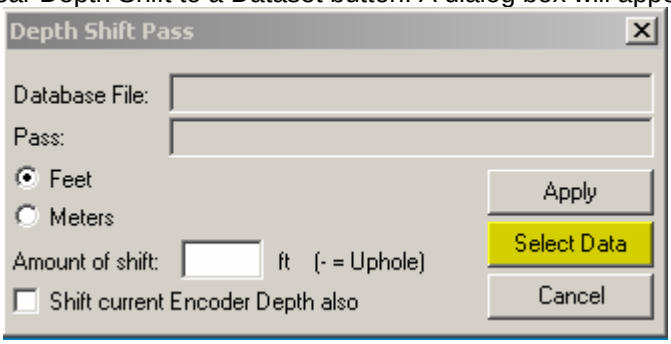


FIG: 13.82 Depth Shift Pass

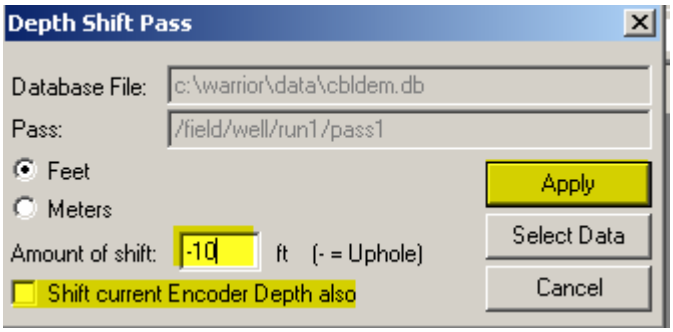


FIG: 13.83 Set Depth Shift

Enter in the Amount of shift box, the shift to be applied (a positive number to make the data deeper, and negative to make the data shallower).
Click on the Apply button and the data is shifted the requisite amount.
Note that the default is for the Shift current Encoder Depth also box to be inactive, i.e. the encoder depth will not be updated unless the box is checked.

13.4.2 Apply linear Depth Shift to the a Data item

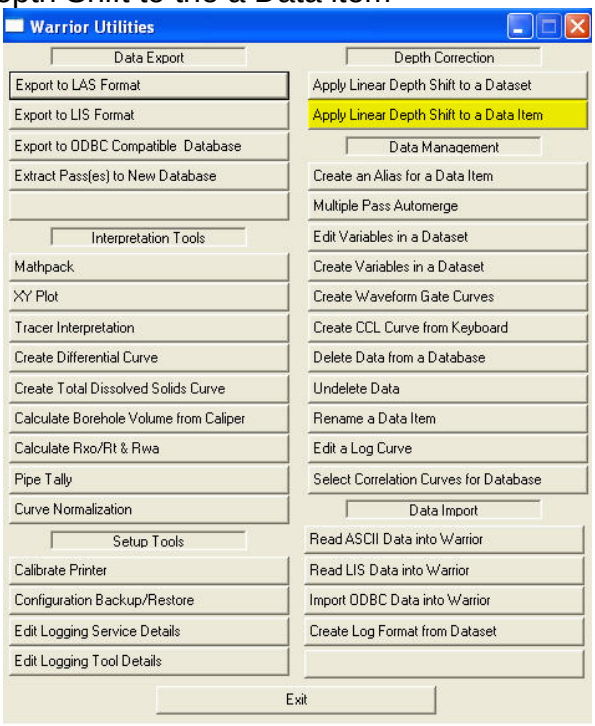


FIG: 13.84 Apply Linear Depth Shift to a Data Item

Clicking on this button brings up a similar depth shift dialog box that is available from the Acquisition module. It allows a linear depth shift to be quickly applied to a data item (typically one curve from a log pass).
In the Warrior System group, choose the Utilities icon. (Double-click the icon, or use the arrow key to move the selection cursor to the icon and hit Enter.). The Utilities menu box will appear.
Click on the Apply Linear Depth Shift to a Data Item button. A dialog box will appear as shown below:

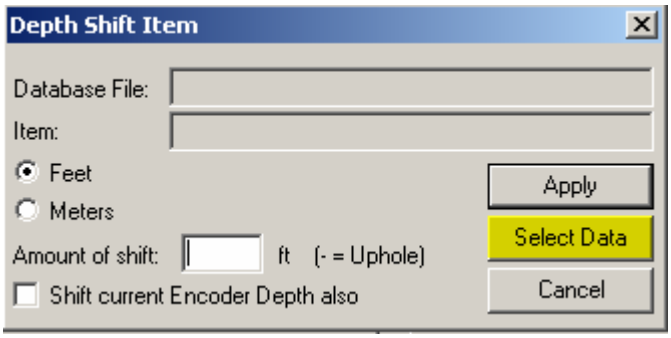


FIG: 13.85 Select Data

Click the Select Data button to select the database file and then the data item (curve) to be depth shifted.

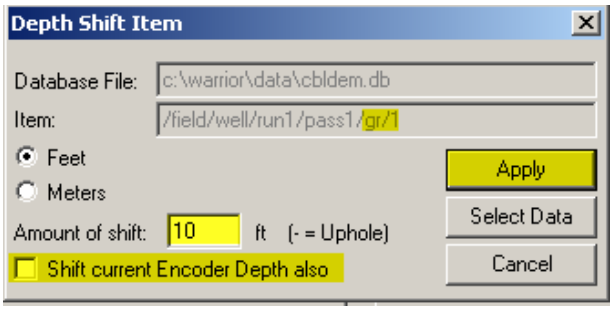


FIG: 13.86 Select

Enter in the Amount of shift box, the shift to be applied (a positive number to make the data deeper, and negative to make the data shallower). Click on the Apply button and the data item is shifted the requisite amount.
Note that the default is for the Shift current Encoder Depth also box to be inactive, i.e. the encoder depth will not be updated unless the box is checked.

13.5 Data Management

13.5.1 Create an Alias for a Data Item

Clicking on this button brings up a dialog box, which allows a data item, typically a curve from a log pass, to appear as though it were present in another (different) log pass. This allows curves and other data items to be effectively merged to other datasets, without using the Merge program or creating new merged log passes. Essentially a form of link is defined in the database(s) that allows application programs (such as Interactive Plot) to access data items from datasets other than the dataset currently selected.
In the Warrior System group, choose the Utilities icon.

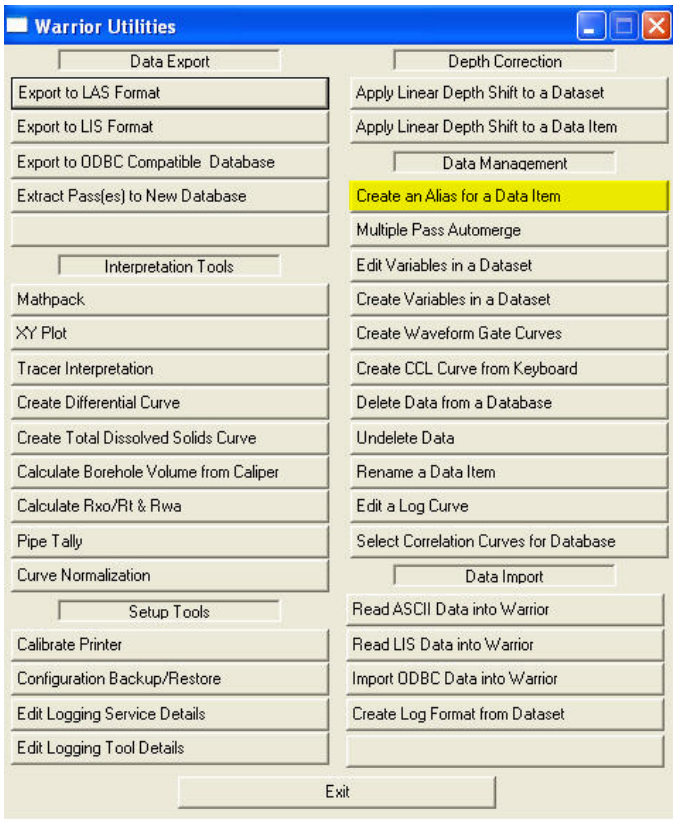


FIG: 13.87 Select Create an Alias for a Data Item

Click on the Create an Alias for a Data Item button. A dialog box will appear as shown below:

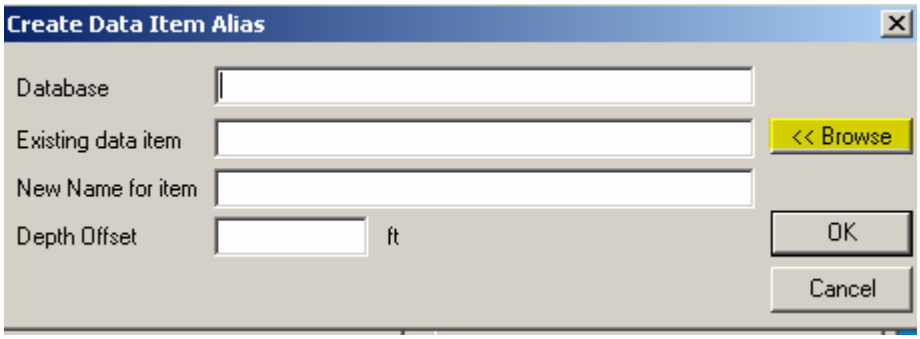


FIG: 13.88 Browse DataBase

Click the Browse button and select the database file, then the dataset (log pass) and finally the data item to aliased. In the case shown below the curve GR has been selected from pass12 of the cbldemo.db database.

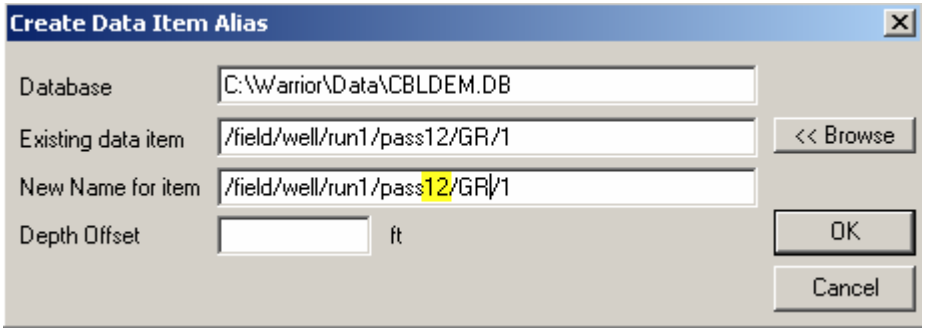


FIG: 13.89 Create data Item Alias

This is the database item to be aliased to another pass.
In the New Name for item field replace any or the entire data item path. For example if we want this GR curve to appear in pass1, we type over pass12 with pass1, as shown below:

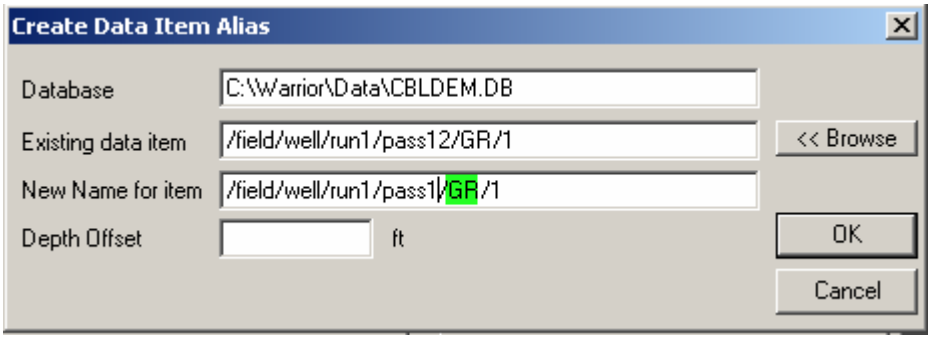


FIG: 13.90 Create Pass1

The OK button is clicked and the GR curve from pass12 will now appear in pass1. If a curve with the same name already exists in pass1 then the program will give a message indicating that this is the case and the alias will not be performed. The easiest thing to do in this case is to rename the GR curve to something else (which does not already exist in that pass) e.g. GR2.

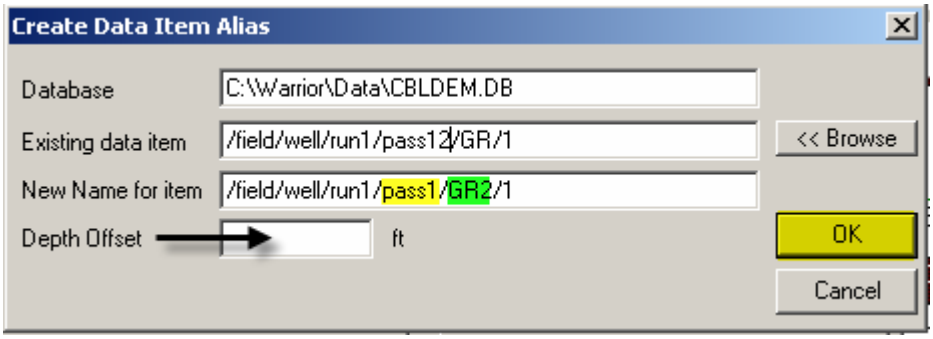


FIG: 13.91 Create GR2 Curve

Clicking the OK button will now alias the pass12 GR curve to pass1 as GR2. Note that if you now wish to plot this curve it will be necessary to include a curve called GR2 in the presentation file with which the pass will be plotted.
Note that a linear depth offset may be applied to the data item as it aliased, so if the curve is not depth aligned with the other data in the destination path, it may be corrected at this point.
Note also that no new log passes are created in this process and the size of the database(s) remains the same. This is very important when wishing to present waveform data from several passes simultaneously, as large amounts of data would otherwise be created.

13.5.2 Multiple pass Auto merge

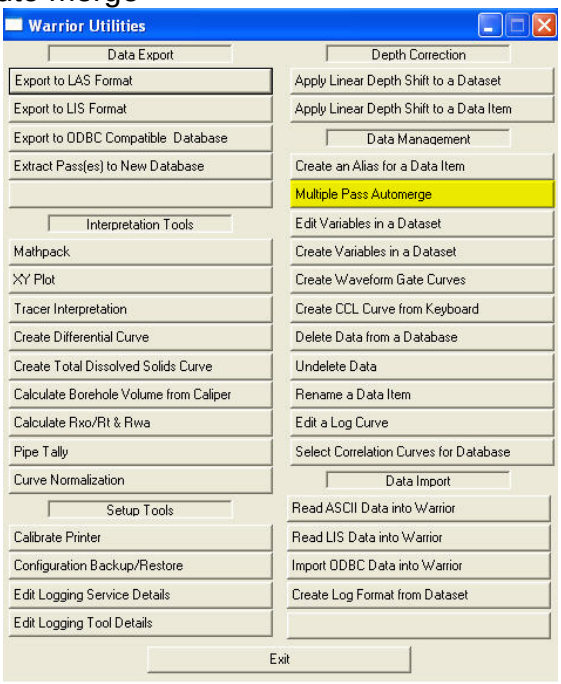


FIG: 13.92 Multiple Pass AutoMerge

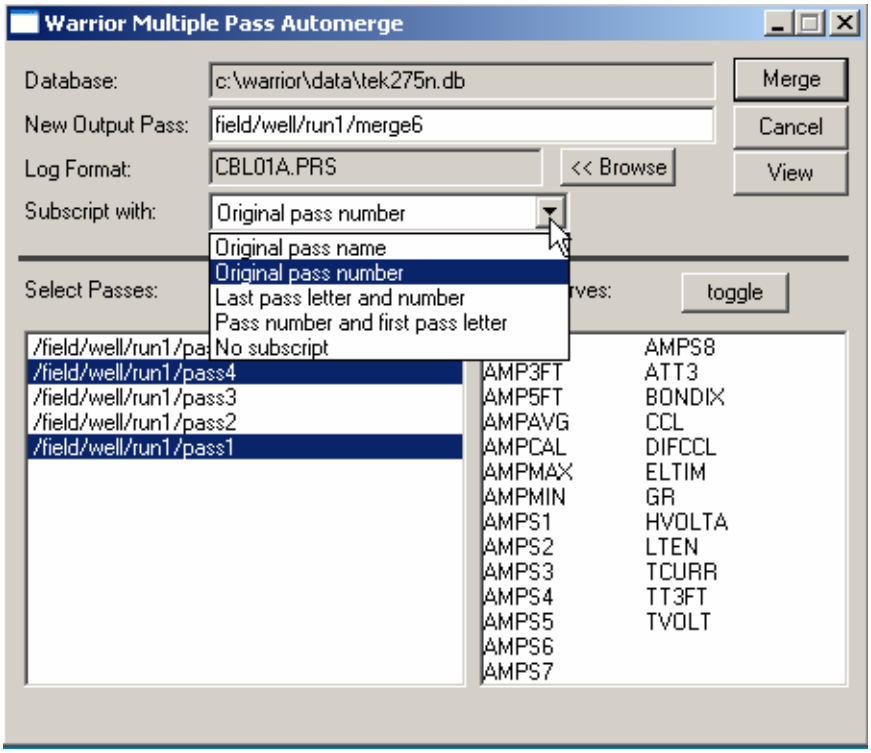


FIG: 13.93 Multiple Pass Automerge

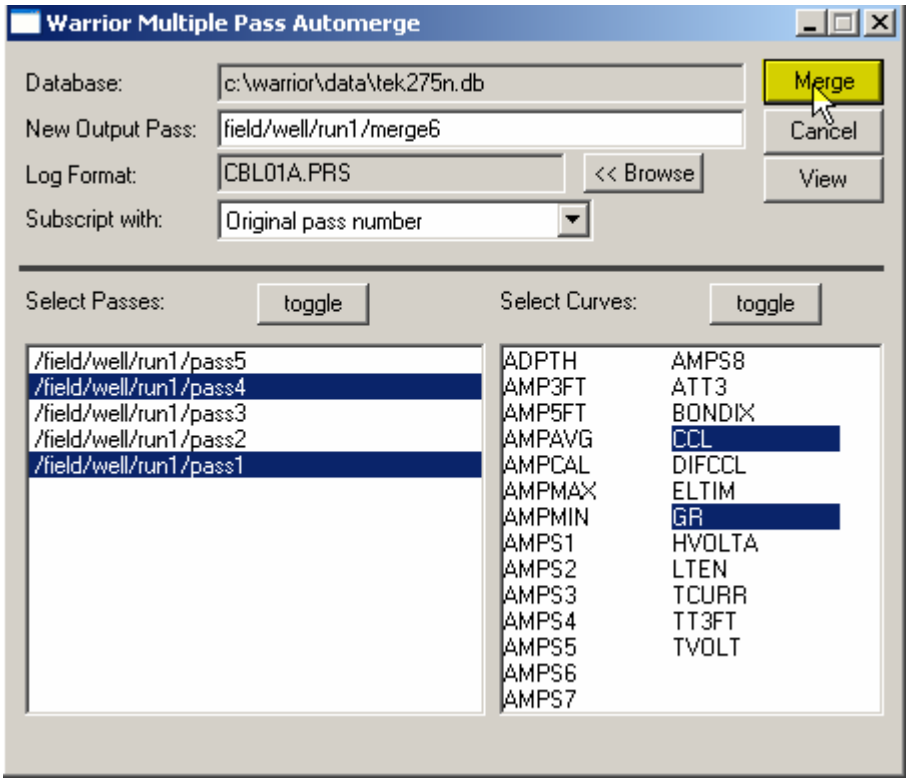


FIG: 13.94 Set Passes and Curves

FIG: 13.95 Four new aliases curves

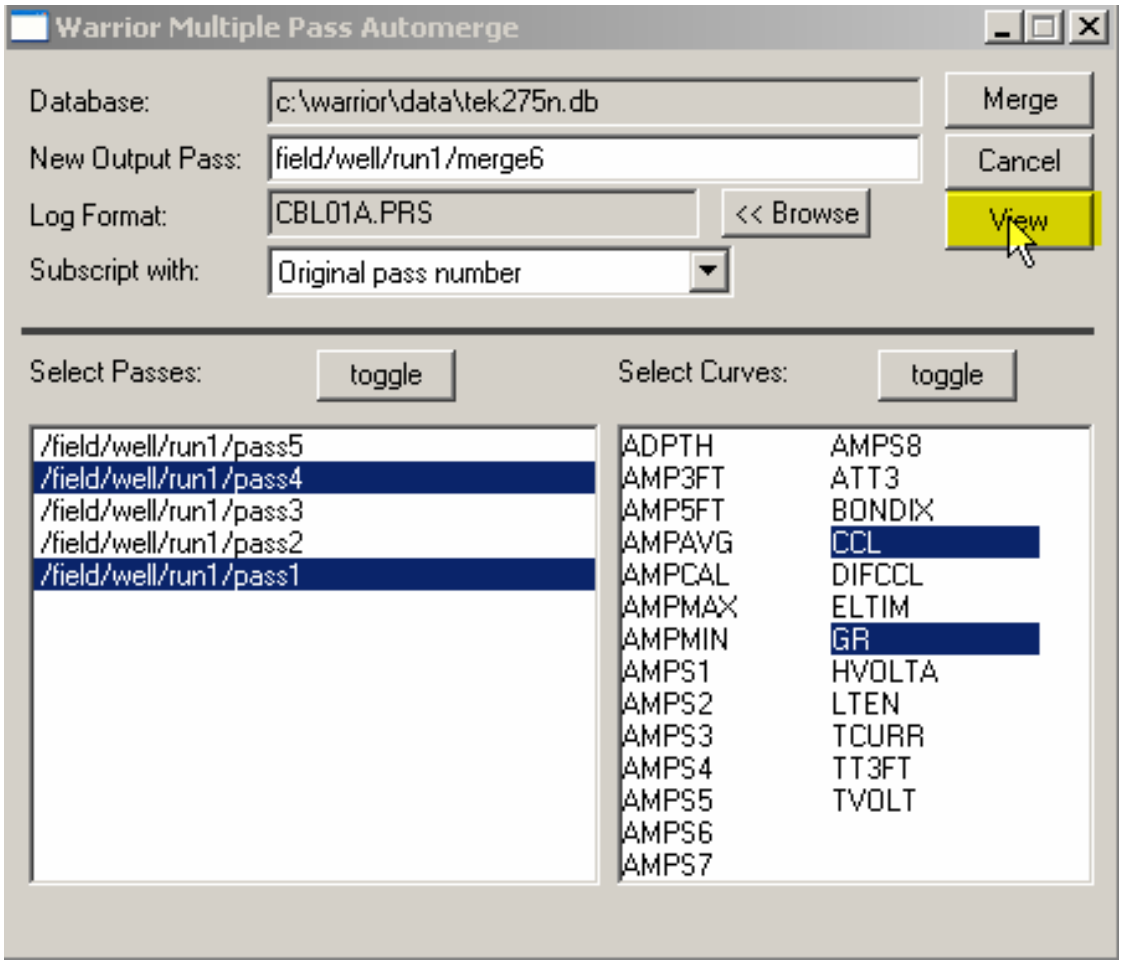


FIG: 13.96 View option

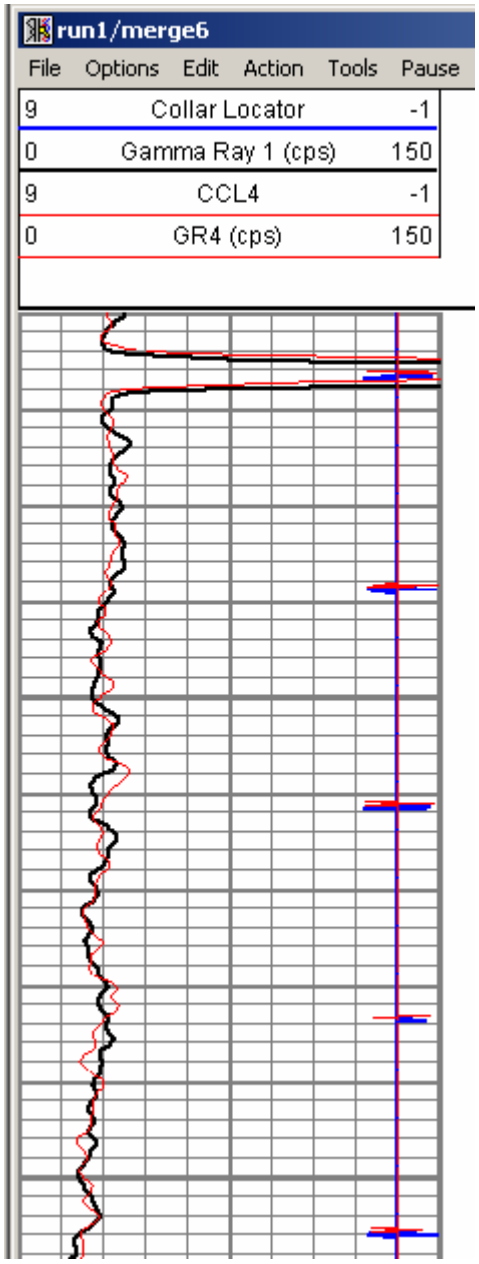


FIG: 13.97 Plot the new add curves

VIDEO: 13.7 AutoMerge

13.5.3 Edit Variables in a Dataset

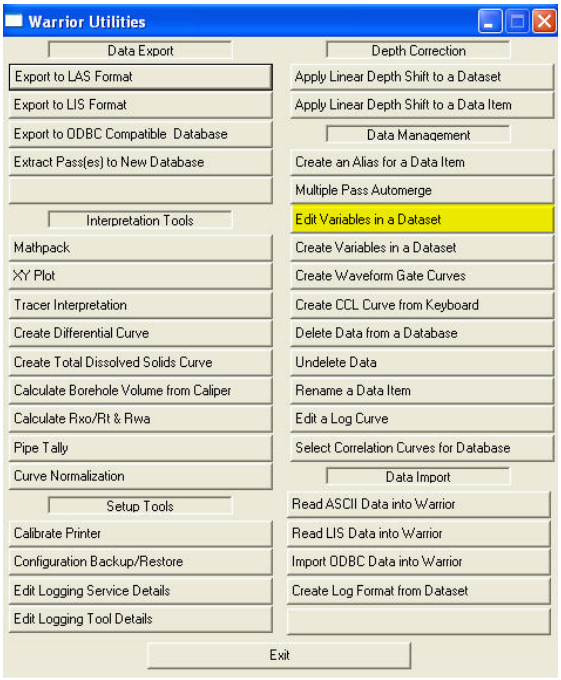


FIG: 13.98 Edit Variables in a Dataset

See Section 4.5.2

13.5.3 Create Variables in a Dataset

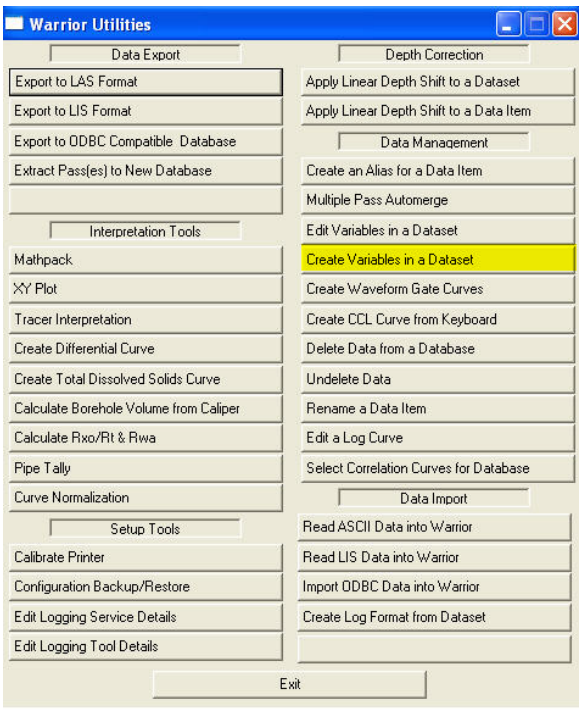


FIG: 13.99 Create Variables in a Data set.

13.5.6 Create Waveform Gate Curves

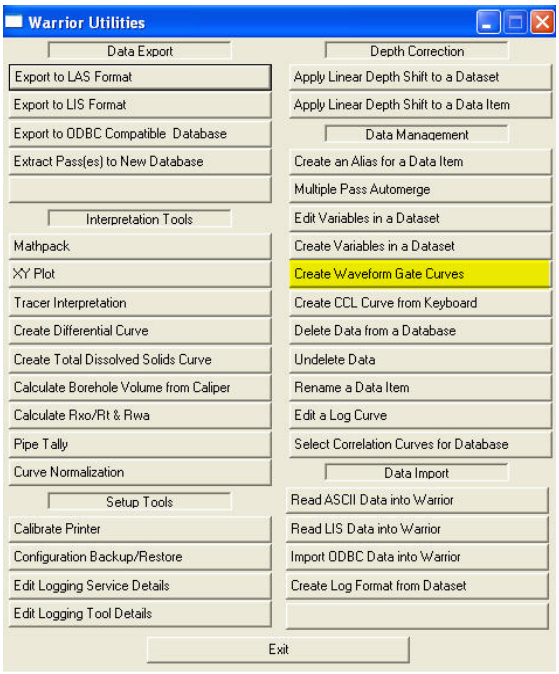


FIG: 13.100 Create Waveform Gate Curves

13.5.6 Create CCL Curve from Keyboard

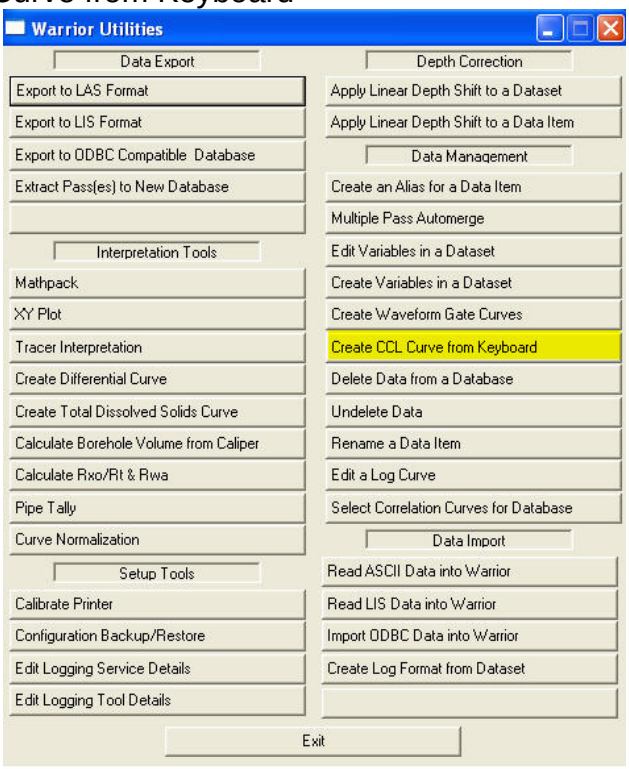


FIG: 13.101 Create CCL Curve from Keyboard

13.5.7 Delete Data from a Database

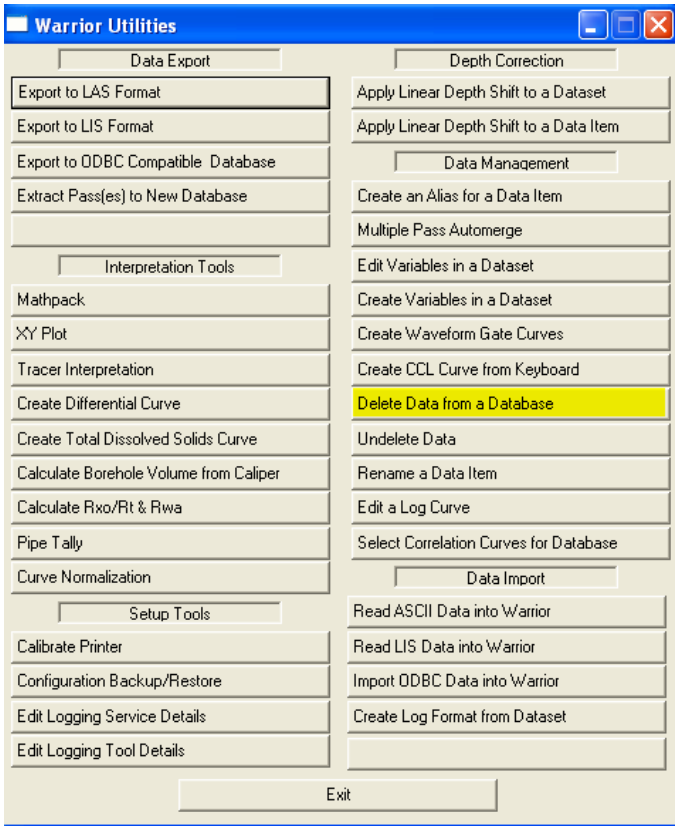


FIG: 13.102 Select Delete data from a Database

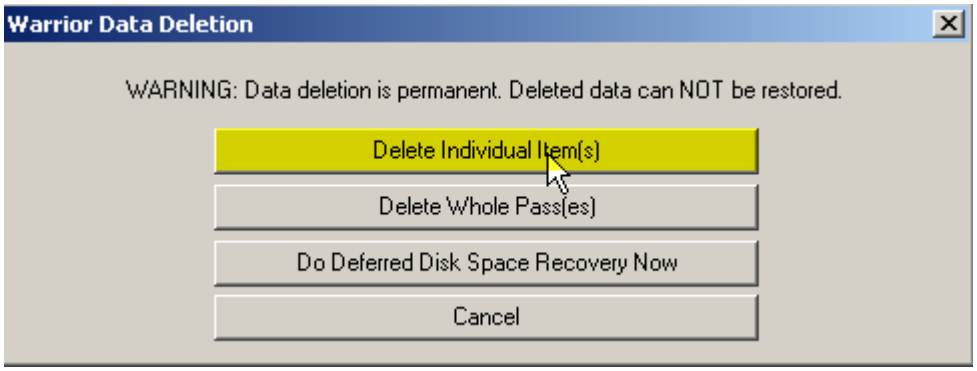


FIG: 13.103 Delete Individual Item(s)

To delete a database item e.g. a curve, click on Delete Individual Item(s). The standard database file selection dialog appears.

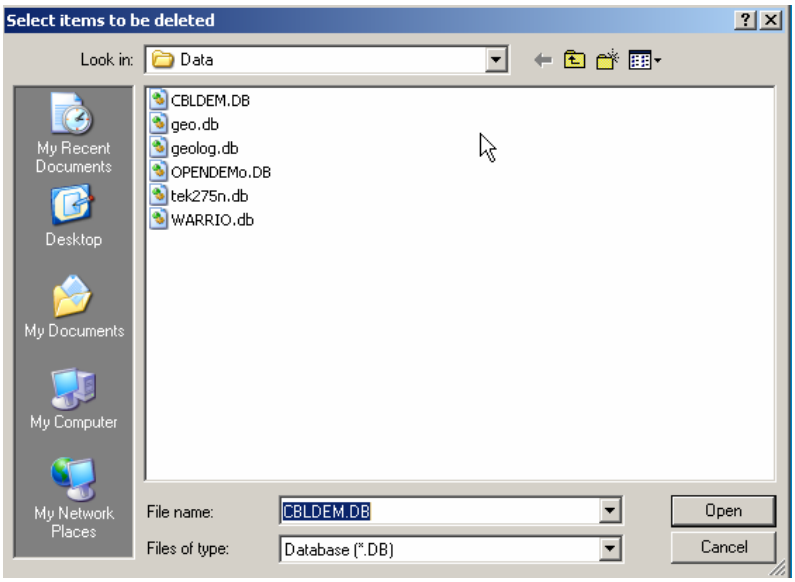


FIG: 13.104 Select Database

After selecting the database, the dialog for selection of the data item appears.
Select the data item(s) to be deleted. All or no items may be selected by using the Toggle button.

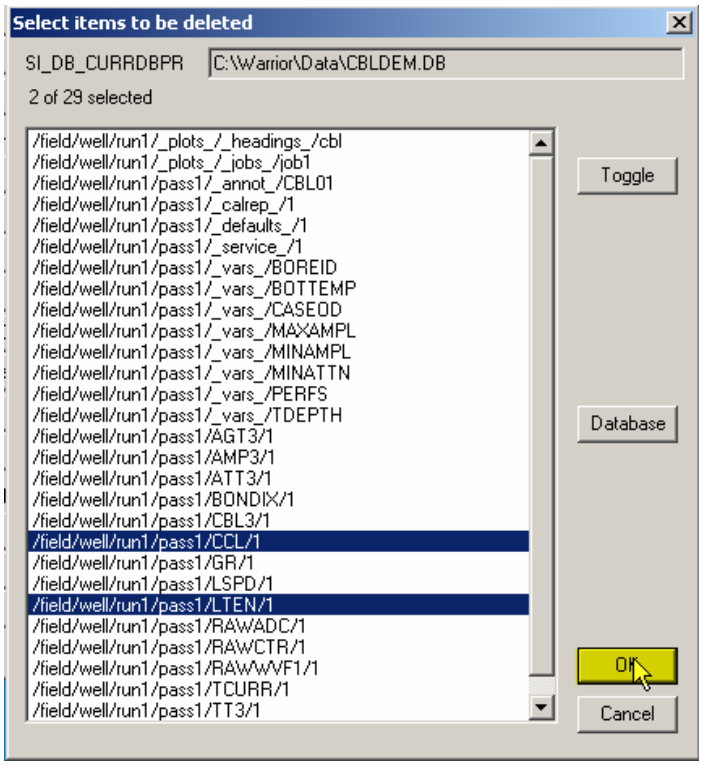


FIG: 13.105 Select Items

A warning message appears informing that permanent data deletion is about to take place.

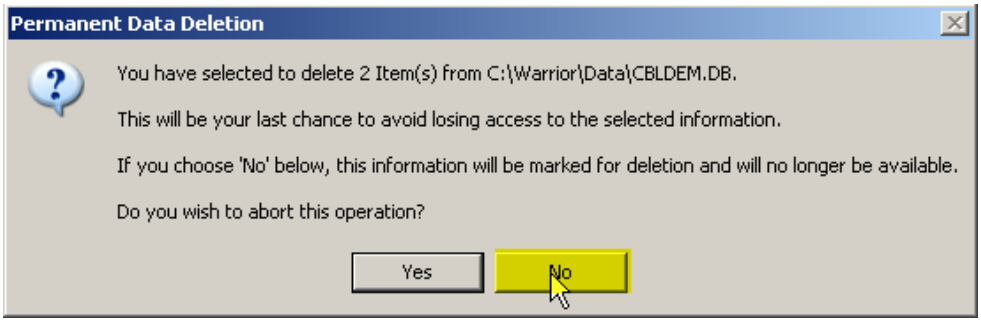


FIG: 13.106 Permanent Data Deletion

Warning! **DATA DELETED WITH THIS UTILITY CANNOT BE RECOVERED**

Clicking Yes in the above aborts the operation. Clicking No proceeds with the operation and allows the choice to repack the database file immediately or to defer the operation until later.

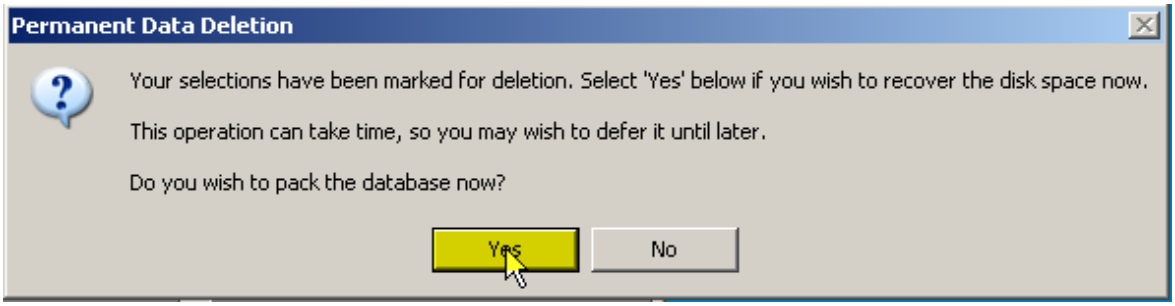


FIG: 13.107 Deletion

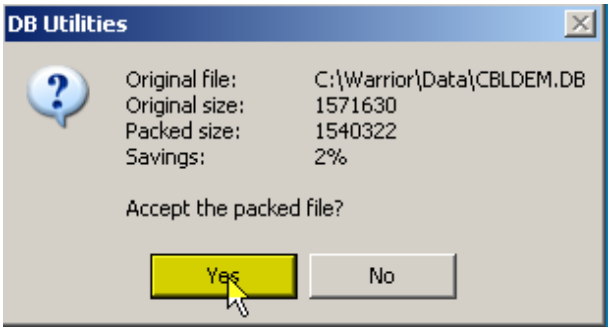


FIG: 13.108 Packing

Clicking Yes causes the data item to be removed and the database repacked immediately and clicking No marks the data item for deletion, buts defers the packing of the data base.

VIDEO: 13.8 Deleted data

13.5.8 Undelete Data

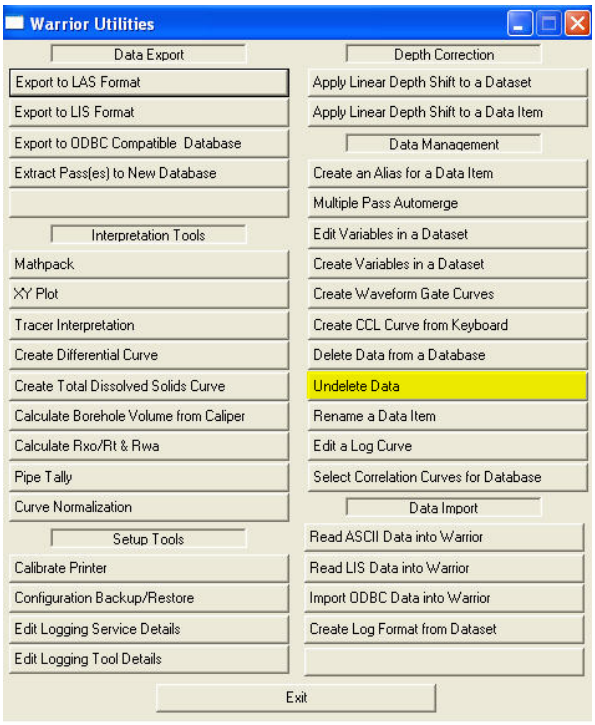


FIG: 13.109 Undelete Data

13.5.9 Rename a Data Item

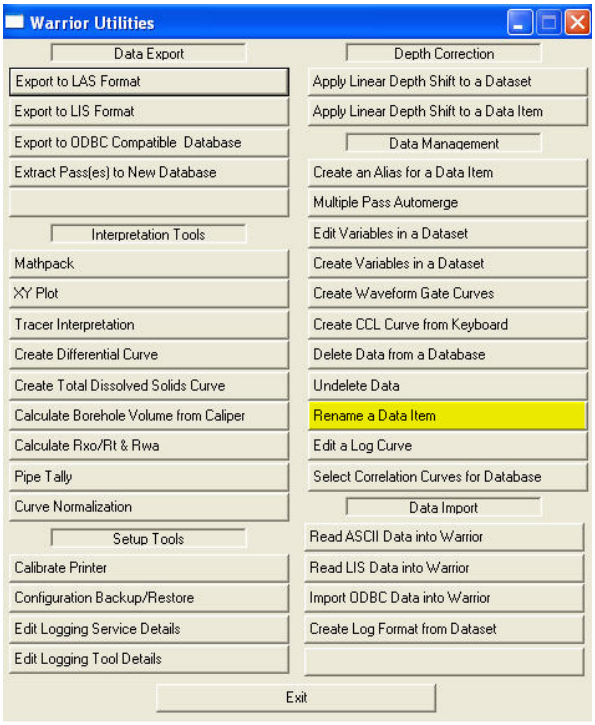


FIG: 13.110 Rename a Data Item

13.5.10 Edit a Log Curve

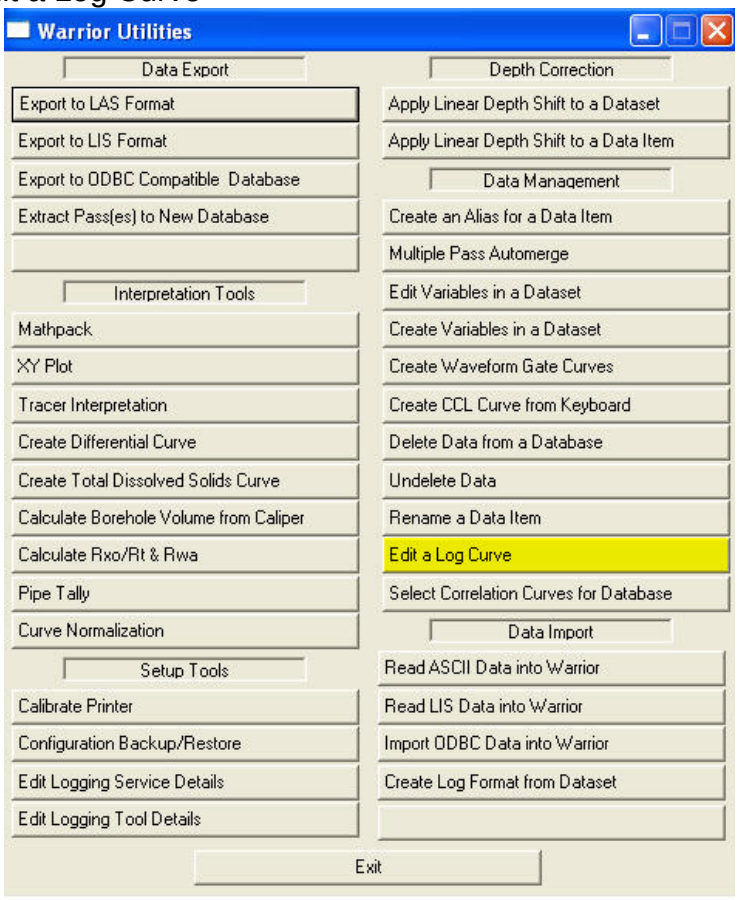


FIG: 13.111 Edit a Log Curve

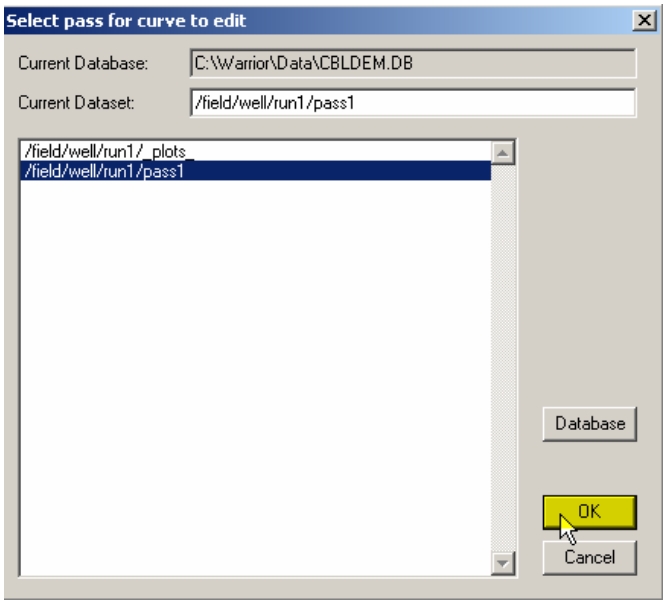


FIG: 13.112 Select Pass for Curve to edit

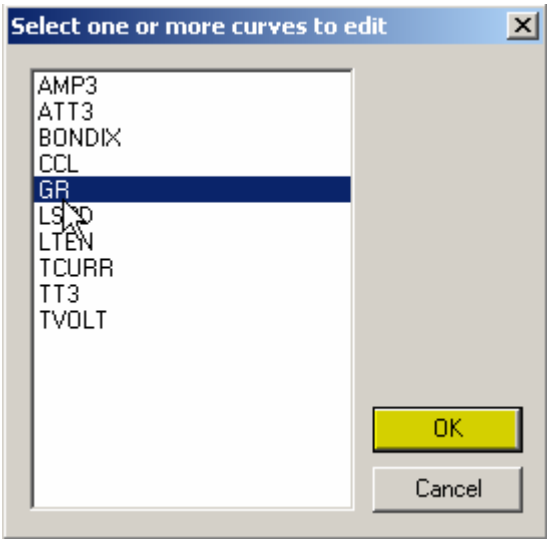


FIG: 13.113 Select Curve

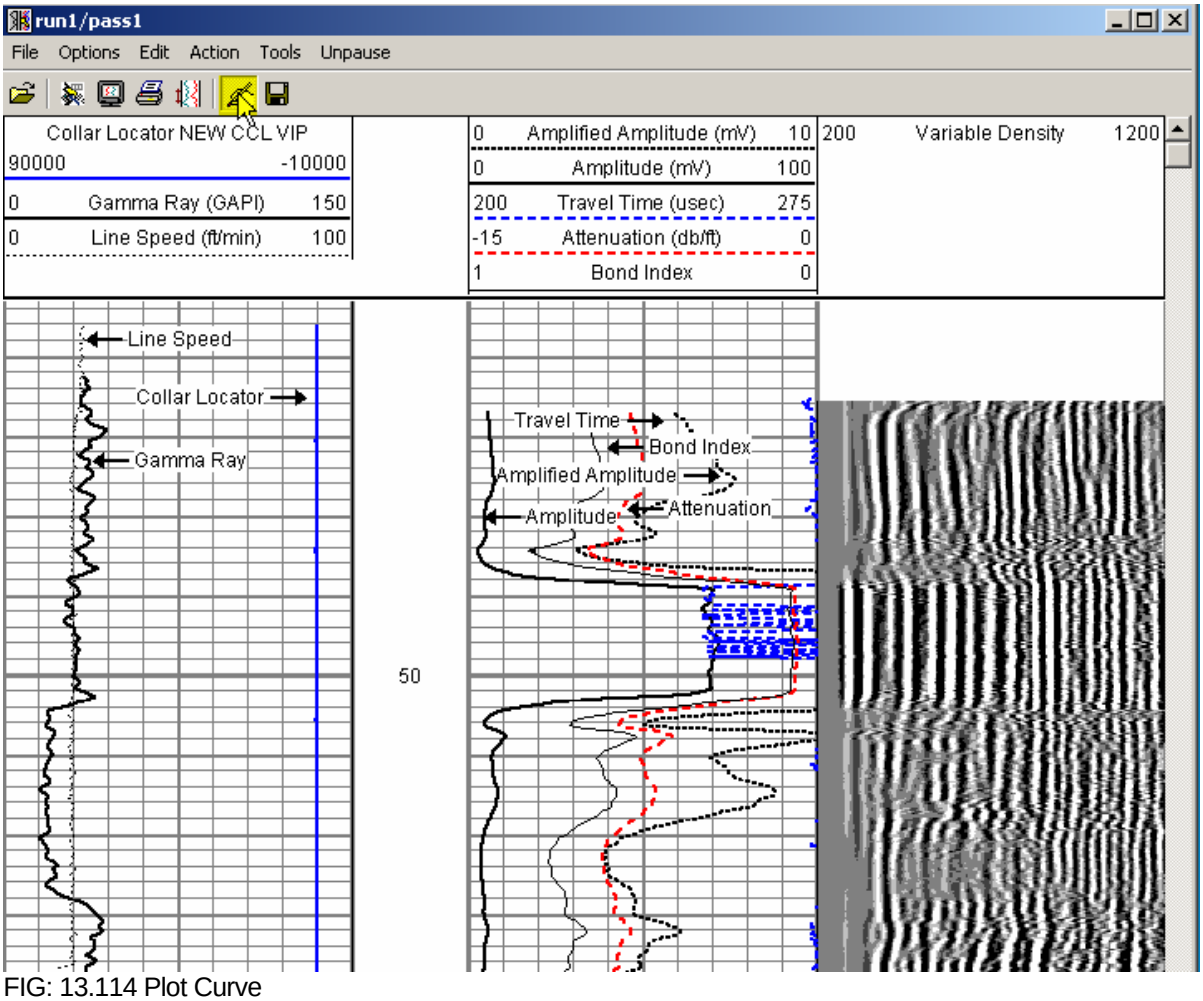


FIG: 13.114 Plot Curve

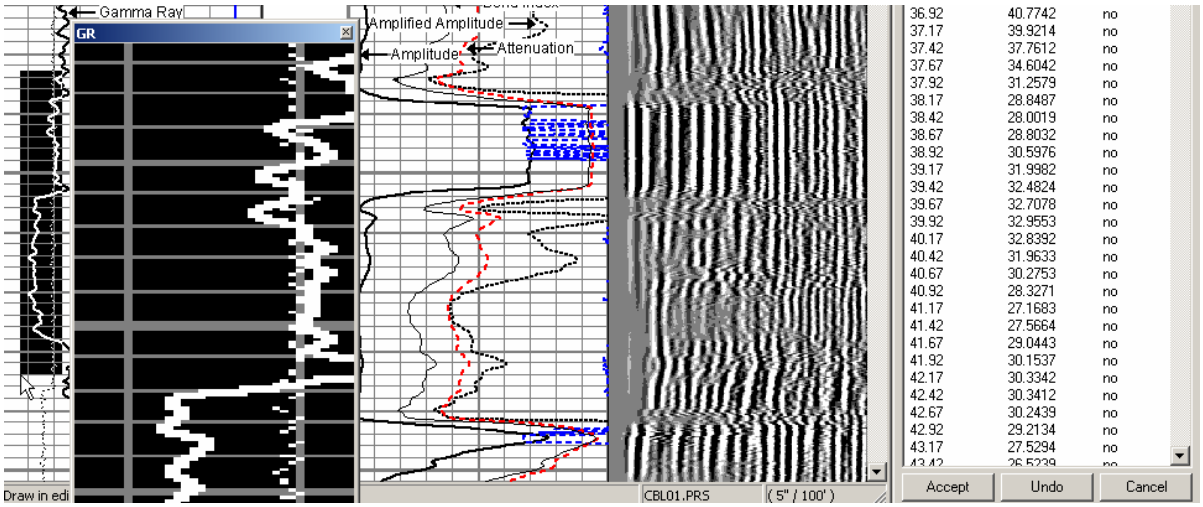


FIG: 13.115 Zoom Curve

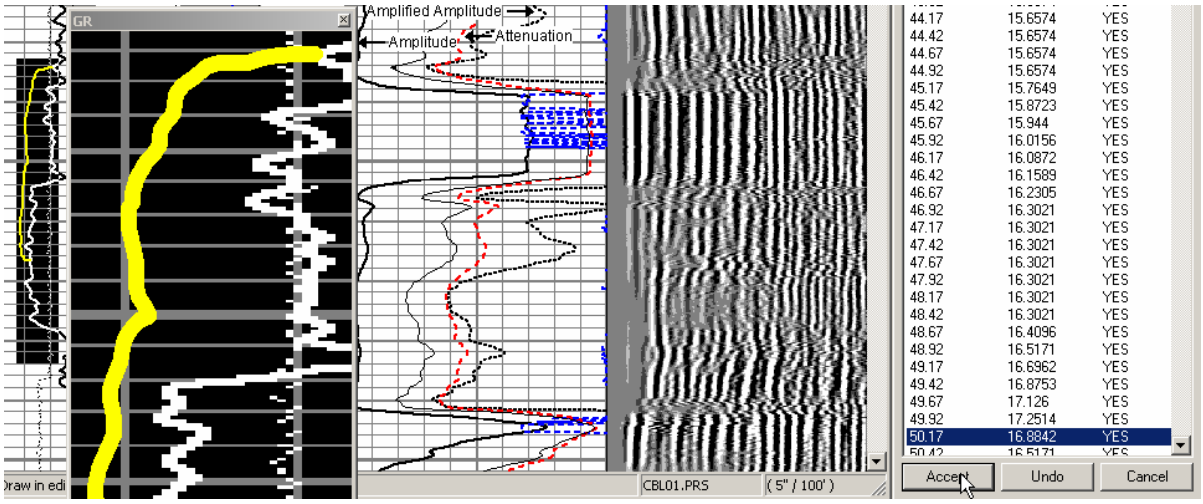


FIG: 13.116 Draw Curve

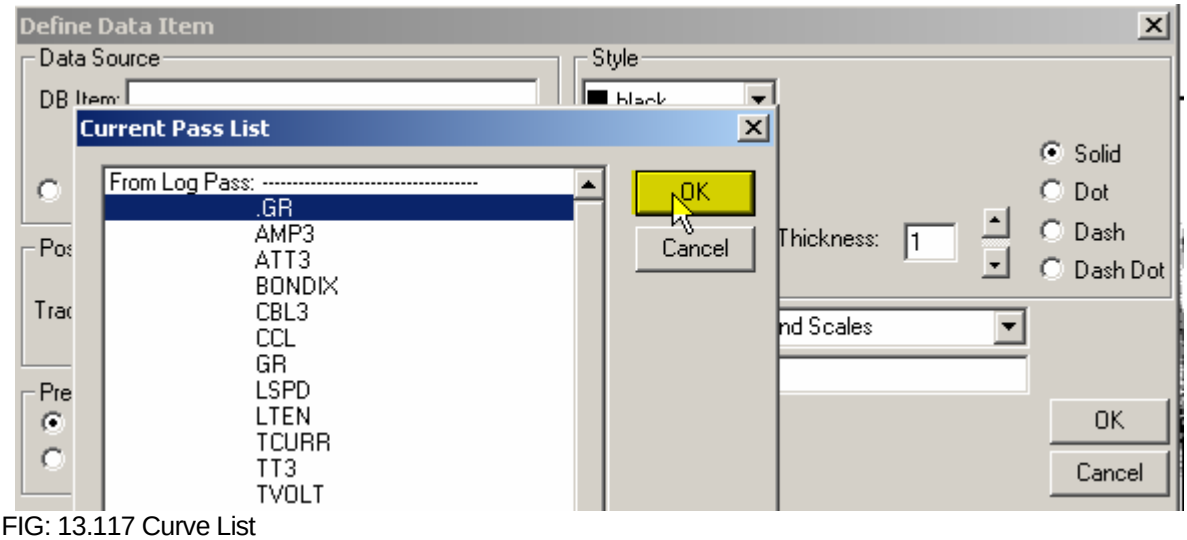


FIG: 13.117 Curve List

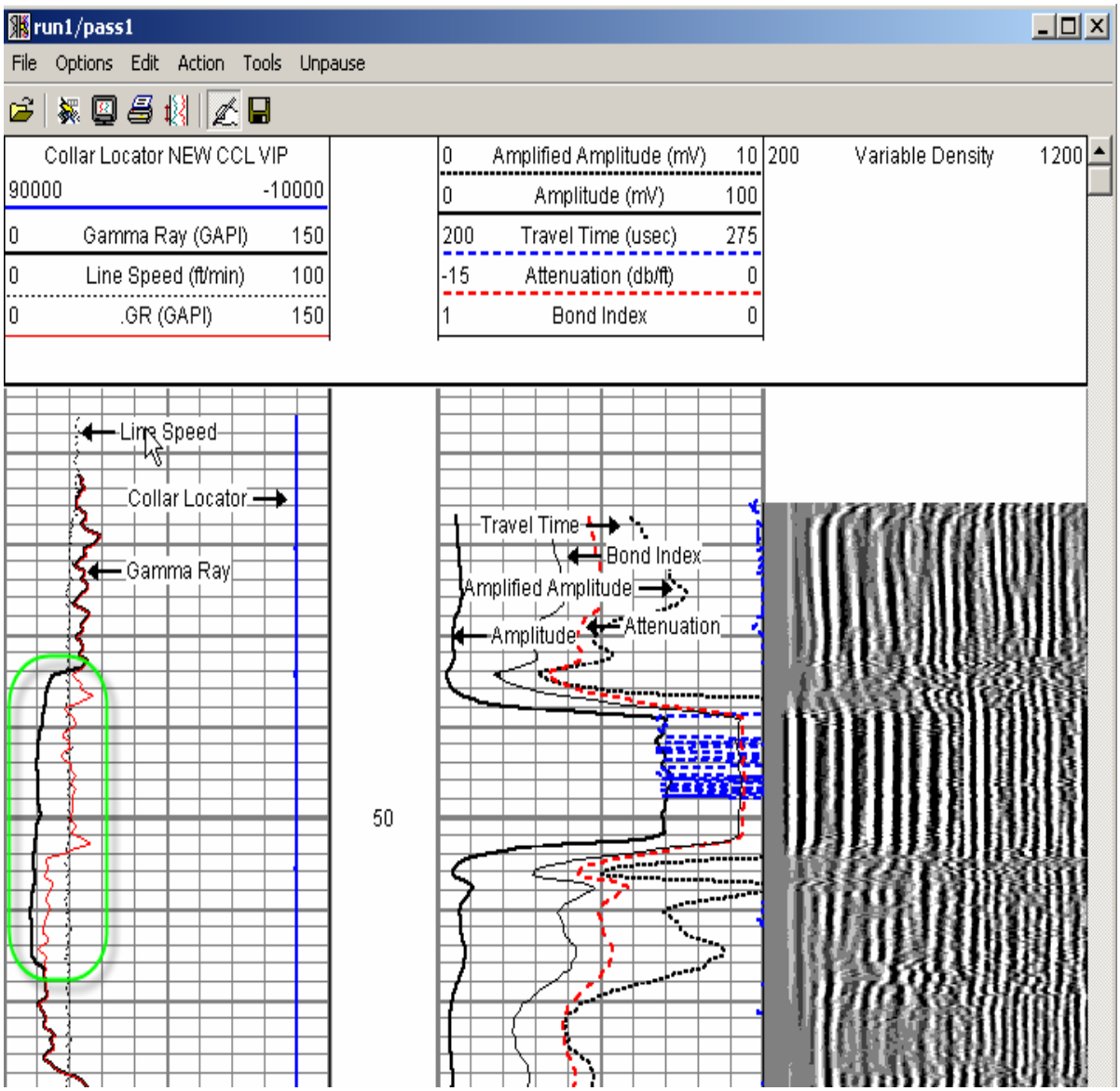


FIG: 13.118 Plot Curves

13.5.11 Select Correlations Curves from Data Base

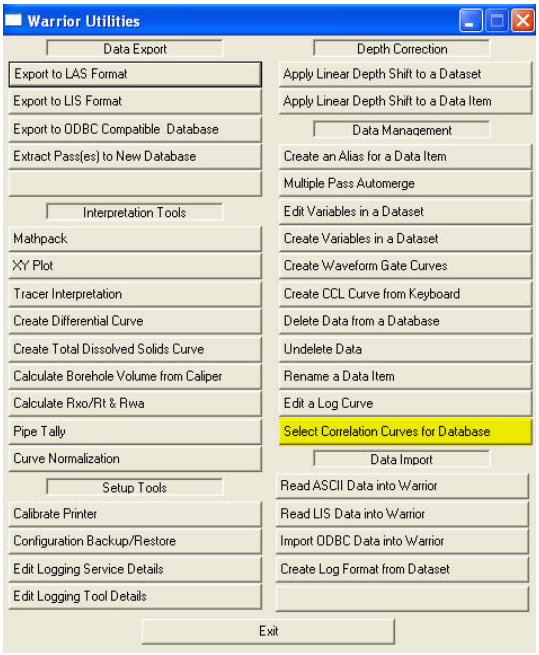


FIG: 13.119 Select Correlation Curves to for Database

13.6 Setup Tools

13.6.1 Calibrate Printer

In Utilities click on the Calibrate Printer button.

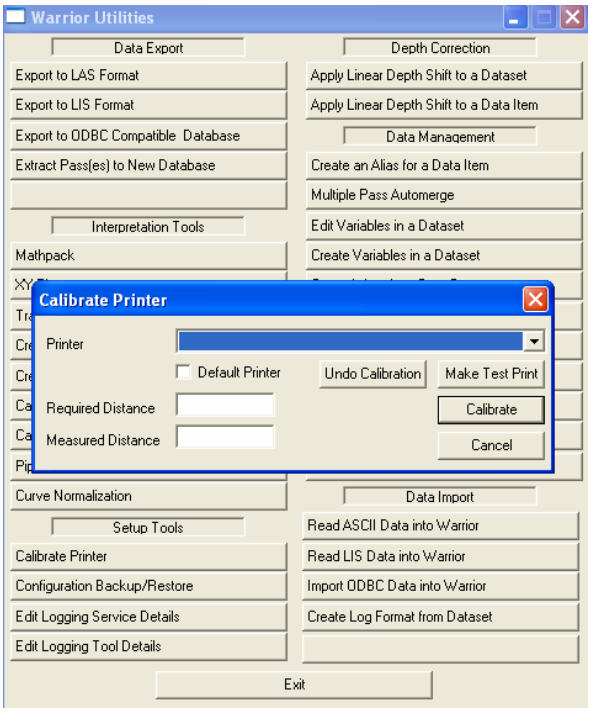


FIG: 13.120 Select Calibrate Printers

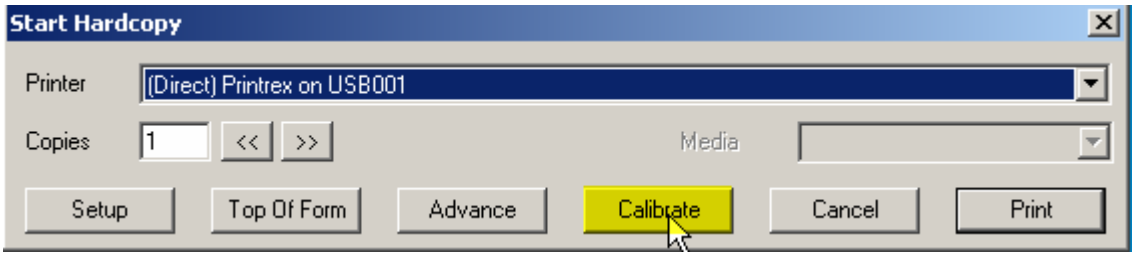


FIG: 13.121 Select from Hardcopy Calibrate

Select the printer to calibrate using the selection box. This printer may be made the Default Printer by checking the Default Printer box.

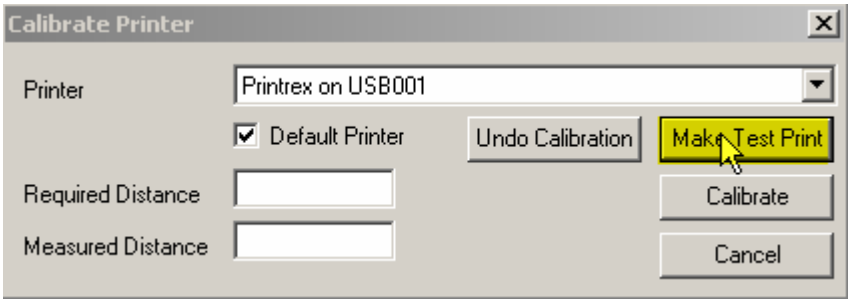


FIG: 13.122 Select Make Test Print

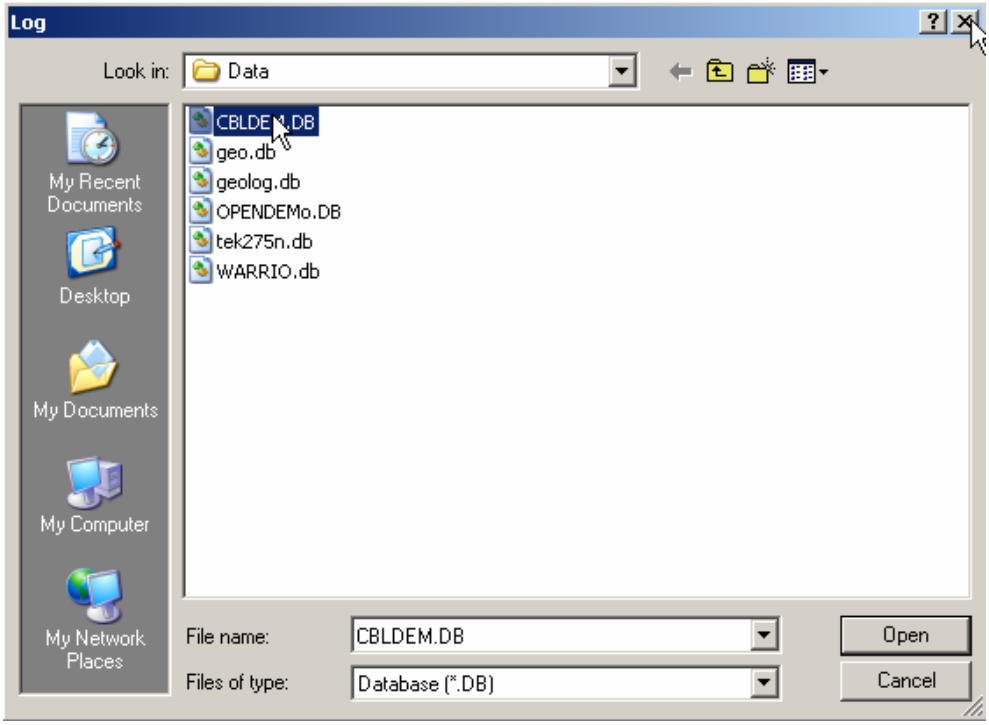


FIG: 13.123 Select Database to Plot

The calibration is based on two parameters entered by the user. Enter the required length of print output for any given log interval, e.g. 10 inches for 200 feet of log on a 5-inch scale (5 in = 100Ft).
It means Scale 1: 240. Enter the actual length of plot currently output by the plotter for the same log interval. Press Calibrate.

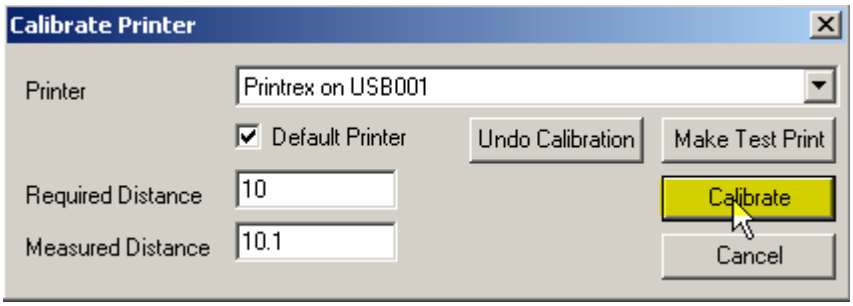


FIG: 13.124 Calibrate

Note that the required length can be any length, so that the current hardcopy may be forced to match any correlation log, even one with an incorrect hardcopy scale.

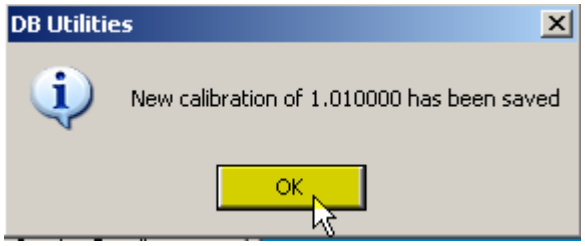


FIG: 13.125 Click on OK

VIDEO: 13.9 Printer Calibration

13.6.2 Configuration Backup/Restore

Every computer system will, sooner or later, suffer a failure, like a disk crash, where potential loss of programs and/or data is possible. This will generally happen at the most inconvenient time. **The importance of keeping current backups cannot be overemphasized**. It is vital that current backups are kept of all essential programs and data.

The warrior system is usually configured for the selection of services to be run by a given client. This information is primarily contained in three files, namely warrior.ini, services.ini, and tools.ini. A copy of all your files customized can be backed up to USB Memory/Hard disk/Floppy disk by using Backup/Restore utility 'Configuration Files'.

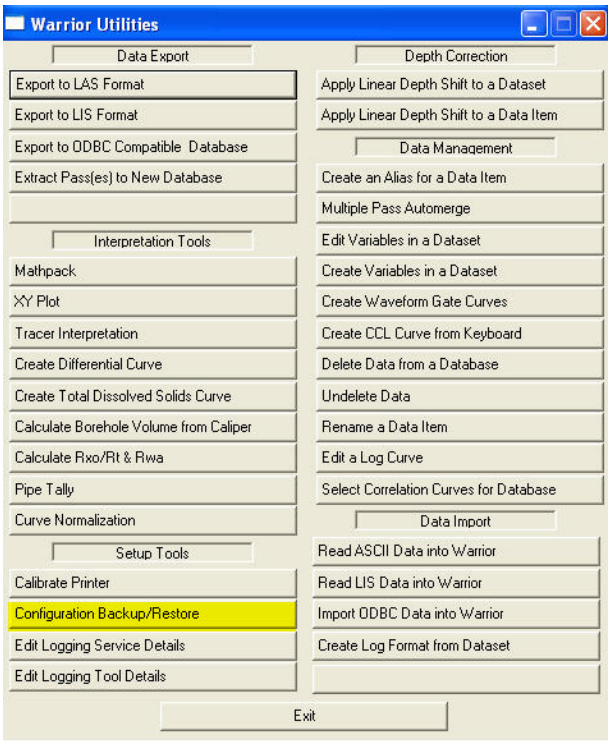


FIG: 13.126 Select Configuration Backup/Restore.

13.6.3 Configuration Files

Configuration files are the files that make one system different from another. This includes Tools.INI, Services.INI, Warrior.INI and other initialization files. It also includes presentation files, heading files, logo files, tool drawings, DSP scripts, external calibration files, and other files that are particular to a given system setup. They do not include any of the program files for Warrior since these are the same for every system with a given software revision.

A configuration file backup is normally made to removable media such as a floppy drive, CD, or a USB drive. There are two main purposes of a configuration backup. The first is to have a copy of files for a particular system off of the system in case of hard drive failure on the system. With a Warrior Installation CD and a configuration backup, the system can be restored to the same setup that was on the system when the configuration backup was made. The second purpose of a configuration backup is to transfer files, or portions on the files from one system to another.

The User selects whether to do a backup or a restore by clicking on the appropriate option. When the [Select Defaults] button is clicked, a predefined set of files is chosen to either backed up or restored. If the [Clear Selections] button is clicked, then no files will be selected at that time to be either backed up or restored. If the alternate option of Back up selected files or Restore selected files is chosen, the default files are then reselected. The User then may select additional files, or deselect certain files by clicking on the box to the left of the file name.

During a back up of configuration files, once the files have been selected, the User must select the Backup to file name. This can be done by either typing the path and file name into the Backup to text box, or by selecting the browse button to the right of the text box and selecting the drive and then typing in the file name. The selected files are then zipped and stored as the chosen file when the [Backup] button is clicked.

To restore files, the User must select both the Restore from file and the destination Restore to folder. The browse buttons can be used to select the appropriate files and folders. With few exceptions, the Restore to folder should be C:\Warrior\. When the Restore from folder has been selected, the Select files to restore window will show the files that are in the backup with the files to be restored indicated

with a check mark. The User then may select additional files or deselect files by clicking on the box to the left of the file name. When the [Restore] button is clicked, the selected files will be restored. Care should be taken when restoring files from one system to a different system. Warrior.INI contains the Keycodes for software access. If it is over written and the new Warrior.INI does not contain a valid Keycode for the system, access to the software will be denied.

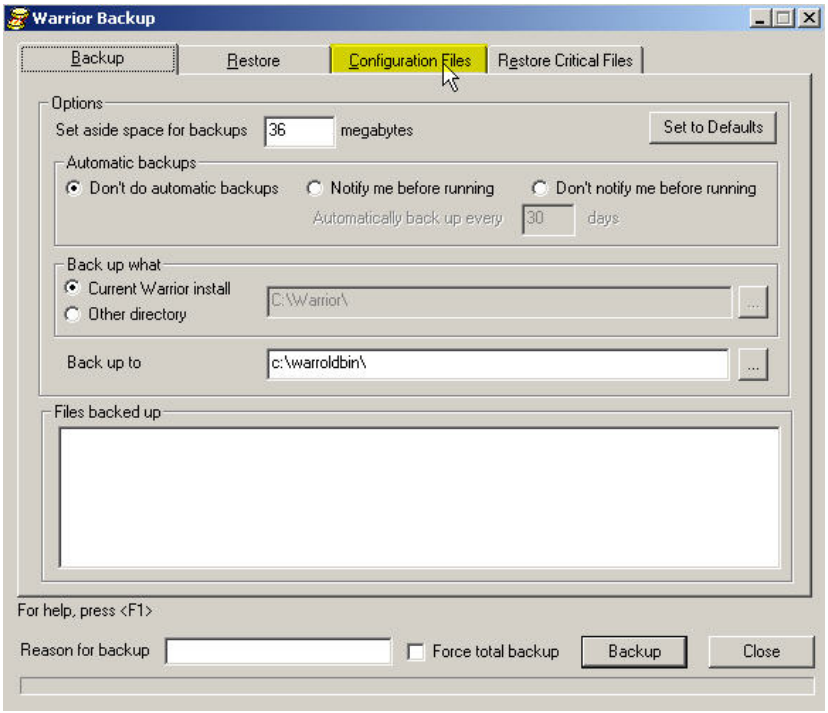


FIG: 13.127 Select the Configuration Files Tap.

If files are written to CD and subsequently restored to disk, they may be marked as read-only, which can prevent the proper operation of Warrior. This includes database files as well as configuration files. To change the attribute, use Windows Explorer, select the copied files, right click on them and select **properties**. Uncheck the 'Read Only' attribute and click the **Apply** button.

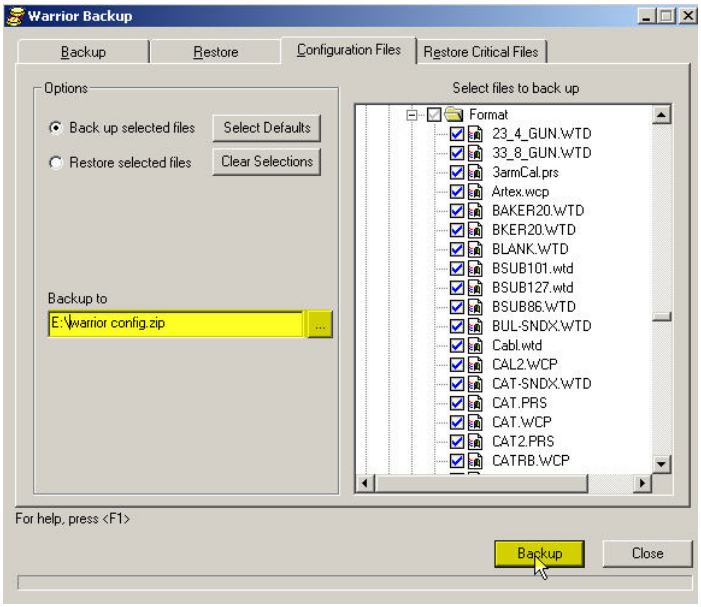


FIG: 13.128 Type Drive, File Name and Select Backup

13.6.4 Configuration Restore

There are three critical files that are required for acquiring data in a Warrior System. These are Warrior.INI, Tools.INI, and Services.INI. The User may select to do a backup when the computer is turned off after acquisition has been run. The maximum number of critical backups that will be retained is set to 50 by default.

With User supplied software, selected backup critical files may be compared with active files.

When the restore button is clicked, the selected set of critical files will be restored to the system.

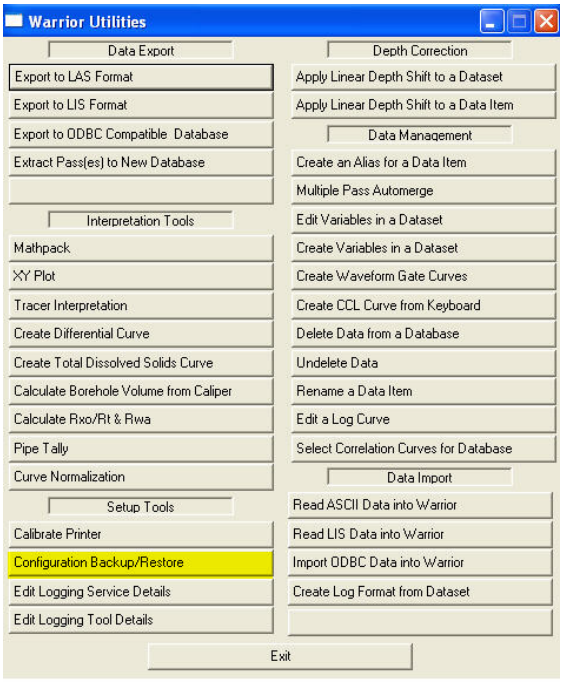


FIG: 13.129 Select Configuration Backup/Restore.

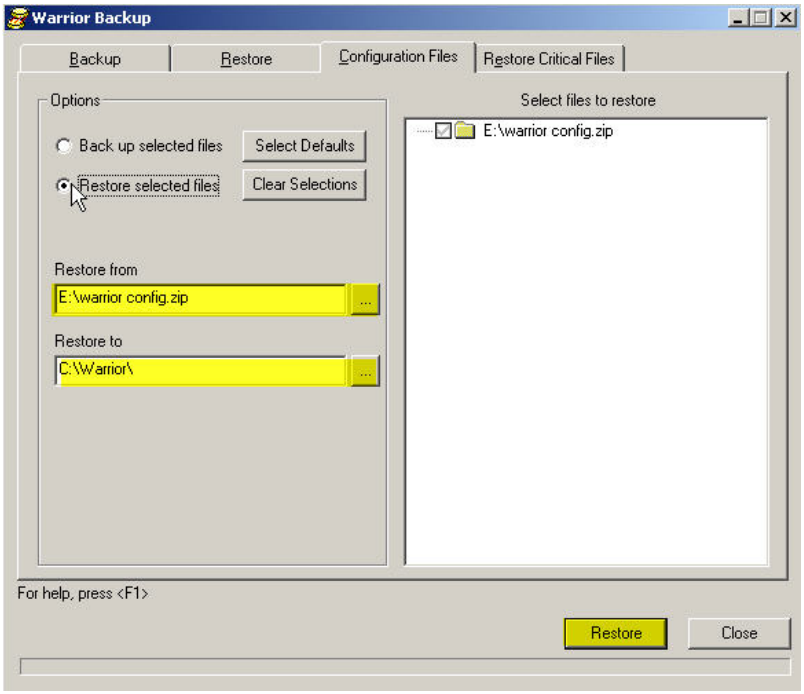


FIG: 13.130 Restore Select files

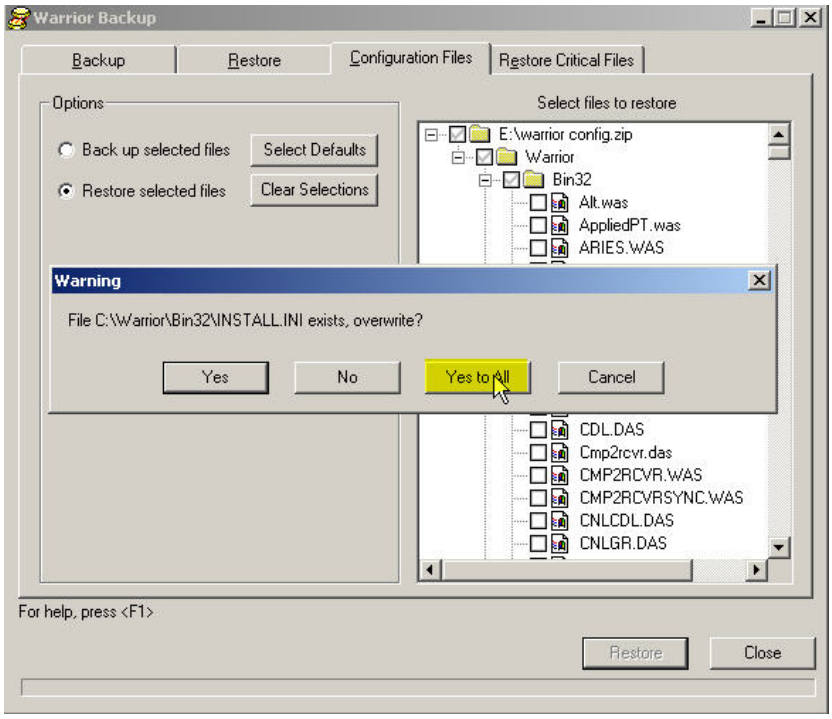


FIG: 13.131 Restore All Files

Restore of all your files customized can be restore from a USB Memory/Hard disk/Floppy by using Restore utility 'Configuration Files'. It means you restore all your presentations, tools string, services, key codes, etc.

13.6.5 Warrior Backup

Warrior Backup is a utility used to backup and restore Warrior Software files. This can be a full backup of all files or a partial backup of only the files that have changed since the last backup. It can also be a backup of only the configurations files that distinguish the system from other warrior systems.

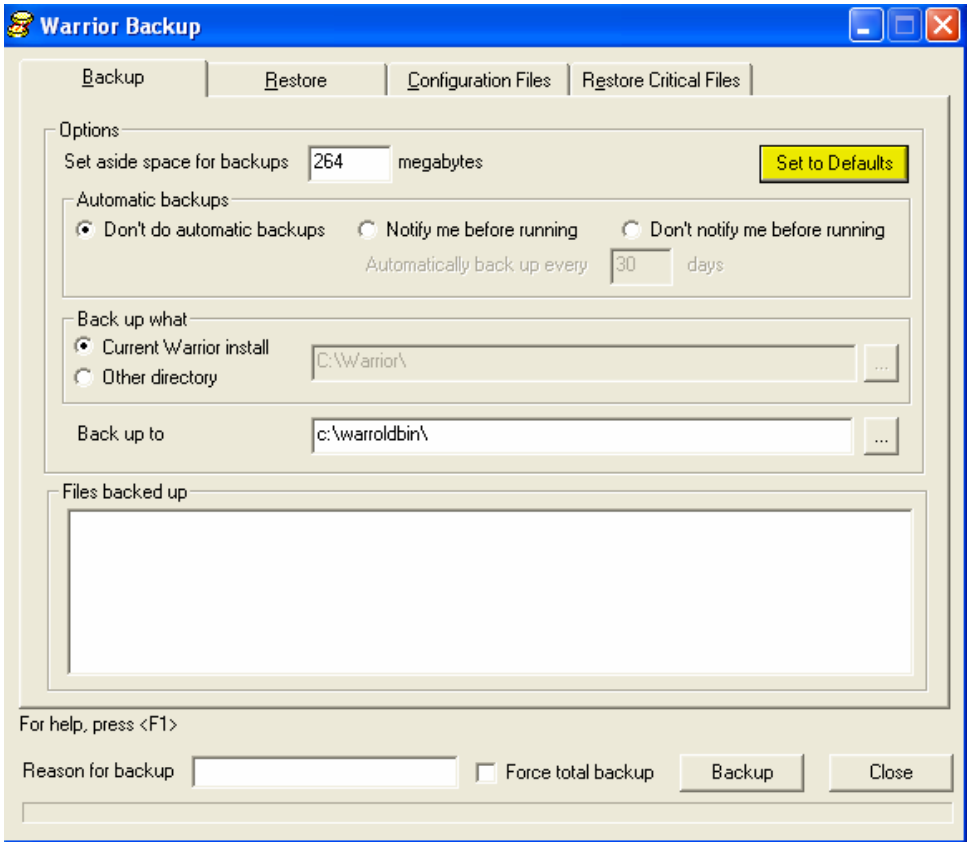


FIG: 13.132 Backup set to Defaults

There are two typical procedures to start Warrior Backup. The first method is to select Warrior Backup from the Warrior 7.0 program group that is normally placed on the Windows desktop or from the Windows program list. Warrior Utilities could also be selected in the same manner, and then click on the Configuration Backup/Restore selection under Setup Tools.

There are four page selections at the top of the Warrior Backup window, Backup, Restore, Configuration Files, and Restore Critical Files. Backup performs a backup of Warrior files to a drive on the computer. Restore will restore Warrior files done in a Backup into the Warrior folder on the computer. Configuration files for the Warrior System can be backed up and restored from this page. The three critical files, Warrior.ini, Services.ini, and tools.ini can be automatically backed up every time the computer is rebooted and then later restored from any of the backups. A short help file for each page is available by pressing the F1 key on the Keyboard.

13.6.6 Backup Page

The purpose of the Warrior Backup is to make a copy of the existing Warrior program, configuration, and auxiliary files. This is done so that if problems are found in files, either through the User making incorrect changes, a new bug in the software, or similar problems, then the User can restore the Warrior files to a know set of files that worked correctly for him.

There are several options that can be set before a backup is performed. By clicking the [Set to Defaults] button in the upper right of the page, many of these will be performed automatically. Either incremental or full backups can be done. The default is to do an incremental backup of only the files that have changed since the last backup.

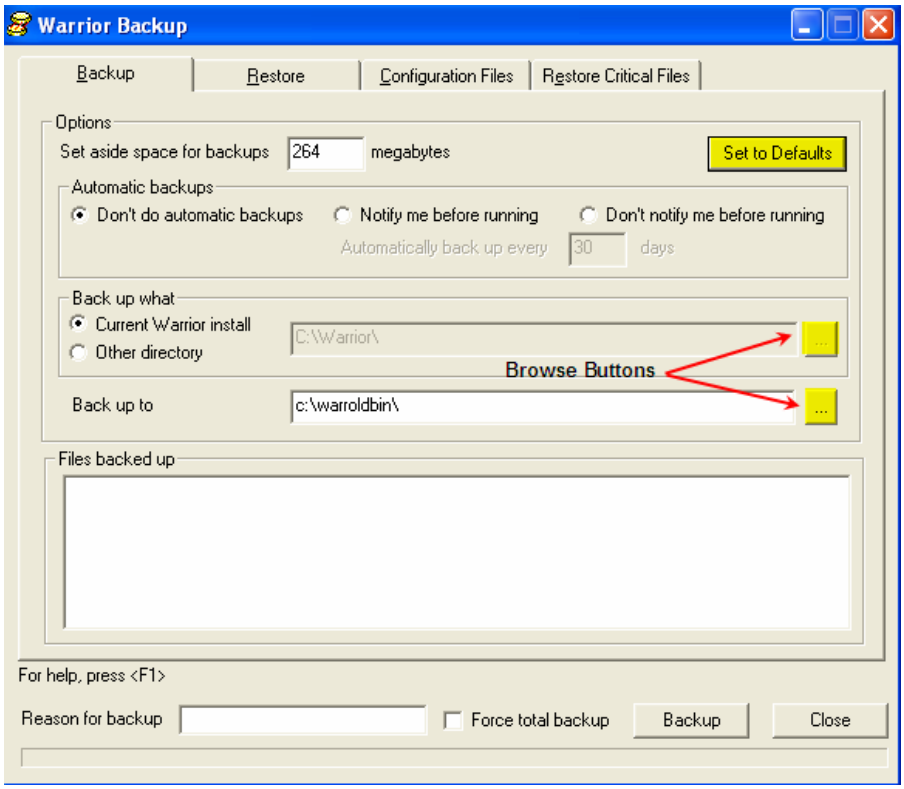


FIG: 13.133 Backup Browse

The maximum disk space that will be used for backup storage is initially set to 400 megabits. The default size will change depending upon the contents of the files in the Warrior Folder, but can be set by the User to any desired number of megabytes. If the maximum limit is exceeded, the User will be notified and asked if he wants to remove the oldest backup, this will be repeated until there is room for the backup to be completed or the User does not allow the oldest backup to be removed. The backup will then be performed, even if after the User has told it not to remove backups, it exceeds the maximum disk space set aside.

Automatic backups can be performed by the Warrior system or can be turned off. It is recommended that automatic backups be done. The User can select whether he is notified that a backup is about to be done or not. If he is notified, he can elect to cancel the backup at that time. The default frequency for automatic backups is 30 days but can be set by the user.

Normally the current Warrior installation directory is chosen for the files that are to be backed up, but the user can choose an alternate directory that contains Warrior files by clicking on the browse button. The backup location is initially set to the C:\warroldbin\ folder, but can be changed to a new or different folder by entering a new folder name in the text box, or by clicking on the browse button immediately to the right of the text box.

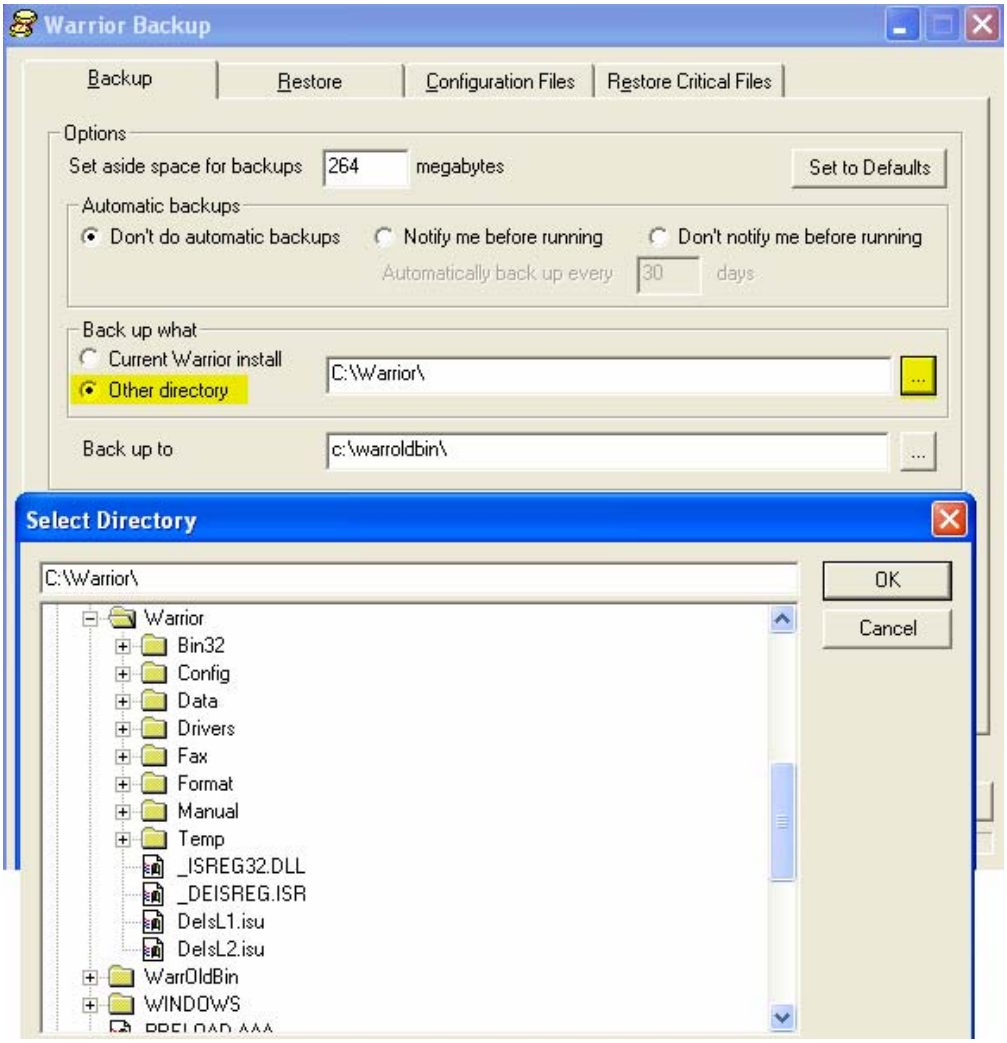


FIG: 13.134 Other directory Backup

A text box is provided for the User to add additional information as to the reason the backup was done. This is to aid in selecting an appropriate backup set to restore.
If a full backup of Warrior files is desired, then checking the Force total backup check box will do a backup of all files, otherwise an incremental backup of only the files that have changed since the last backup will be done.

13.6.7 Restore page

The restore page is used to restore the files made from previous Warrior backups that have been done on that particular system. Once the files have been restored, the system will be set up with the same files that it had when the restore was done.
The Restore from default directory is C:\warroldbin\ and the Restore to default directory is C:\Warrior\. Each of these directories can be changed by clicking on the browse button to the right of the text boxes.
Once a directory to restore from has been chosen, a list of Backup dates in that directory will be shown. Dates of full backups will be marked with an asterisk (*). When a date has been selected, a complete list of the files backed up on that date and a list of files that are different than the current files in the Restore to directory will be shown. Initially all files will be selected to restore. The User may wish to only restore certain files. He can do this by clicking on the [Clear Selected] button, then

clicking on the changed file that he wishes to restore. The User may restore multiple selections by holding down on the control key {ctrl} and then clicking on each file that he wishes to have restored.

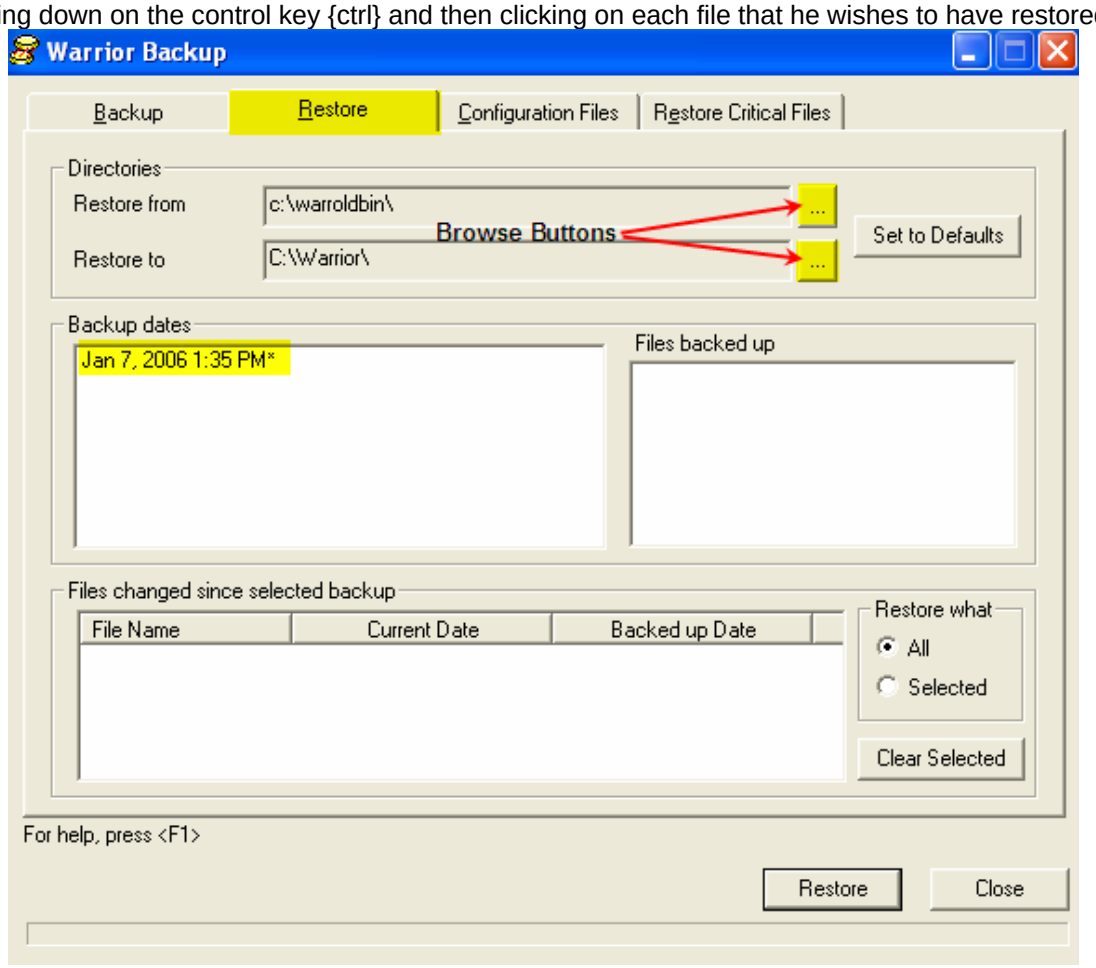


FIG: 13.135 Restore Browse

When the [Restore] button is clicked, the selected files will be restored to the Restore to directory.

VIDEO: 13.10 Backup/Restore

13.7 Edit Logging service Details

See Section 5

13.8 Edit Logging Tools Details.

See Section 6

Section

14

14 Corrupted Database

It is recommended to do a back up of the file before you begin this procedure.

Run Windows Explorer.

Warrior 16 Bit versions. Go to the C:\warrior\bin directory.

Warrior 32 Bit versions. Go to the C:\warrior\bin32 directory.

Find a file called dbdump.exe.

Double click on dbdump.exe.

This will open a window called Warrior Database Dumper.

In this window click on file and click on Dump Records.

Select corrupted database.

Click on file again and click on Scan Linkage.

Select corrupted database.

Click on file again and click on Scan Data Blocks.

Select corrupted database.

Close the Warrior DataBase Dumper Window.

There will be three new files in the c:\warrior\data directory.

They will have the same name as the corrupted database with the following extension: dsc, scn, and dmp.

Email these three files to sds.info@warriorsystem.com

The programmer will attempt to create a patch. The patch will be Emailed back to you and you will run dbdump.exe again from the c:\warrior\bin directory 16 Bit Software, c:\warrior\bin32 32 Bit software.
From the Data Base Dumper Window click on file, then click on Patch. Select corrupt database and following instructions in Email.
An example of a patch is attached below.
Example of Patch for data base 14377.db.
A set of patch number will be supplied by Scientific Data Systems, Inc.
Long word patch:

Hex offset	Old Hex Value	New Hex Value
000000D8	02149C8A	037FFD5A
00000378	02147B86	02112D6C

This is an example so do not use these numbers, the correct numbers will be supplied by Scientific Data Systems, Inc.
Open Dbdump.exe by double clicking on the file.

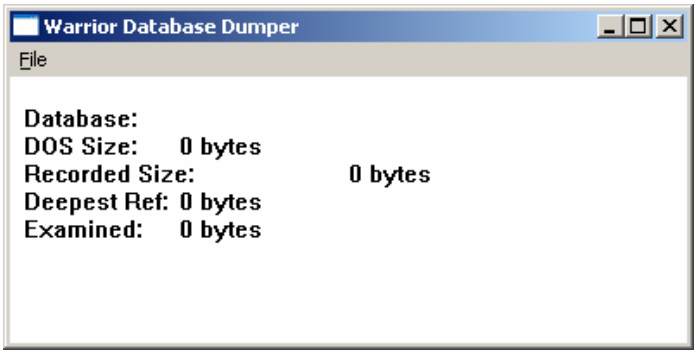


FIG: 14.1 Run Dbdump.exe

Click on File and then click on Patch:
The Select Database for Manual Patch window will appear.
Select the corrupted database and click on open.

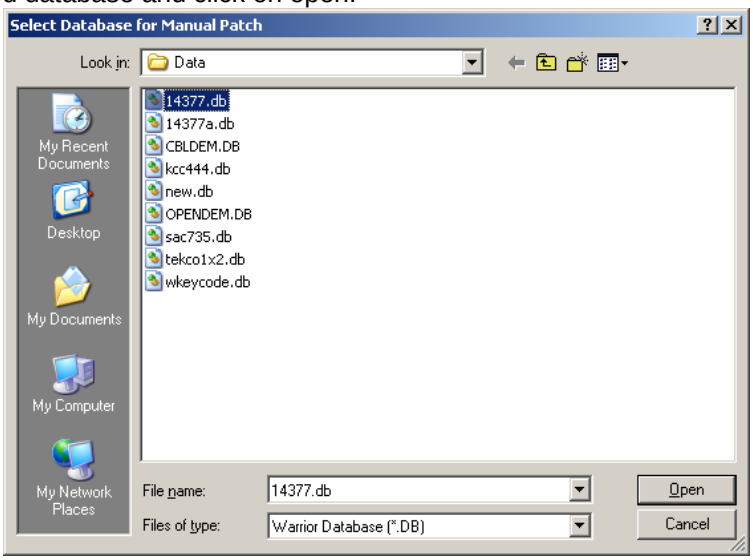


FIG: 14.2 Select Database

The Manual Patch window will appear:
Do not enter anything in the Password box.

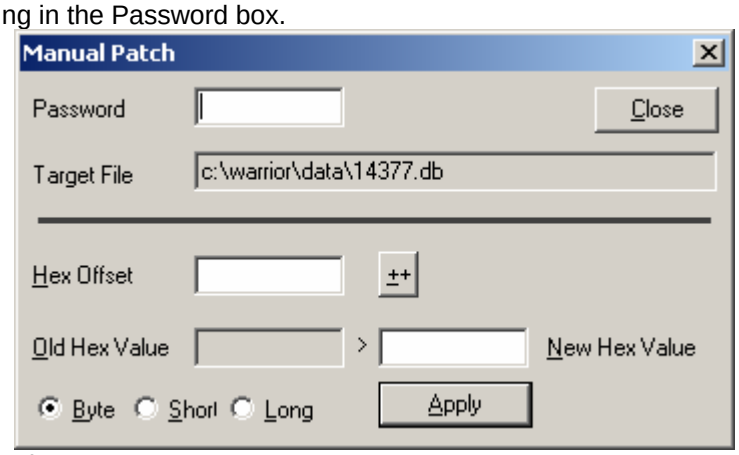


FIG: 14.3 Manual Patch

Long word patch:

Hex offset	Old Hex Value	New Hex Value
000000D8	02149C8A	037FFD5A
00000378	02147B86	02112D6C

Select The Long Button, enter the Hex Offset number, the Old Hex Value will appear enter the New Hex Value, press apply.
If more than one patch set of numbers were supplied enter the next set and select apply.

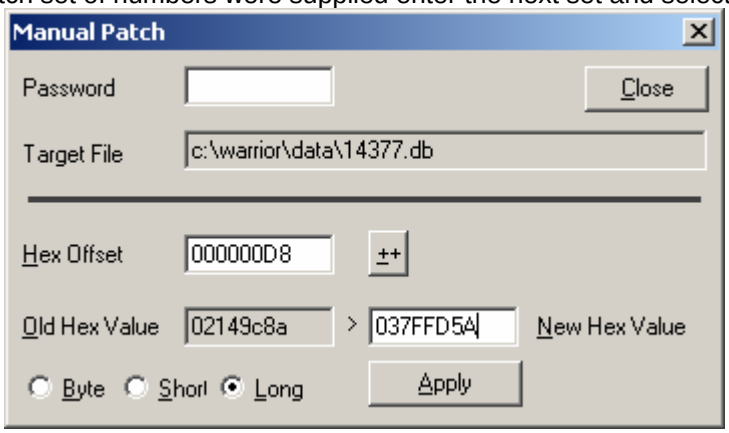


FIG: 14.4 Set values

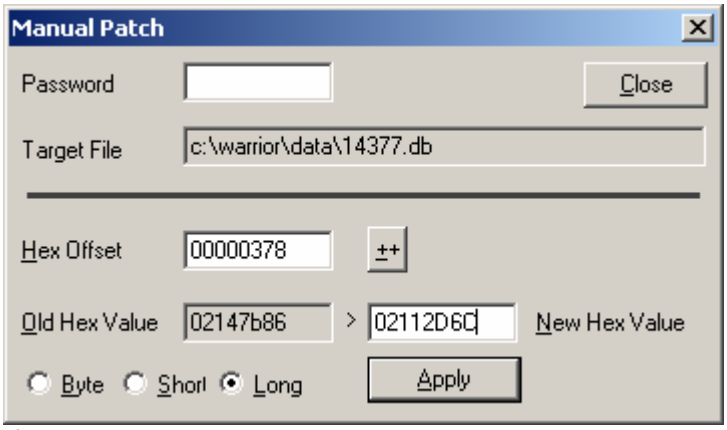


FIG: 14.5 Apply and Close

Close the Manual Patch window, and the Warrior Database Dumper window. The database should be accessible.

Section

15

15 Math Pack

A math pack output is created by a formula applied to one or more values from existing databases. A math pack job consists of one or more math pack outputs. Each math pack job is saved in a file with the extension ".wmp".

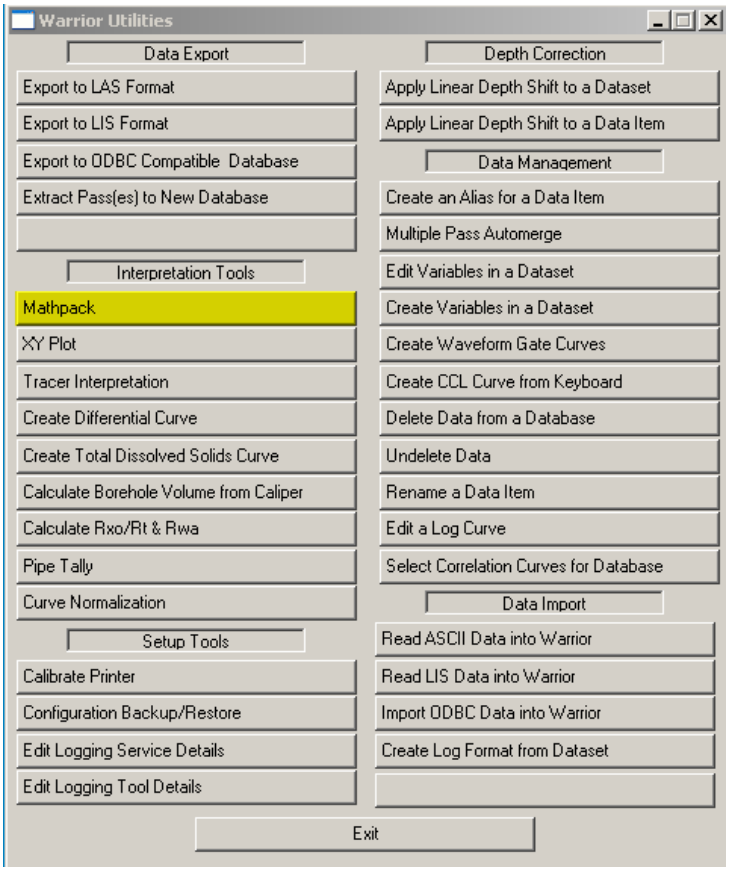


FIG: 15.1 Warrior Utilities-Math Pack

Math Pack user interface
The Math Pack job file contains:
A presentation file name and scale.
Each output name, output units, data id, sample rate, description, and the formula used to create the output.
The units for each input variable.

Math Pack can be run from the command line - "Math Pack.exe [wmp file name]" to load a job file When the program loads. Note that the presentation file and scale will not be necessary if a Report is being generated.

15.1 File Menu

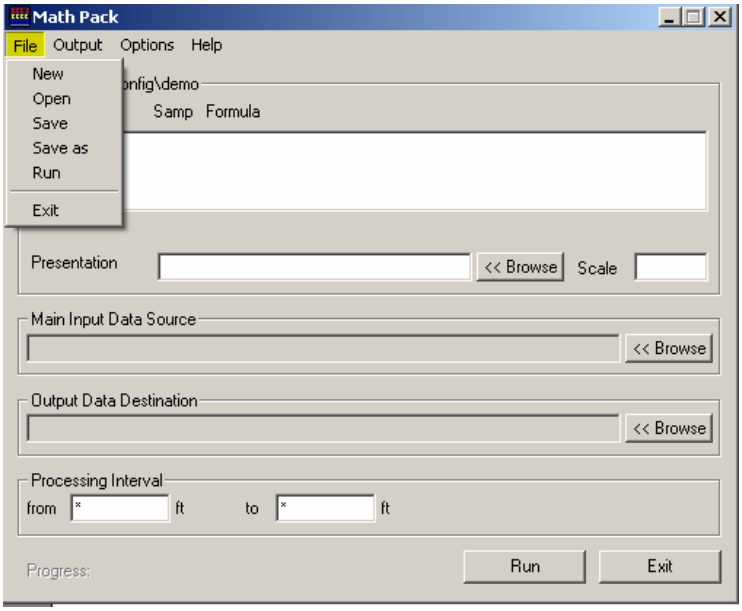


FIG: 15.2 Math Pack window.

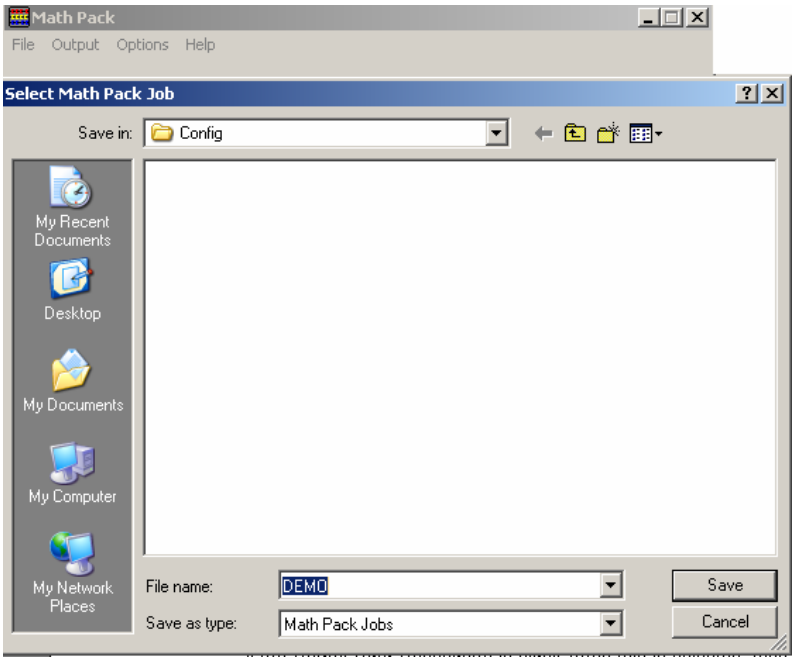


FIG: 15.3 Save Math Pack Job

The file menu controls the Math Pack job files. The default directory for Math Pack jobs is "Warrior\Config". The default extension is ".wmp".

15.2 Output

Each output requires a formula to create the output.
To create a formula, either select **Output/Add** from the main menu, or press the Insert key when inside the Output box in the Math Pack window.
To delete a formula, first highlight the formula to be deleted. Then either select **Output/Delete** from the main menu, or press the **Delete** key.
To edit a formula, first highlight the formula to be edited. Then either select **Output/Edit** from the main menu, or press the **Enter key.**

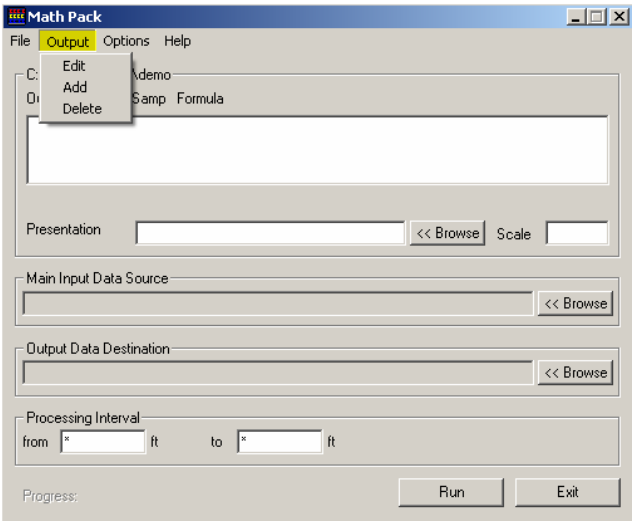


FIG: 15.4 Output options

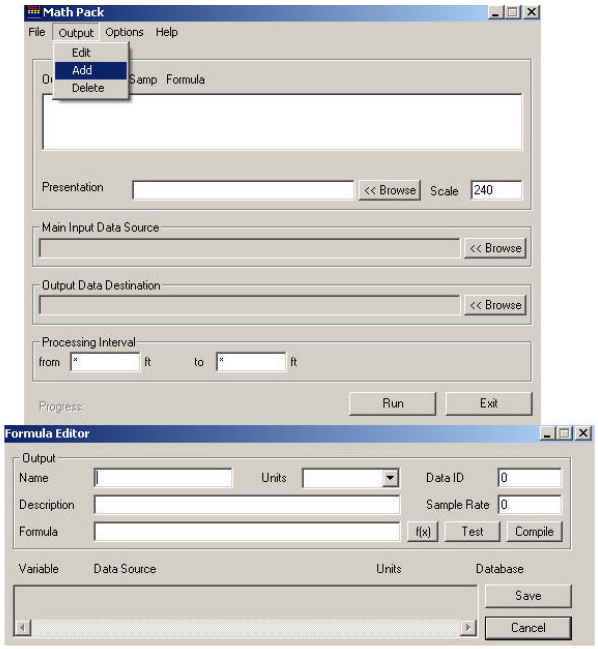


FIG: 15.5 Output /Add

15.2.1 Output Units
If an input variable has units selected as "None", then the units for that variable will come from the database, otherwise the selected units will be used. If the units for the output or input are "None", then no unit conversion will be done. Otherwise, an attempt will be made to convert the value from the input units to the output units. An example may be:
CalAvg = (Cal1 + Cal2) / 2
CalAvg units may be inches, Cal1 units may be mm, Cal2 units may be cm.
Cal1 and Cal2 will be converted to inches before they are added together.

15.2.2 Output Box
The output box shows the output name, output sample interval, and the formula used to create the output. If the output sample interval is 0, then it will be calculated when the Run button is selected.
The calculated output interval will be the maximum of the intervals of the input curves. Any zoned variables will be sampled at a rate of 600.

15.2.3 Presentation / Scale
The presentation file and scale to be used when creating a new pass. If the data is going to an existing pass, then the existing presentation and scale will be used.

15.2.4 Main Input Data Source
Will overwrite any data sources that were selected for particular curves. Will default data source for each formula variable to: field/well/run/pass/[variable name]/*
At runtime, if it cannot locate field/well/run/pass/[variable name]/* then it will try to locate it as a zoned variable: field/well/run/pass/_vars_/[variable name]
If that cannot be located, then a warning message will appear "Unable to connect to input [variable name] in [database]:[pass]"
If the Output Data Destination is blank when this is selected, then a default new database name will be created. The new name will be: field/well/run/mpk_[x] where x increments for each math pack run.

15.2.5 Output Data Destination
This can be created automatically by selecting the Main Input Data Source first. This can be an existing database if the created curves do not exist already. If the created curves exist then the following message will appear: "Unable to create output [database]:[pass]/[variable name]/1"
If you select Generate Report from the Options menu, then the destination will be the location of the embedded text report.

15.2.6 Processing Interval
To process the entire input interval, leave **FROM** and **TO** values as "*".

15.3 Formula Editor

15.3.1 DataID
A value used for Warrior databases. Default is 0.

15.3.2 Description
This will be written to the output database along with the output name.

15.3.3 Formula
To see what functions are available, select the **"f(x)"** button. This will also show what parameters are needed for each function. There is a different set of formulas for the Report output and for the Curve output. The AVG curve formula will create a new curve which will be the average of one or more curves - i.e. AVG(GR1, GR2, GR3). The AVERAGE Report will create the average value of the

curve(s) over the entire interval. The MIN, and MAX functions are similar to the AVG function, and the MINIMUM and MAXIMUM functions work like the AVERAGE function.

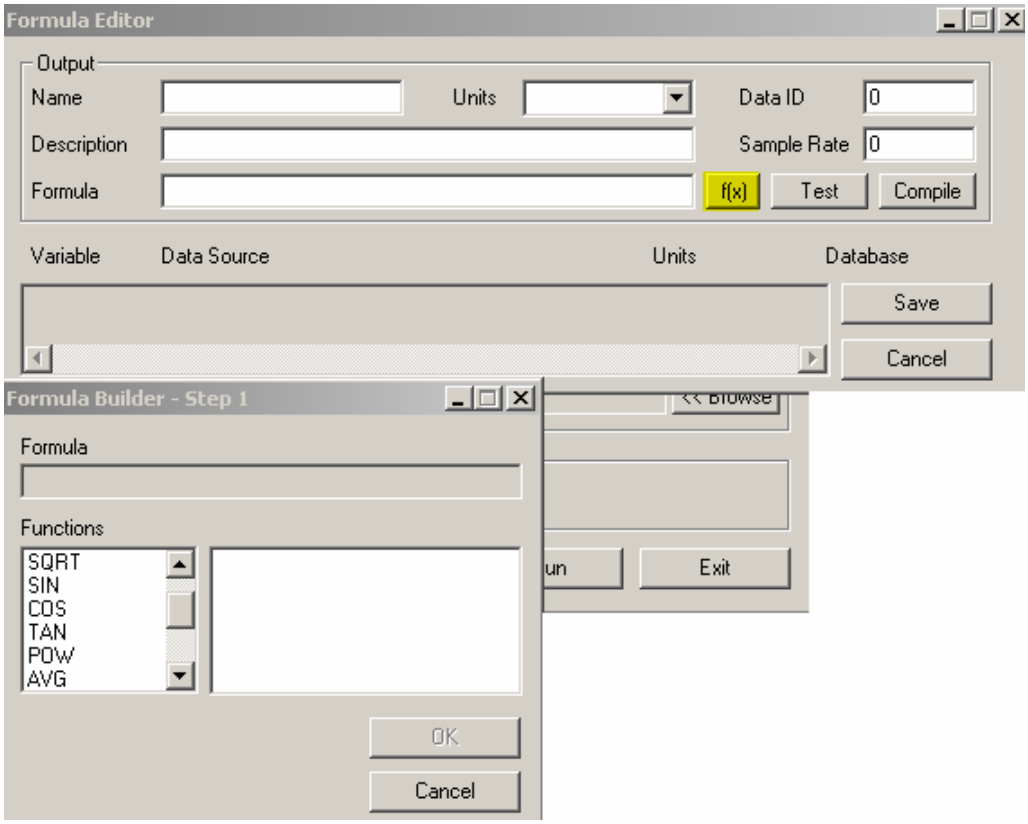


FIG: 15.6 Formula Editor

15.3.4 Test

This will run sample values through the formula and show the result. It will automatically fill the variables with values starting with 1 and incrementing for each variable. You can also test the formula with other values by placing a number in the Data Source box next to the variable name.

15.3.5 Compile

This will determine if the created formula will be able to compute a value. The Formula Editor window will change after the compile to show the new variable list.

15.3.6 Data Source

Select the Curve button to select a curve from a dataset. Select the Var button to select a zoned variable from a dataset. This will be the source of the data for each variable. This will also be filled in if the Main Input Data Source from the Main Window is selected.

15.3.7 Variable Units

To override the units from the database, change this setting; otherwise leave it "None". Also see output units.

15.4 Options

The Math Pack program will generate two types of outputs - curves and reports. The curve output will create another log pass with the output curves generated by applying the formula at each data point. A report output will generate an embedded text report, which will contain the results of the formula(s)

applied to all of the data points over the entire interval. The output data destination will be the location of the embedded text file in the database.

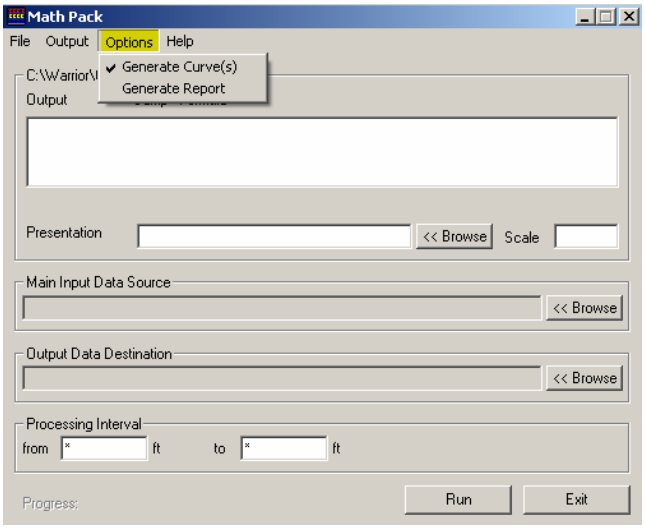


FIG: 15.7 Options

15.5 Demo example

Create a new Math Pack Job (demo), Add new output curve (GRADD), Select GR curve from DB CBLDEMO, ADD 200 API, and plot.

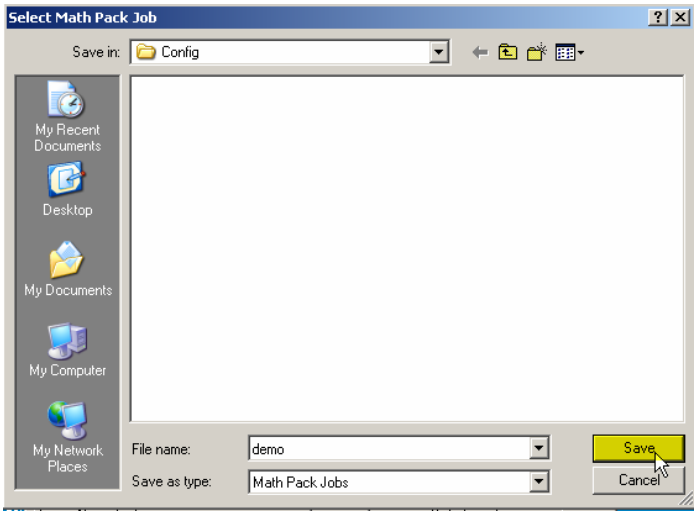


FIG: 15.8 New Job Math Pack

Type new Math Pack job “demo’

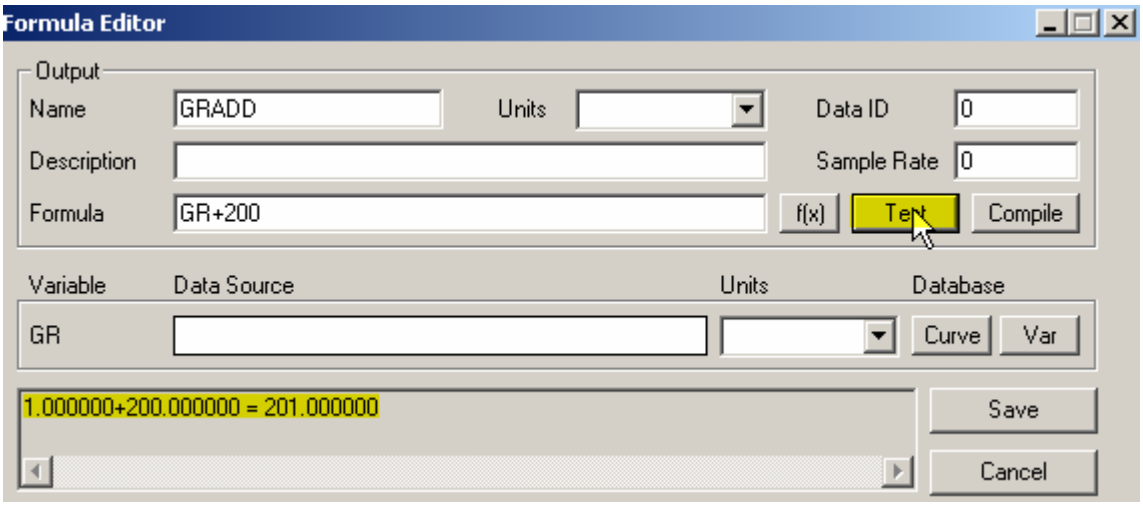


FIG: 15.9 Formula Editor Setup

ADD or create a formula, either select **Output/Add** from the main menu, or press the Insert key
Type on Name box “GRADD”
Type on description box “Gamma Ray ADD “
Type the formula GR+200
Type the formula and click on **Test**
Click on **Save**

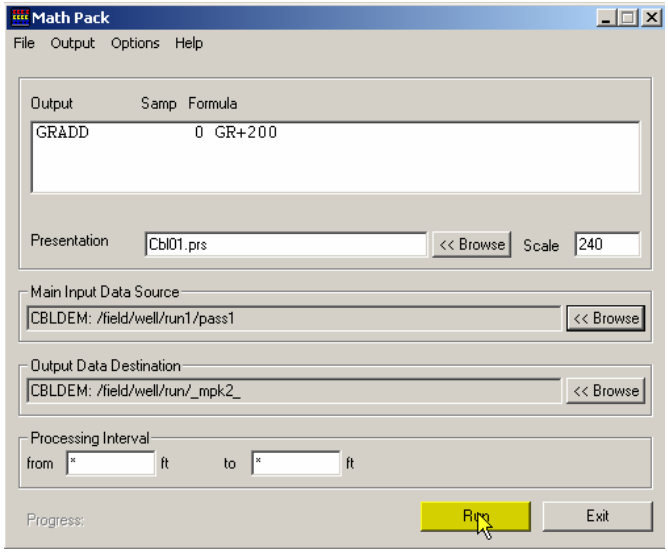


FIG: 15.10 Run Math Pack

Select Main input data source from the warrior Data Base (CBLDEMO)
The Output Data Destination can be created automatically by selecting the Main Input Data Source first.
Click on **Run**

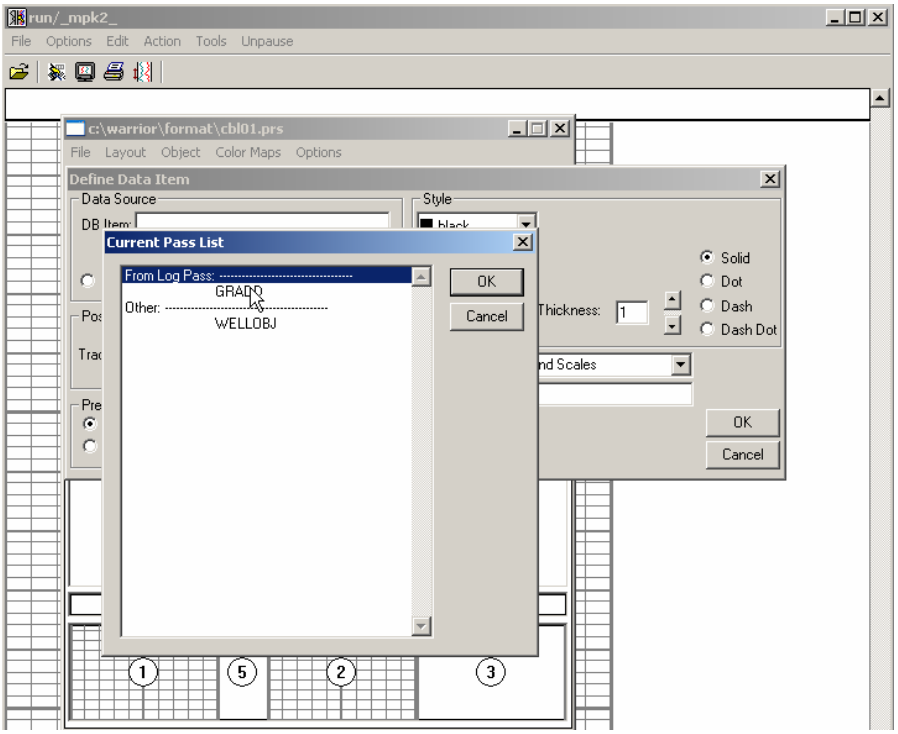


FIG: 15.11 Select New Curve

Add a new curve GRADD

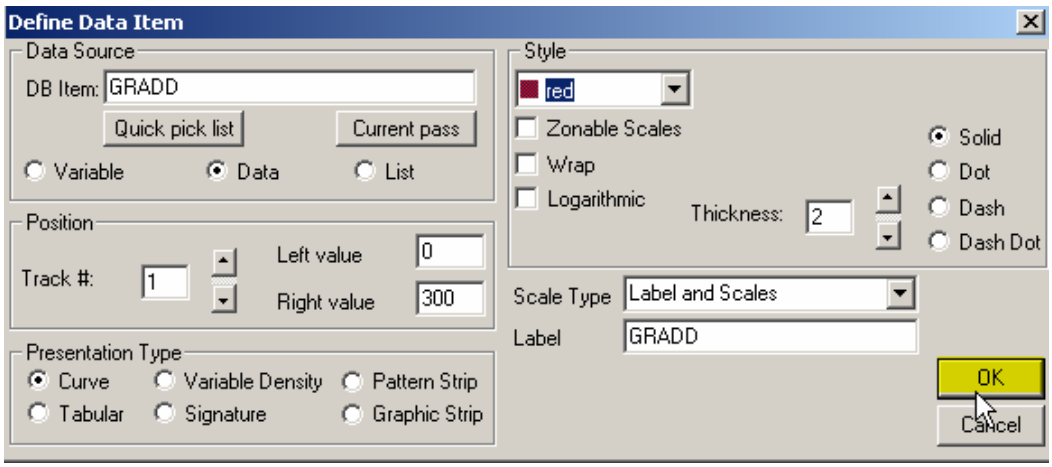


FIG: 15.12 Set Curve

Set Scales and Track values

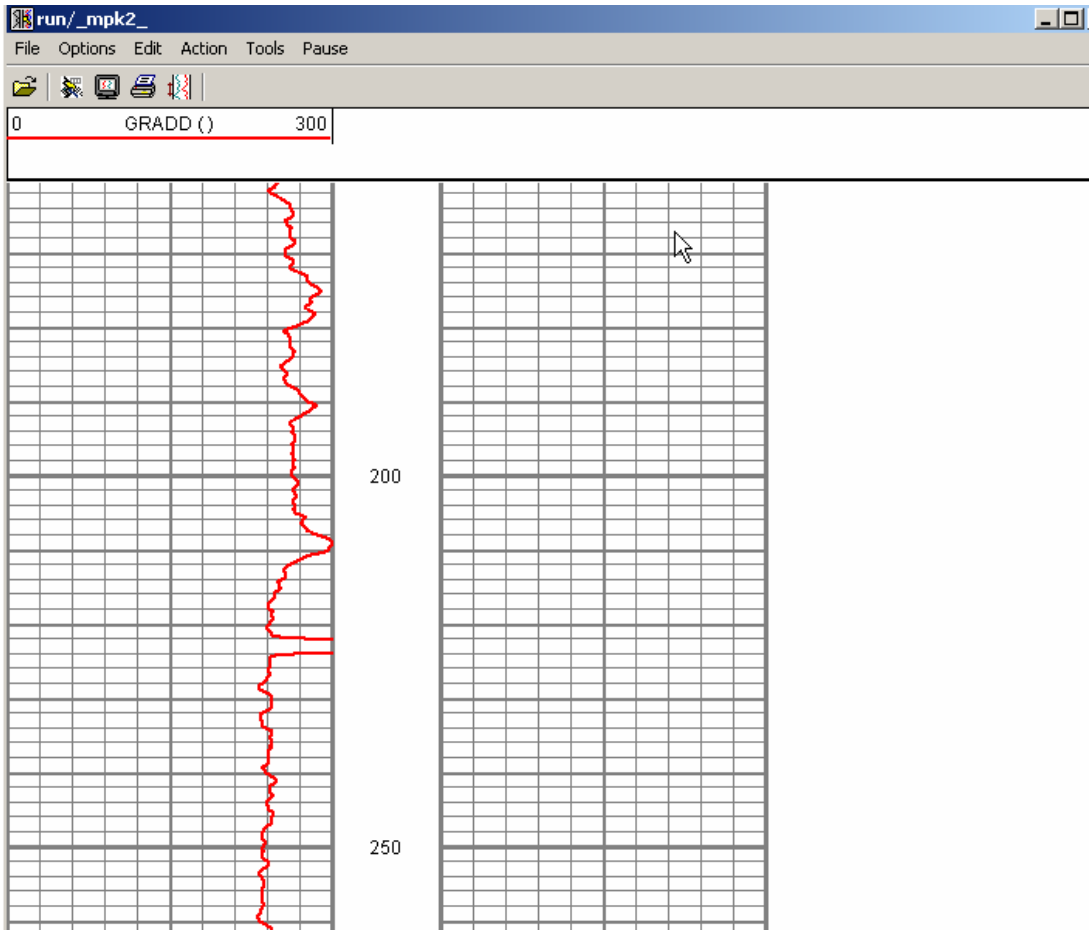


FIG: 15.13 Plot Curve

Plot the Curve GRADD

VIDEO: 15.1 Math Pack

Section

16

16 Simulator Box

The USB Simulator connects to the USB port of the system pc and receives 5-volt power up to 500ma from it. Tool waveforms can be downloaded and then played back in analog form through the line or directly into the system. Outputs to test the Depth Encoder and Tension are also provided.

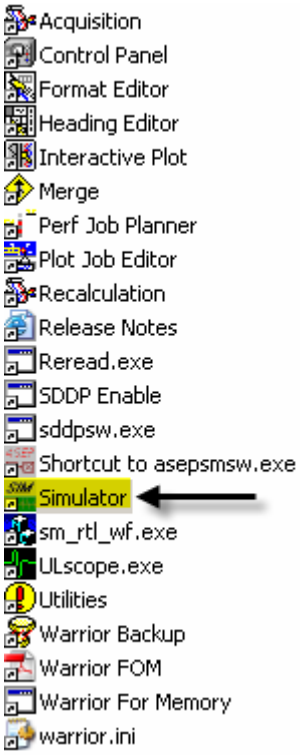


FIG: 16.1 Simulator

When the USB Simulator is powered up by plugging it into the USB port of a PC or the USB HUB of a Warrior Interface panel, it goes through a two-step enumeration according to the device code found on EPROM IC5. Double clicking the SIMULATOR icon in the Warrior panel will bring up the control window.

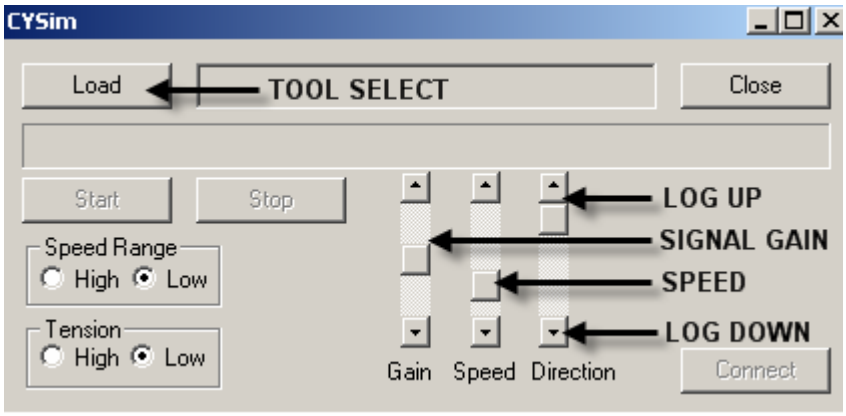


FIG: 16.2 Simulator Controls

Select LOAD and choose the tool waveform from a list. These files are located in the Warrior Bin directory.

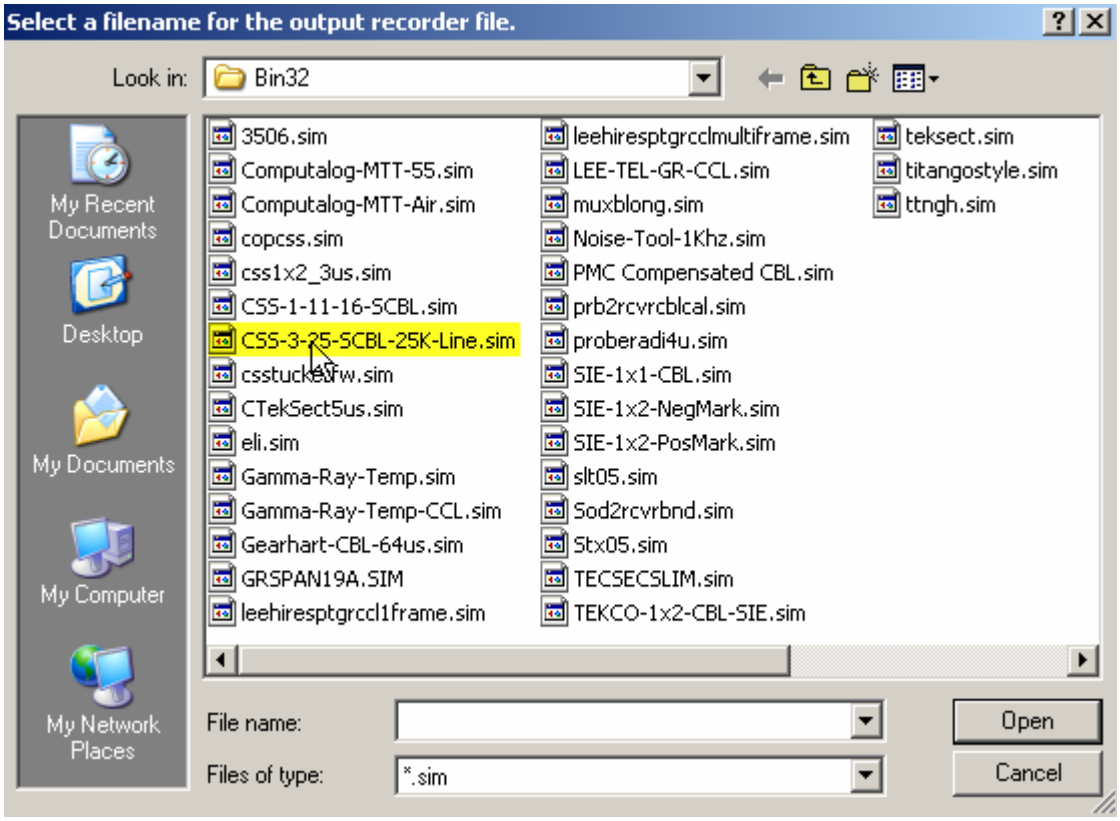


FIG: 16.3 Simulator tool files

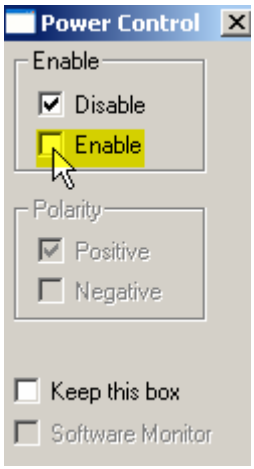
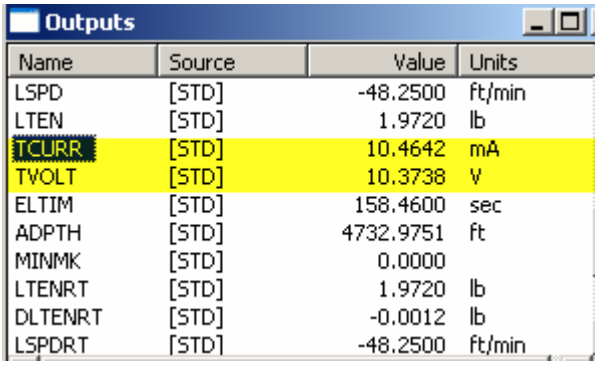


FIG: 16.4 Power Control



Name	Source	Value	Units
LSPD	[STD]	-48.2500	ft/min
LTEN	[STD]	1.9720	lb
TCURR	[STD]	10.4642	mA
TVOLT	[STD]	10.3738	V
ELTIM	[STD]	158.4600	sec
ADPTH	[STD]	4732.9751	ft
MINMK	[STD]	0.0000	
LTENRT	[STD]	1.9720	lb
DLTENRT	[STD]	-0.0012	lb
LSPDRT	[STD]	-48.2500	ft/min

FIG: 16.5 Outputs

To playback the waveforms press the START button.
There are slides for Encoder Speed and Output Gain. The Encoder speed will depend on what number is input for pulses/foot. 120 should give a reasonable range. If less speed is needed change the number to 600 pulses per foot. There is a button for high and long range. Low range will provide speeds less than 100 feet per minute. There is a button for changing the direction, up/down.
The Depth Encoder power from the interface panel lights an LED or both if it is twelve volts.

16.1 Circuit Description

The simulator gets its intelligence from IC1 – a Cypress AN2131Q EZ-USB controller with 8k of internal ram. An external 128k x 8 static ram, IC2 - CY71019B – is used to store waveform data. IC5 - 24LC00P, EPROM is used to store the USB address code so the device enumerates as a Simulator and not as something else.
IC6 provides 3.3 volts for most of the logic from the USB 5 volt supply. A DC-DC Converter supplies +/- 12 volts from the 5 volts supplied by the USB port. An external 5-volt supply can be used if it is needed.
The encoder frequency is set by OUT0 from DAC, MAX519. The DAC output goes to a voltage divider to reduce the 0 to 5 volt swing to 0 to 1 volt for the V to F converter, IC10, AD654. Software controls the high and low range of the encoder speed. The output frequency goes to IC9B, buffer, and then is split and one side inverted. One side goes to IC12A, and the other to IC12B, SN74LS74, dual D flip flop. These are wired to give two wave trains 90 degrees apart. The A signal goes to Encoder Out A. The B side goes to IC9A where PA5 sets direction. When PA5 is changed the output of IC9A will be inverted. That is how UP/DOWN is controlled. The signal then goes to

Encoder Out B. IC7 and IC8 test the ENCODER voltage, lighting one led if it is five volts, or both leds if it is twelve volts. The encoder pulses are derived from the supply voltage. A 5 volt supply produces 5 volt pulses and a 12 volt supply produces 12 volt pulses.
SDA and SCL from IC1 control the DAC. IC4 address lines: 01000000 address byte.
PA6 controls IC14, DG411, switch. It connects R32 for 20ma and disconnects it for 2ma. The 12 volts from the STIP is converted to a current by IC7, LM317 to furnish the output signal. The circuit will accept a 24 input also.
The data loaded into the ram, IC2, is sent to the DAC a byte at a time and reproduces whatever waveform has been recorded. The chip enable comes off A15 to allow memory paging. It is inverted. Write enable and out enable are active low. A15 is used because we are only interested in high addresses. A16 comes from PC1/TXDO. R36 was added to shift the DC offset of the DAC to zero. The signal is sent from the DAC to U2A, TL082P, op amp, and then to U3, AD633, and voltage multiplier, through a 1K resistor. The multiplier voltage is supplied by IC4, serial DAC, and OUT1, which set the output gain. The signal then goes to U2B and IC3, BUF634, op amps to the line out connector.
Cable to Encoder and Line Weight:

16.2 SIMULATOR Hookups

5 PIN MALE - Tension ----------Interface Panel

A – TENSION SIGNAL GROUND REF ----------A
B – TENSION SIGNAL OUT ----------B
C – Tied to E ----------C
D – +12 VOLTS IN----------D
E – GROUND ----------E

7 PIN MALE – Depth Encoder

A – ENCODER-A
B – ENCODER-B
C – N/C
D – ENCODER POWER IN
E - GROUND

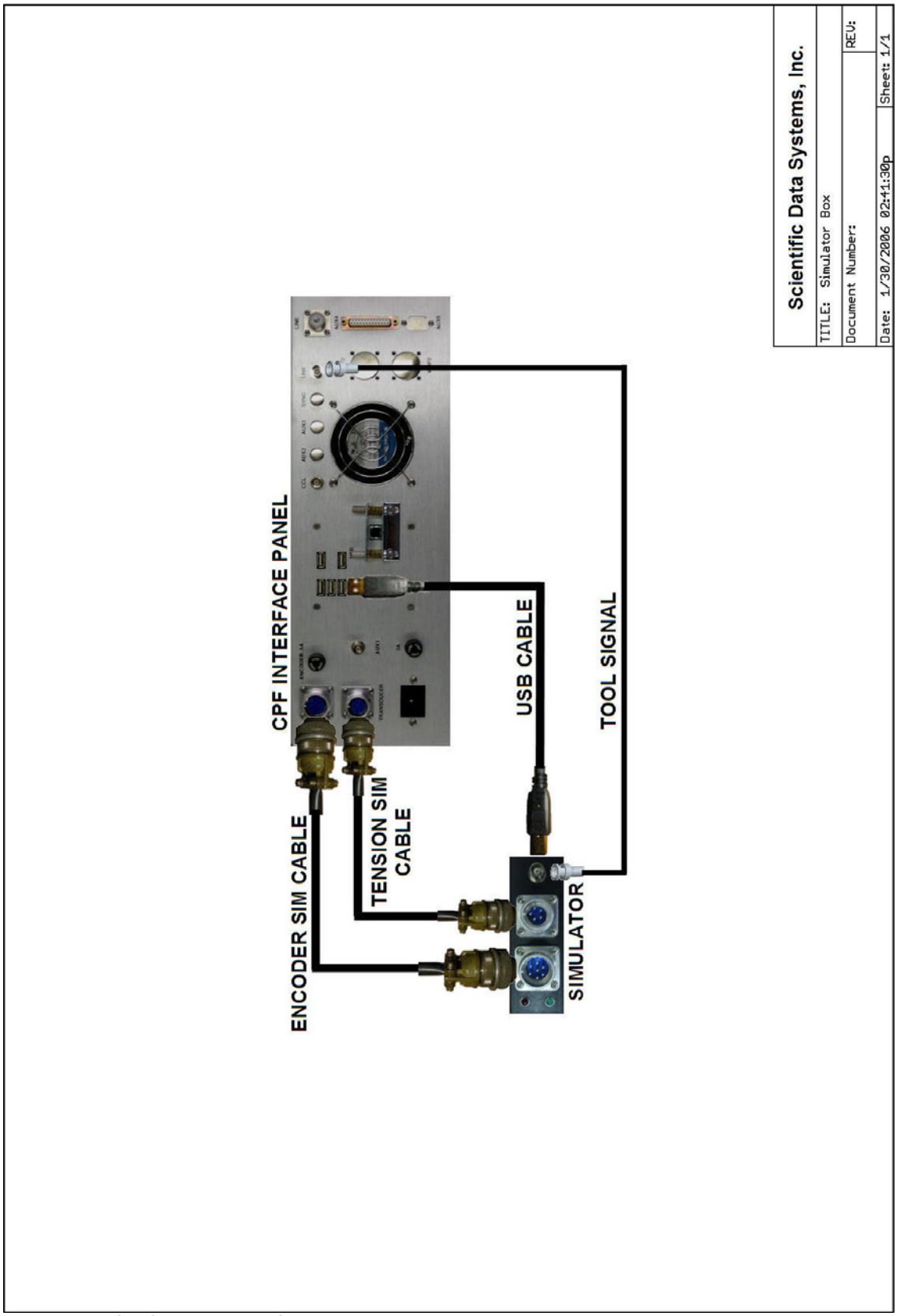


FIG: 16.6 Simulator Box Hookups

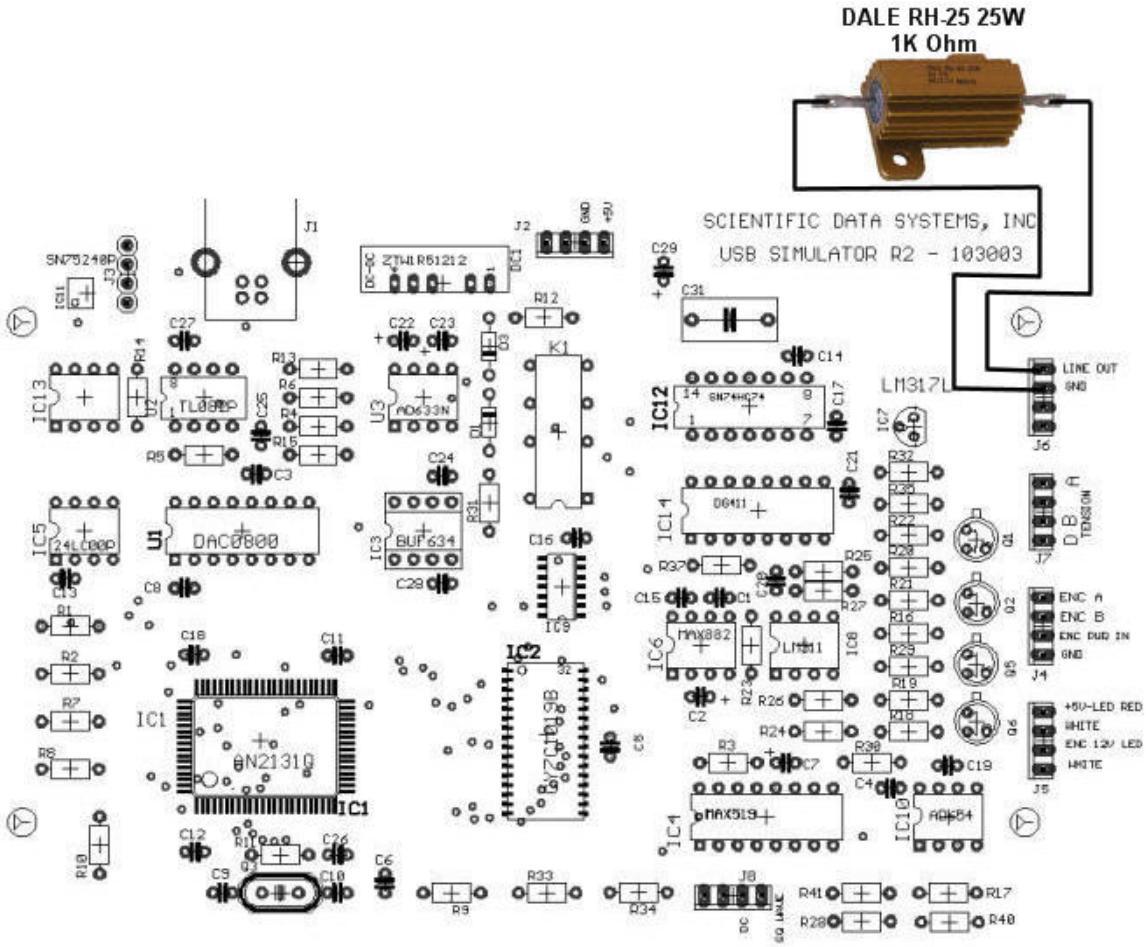


FIG: 16.7 USB SIM R2 board layouts

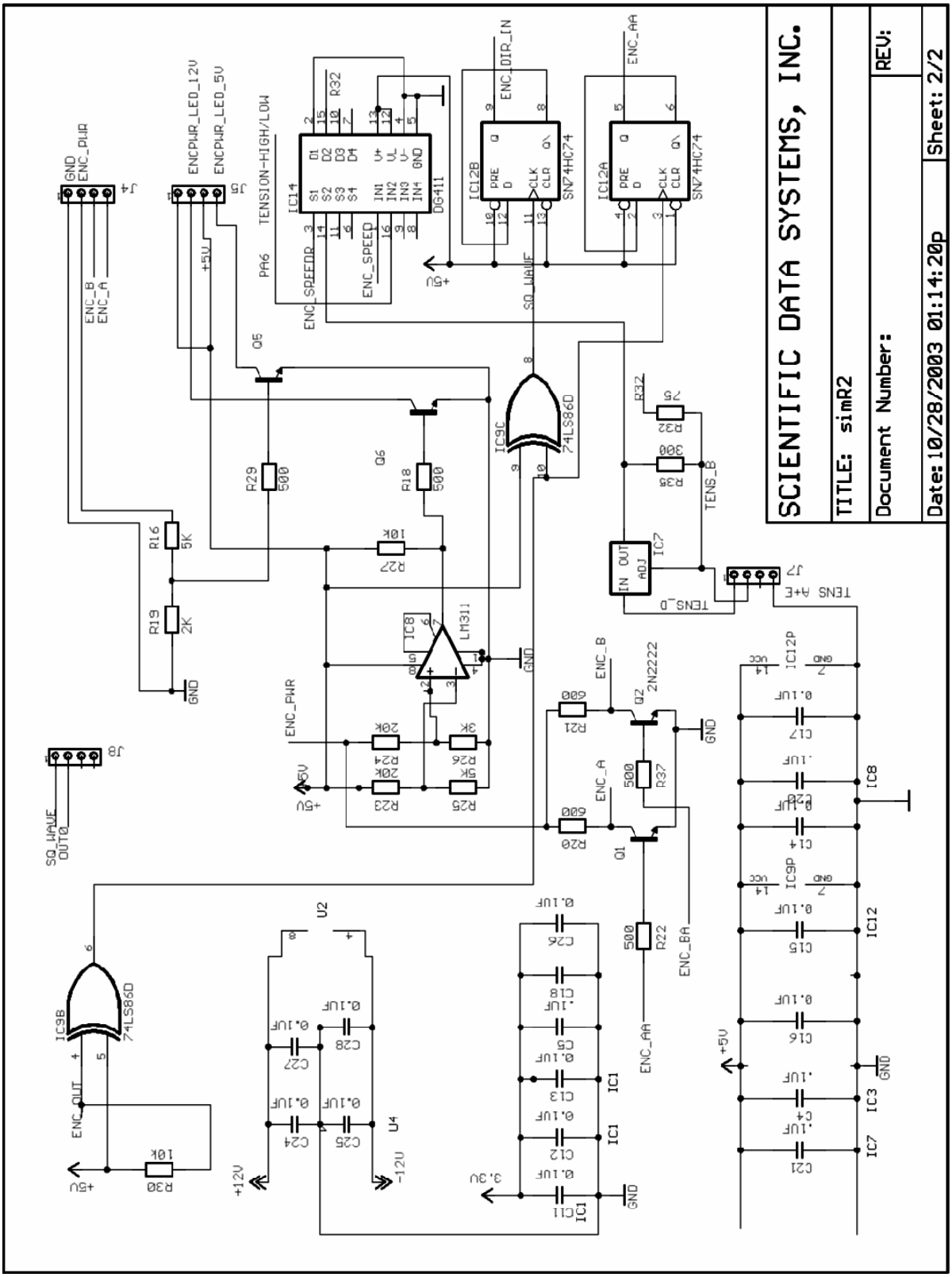


FIG: 16.8 USB SIM R2 Schematic

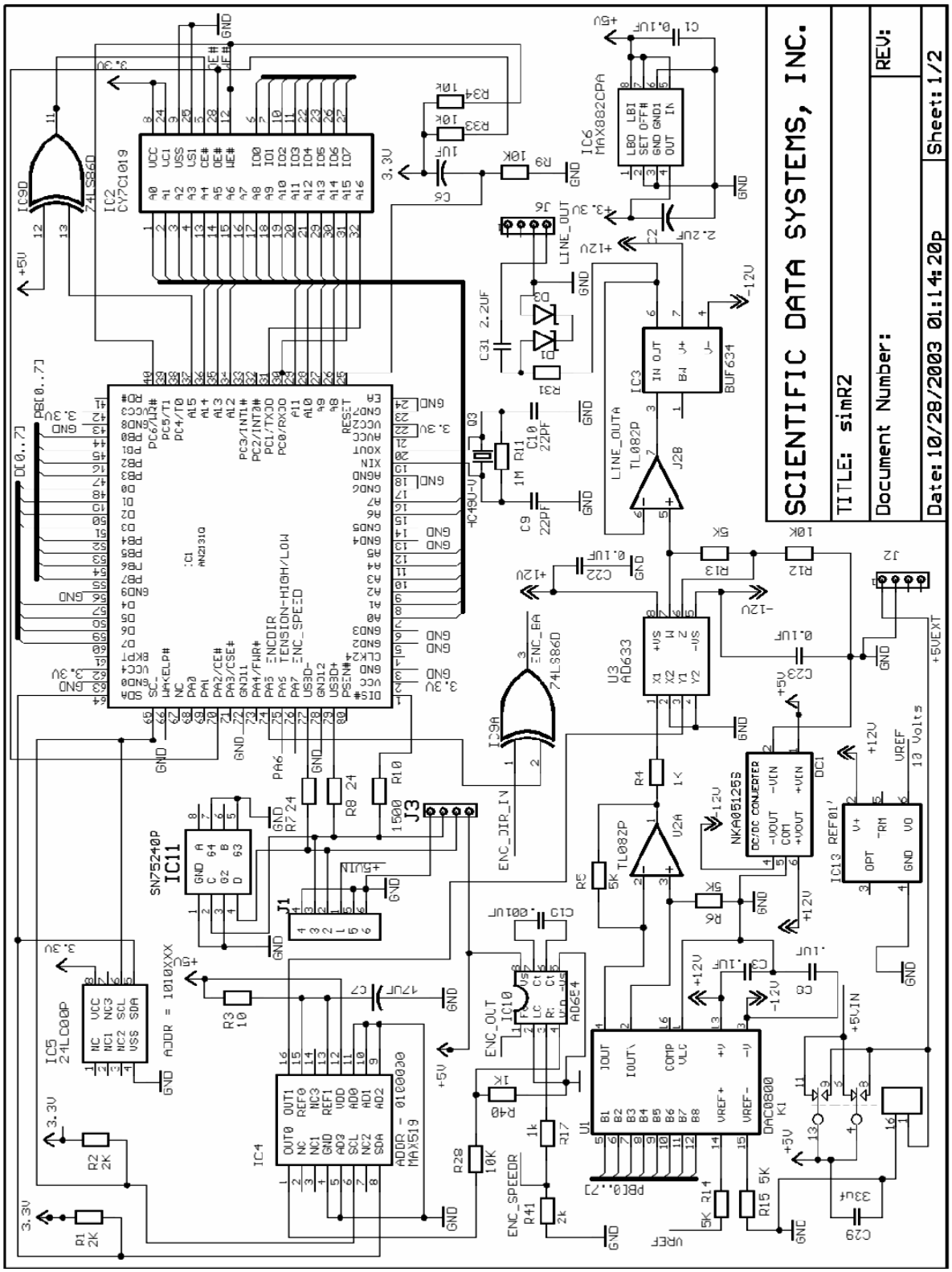


FIG: 16.9 USB SIM R2 Schematic

Section 17

17 Recorder

17.1 Warrior Line Signal Recorder Service

With the Recorder service, it is possible to make a recording of the line signal with minimal filtering. The recording can then be used to make a Simulator file to play back into the system through the Scientific Data Systems Simulator Box. Or the recorded file can be sent to Scientific Data Systems to check the tool telemetry or set up a new service for the tool telemetry. The recorder service is not normally installed as one of the default services. The service can be imported through the Service Editor.

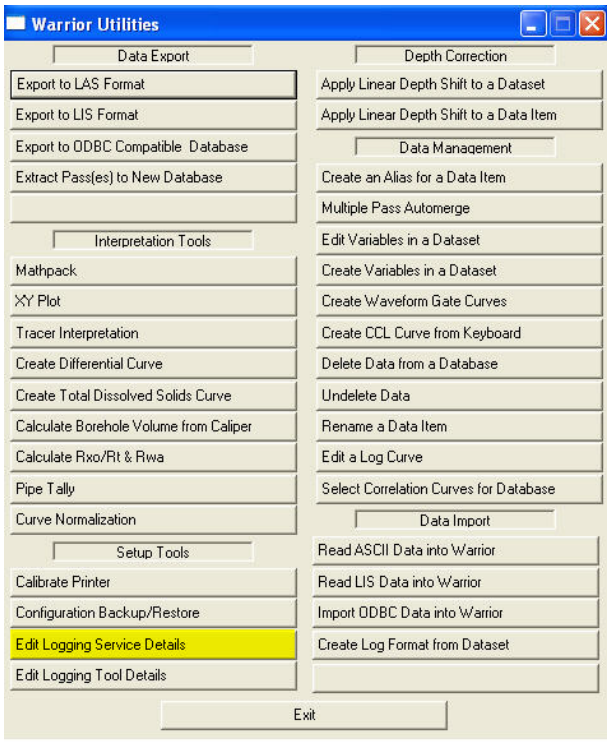


FIG: 17.1 Select Edit logging Details

To install the Service Editor, go to Warrior Utilities and click on [Edit Logging Service Details]. To Import the Recorder Service, Click on Service ->Import. From the Warrior\Config folder, choose the CH USB 70.WSV file and click the [Open] button. From the service import list, choose the Recorderservice. It will then be added as the last service in your active service list. The Service Editor and Utilities can now be closed. If Acquisition is open, it will have to be closed and then reopened before the Recorder service will be available.

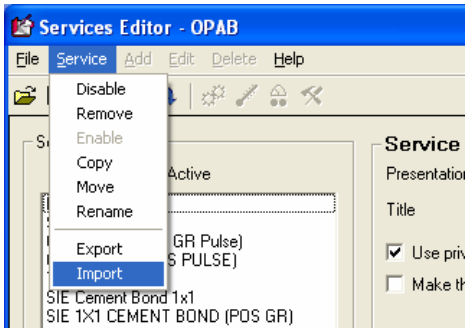


FIG: 17.2 Service\Import

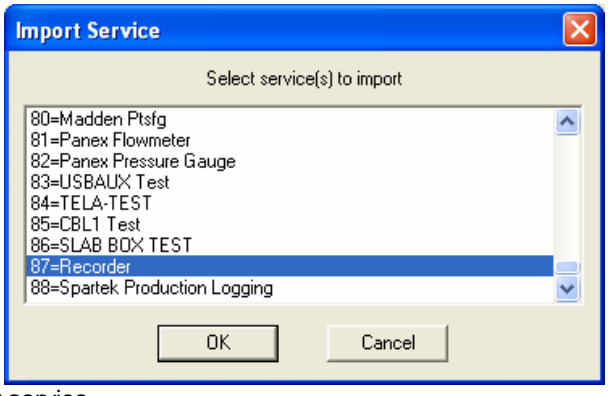


FIG: 17.3 Import Recorder service

To make a line recording, start Acquisition and select Service -> Recorder. When the Tool String editor comes up, click [Save] or [Exit], there are no tools to select or edit. In the Acquisition window click on Action -> Power Control and enable the line in the normal manner. Adjust tool power for proper operating voltage and current for the tool that you are using. The Recorder Threshold window will show a sample of the signal that will be recorded. No adjustments are necessary in the Recorder Threshold window.

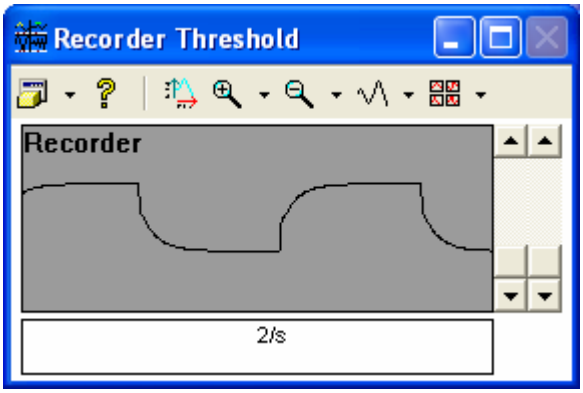


FIG: 17.4 Recorder

FIG: 17.5 Set up Signal Recorder

There are two other windows that come up when the Recorder service is started. These are the Panel Controls window and the Signal Recorder Setup window. The Panels Controls are not normally used unless the default Input Channel is changed from 15 to a channel that corresponds to the Sync, Aux, or Sonic input channels. This will be discussed further later.
There are 4 settings in the Signal Recorder Setup window that can be adjusted. If any of these settings are changed, the [Apply Settings] button must be clicked before the recording is done, otherwise the original settings are used.
The Input Channel is the selected DSP input channel (0 to 15). These channels are hard wired within the Warrior Interface Panel. Channel 15 comes from the ANASW board. The signal has been capacitive decoupled from the line and ran through a buffer. It is as true a raw signal as the system can digitize.
The Sample Rate is how often the DSP will digitize the incoming signal. A 5us rate is appropriate for most recordings. It should not be set to lower than 3us.
Signals may be attenuated on the DSP before they are digitized. Before doing a recording, the Attenuation setting should be adjusted to maximize the signal in the Recorder Threshold Window. The signal should not go to the top or the bottom of the window. The smaller the Attenuation setting value, the larger the signal will be. An Attenuation of 100 will not show any signal and will not give a usable recording.
The record time is the number of seconds that the signal is recorded.
When settings have been adjusted as needed and the [Apply Settings] button has been set, the next step is to click the [Record] Button. You will need to select a file name to save the file. It is recommended that the file extension show the sample rate so that the file can be played back at the appropriate rate to give a valid recording such as 5us for a 5-microsecond sample rate. Once the [Save] button is clicked, the recording will start and continue for the number of seconds set in the Record Time setting. The Record Time will count down showing the number of seconds left to record until the recording is complete.

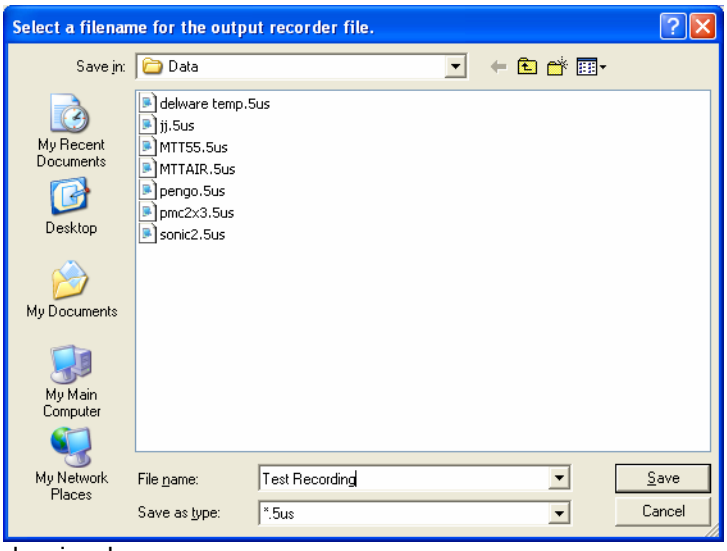


FIG: 17.6 Save the Recorder signal

The following is a list of the Hard Wired DSP channels in the SDS Interface Panel.

Input Channel	Signal	Note
0	Sonic Amplitude	Configurable Filter
2	Audio X10	
3	Audio X1	
4	Sync / Pulse	Configurable Filter
5	Audio X.1	
6	Audio X.01	
8	AUX	Configurable Filter
15	ANASW Signal	Recorder Default

17.2 Converting Recordings to SDS Simulator Box Files

The recording must first be converted from a DSP recording to a WAV file and then the file must be edited to fit a format needed by the simulator box.
In Warrior\Bin32 is SIMConvert.exe that will read in a recording and write a WAV file. Click on the [Load Oscope File] button to select the DSP recording. After loading the file and before writing the 8 Bit Wave file, be sure that the sample period matches the sample rate done during the recording. For simple recordings, the difference in the Start Sample and Stop Sample should be less than 128000, since this is the maximum number of samples the Simulator box can hold. Click the [Write 8 bit Wave] button to write the file. If this is a simple file, it can be saved with a .SIM extension and used directly by the Simulator Box.

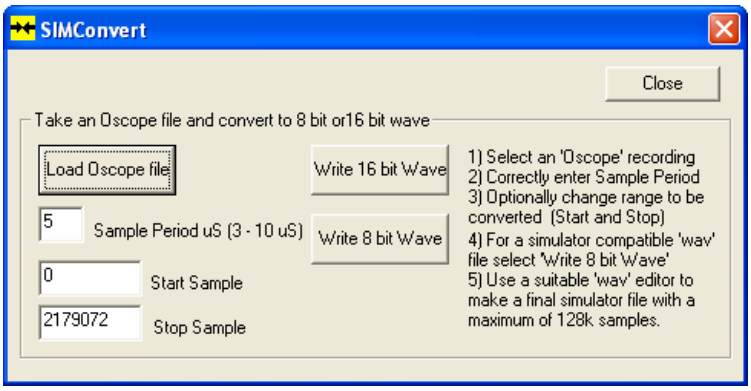


FIG: 17.7 SIM convert

FIG: 17.8 Open

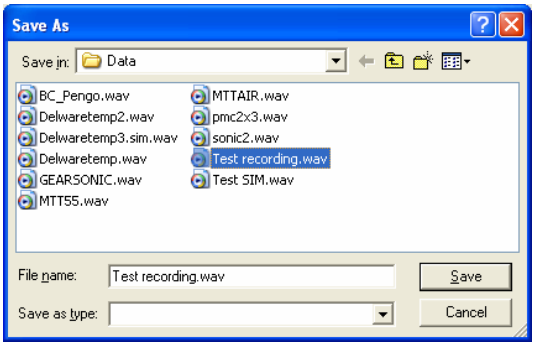


FIG: 17.9 Save As

With more complex recordings, it may be necessary to use a Wave Editor to view and modify the recording before converting it to a simulator file. The Warrior software does not include a waveform editor, but there are many free editors available through the Internet. The following Internet link is a down load for a very versatile editor - http://www.yamahasynth.com/download/twe.html.
If the signal being recorded has a periodic rate, the waveform should be edited to start before a given point in the period of the signal and to end before the same point at a number of cycles later in time and keep below the 128,000-sample limit of the Simulator Box. The waveform editor could also be used to adjust the amplitude of the recording or insert or enhance features in the recording, such as gamma pulses in a bond tool recording.

Section
18

18 Multi-Arm Caliper

This program will read in LAS data from a Multi-Arm service and create a single pass in a Warrior database. This pass will not only contain the curves found in the LAS data, but will also create a 180 point VDL curve by interpolating between each of the Multi-Arm caliper readings. This program also contains a viewer that can display a 3 dimensional view of a section of the Multi-Arm data.
The first step is to import the Multi-Arm data in to a Warrior database. Use the build button (…) to select the LAS file to import.
Color maps are used by the Multi-Arm program and by Iplot to create the range of colors used to draw the diagrams. To have the color of the VDL in Iplot match the Multi-Arm plot, have them use the same color map. To make the VDL plot match, use the Minimal value for the VDL black level, and the Casing OD value for the VDL white level.
In warrior.ini go to the section [Color Maps]. Once you have run the Multi-Arm program at least once, there should be an entry called MultiArm.

[Color Maps]
1=GrayScales
2=Sectors
3=Colors01
4=MultiArm

In the [Screen] section there should be an entry like this
MultiArm=69,{96,0,0},{112,0,0},{128,0,0}, etc.
From Iplot, plot the SIG curve as a Variable Density presentation type, and select Multi-Arm for the Color Map. Scale from 0 to 180 to see all the points. Now the color of the 3-D plot should match the VDL. For the hardcopy to match, you also need an entry under the section with your printer name like the one in the [Screen] section.
To change the color map used for the XY plot, go to Multi-Arm Plot Options, select the color map you want to use from the list of color maps, and select the Load button. Any future plots will default to the plot option you have selected.
You can make your own color maps from the Warrior Log Format Editor. Select “Color Maps -> Edit” from the main window

18.1 Caliper Presentation

The presentation file will be embedded in the database as the presentation to be used when the data is plotted. This can be edited later.
Edit the warrior.ini with your NotePad (copy and Paste)
Add under [Color Maps] spectrum

```
[Color Maps]
1=GrayScales
2=Sectors
3=Colors01
4=Colors02
5=Colors03
6=Pipe Grade
7=CATVDL
8=MITVDL
9=MITREV
10=MultiArm
11=spectrum
```

Open with NotePad the file Color Map and copy and paste in Warrior.init
Add in warrior.ini

Spectrum=253,{204,51,51},{205,50,50},{207,48,48},{208,47,47},{210,45,45},{211,44,44},{213,42,42},{214,41,41},{216,39,39},{217,38,38},{219,36,36},{220,35,35},{221,34,34},{223,32,32},{224,31,31},{226,29,29},{227,28,28},{229,26,26},{230,25,25},{232,23,23},{233,22,22},{235,20,20},{236,19,19},{238,17,17},{239,16,16},{240,15,15},{242,13,13},{243,12,12},{245,10,10},{246,9,9},{248,7,7},{249,6,6},{251,4,4},{252,3,3},{254,1,1},{255,0,0},{255,0,0},{255,7,0},{255,15,0},{255,22,0},{255,29,0},{255,36,0},{255,44,0},{255,51,0},{255,58,0},{255,66,0},{255,73,0},{255,80,0},{255,87,0},{255,95,0},{255,102,0},{255,109,0},{255,117,0},{255,124,0},{255,131,0},{255,138,0},{255,146,0},{255,153,0},{255,160,0},{255,168,0},{255,175,0},{255,182,0},{255,189,0},{255,197,0},{255,204,0},{255,211,0},{255,219,0},{255,226,0},{255,233,0},{255,240,0},{255,248,0},{255,255,0},{255,255,0},{248,255,0},{240,255,0},{233,255,0},{226,255,0},{219,255,0},{211,255,0},{204,255,0},{197,255,0},{189,255,0},{182,255,0},{175,255,0},{168,255,0},{160,255,0},{153,255,0},{146,255,0},{138,255,0},{131,255,0},{124,255,0},{117,255,0},{109,255,0},{102,255,0},{95,255,0},{87,255,0},{80,255,0},{73,255,0},{66,255,0},{58,255,0},{51,255,0},{44,255,0},{36,255,0},{29,255,0},{22,255,0},{15,255,0},{7,255,0},{0,255,0},{0,255,0},{0,255,7},{0,255,15},{0,255,22},{0,255,29},{0,255,36},{0,255,44},{0,255,51},{0,255,58},{0,255,66},{0,255,73},{0,255,80},{0,255,87},{0,255,95},{0,255,102},{0,255,109},{0,255,117},{0,255,124},{0,255,131},{0,255,138},{0,255,146},{0,255,153},{0,255,160},{0,255,168},{0,255,175},{0,255,182},{0,255,189},{0,255,197},{0,255,204},{0,255,211},{0,255,219},{0,255,226},{0,255,233},{0,255,240},{0,255,248},{0,255,255},{0,255,255},{0,248,255},{0,240,255},{0,233,255},{0,226,255},{0,219,255},{0,211,255},{0,204,255},{0,197,255},{0,189,255},{0,182,255},{0,175,255},{0,168,255},{0,160,255},{0,153,255},{0,146,255},{0,138,255},{0,131,255},{0,124,255},{0,117,255},{0,109,255},{0,102,255},{0,95,255},{0,87,255},{0,80,255},{0,73,255},{0,66,255},{0,58,255},{0,51,255},{0,44,255},{0,36,255},{0,29,255},{0,22,255},{0,15,255},{0,7,255},{0,0,255},{0,0,255},{7,0,255},{15,0,255},{22,0,255},{29,0,255},{36,0,255},{44,0,255},{51,0,255},{58,0,255},{66,0,255},{73,0,255},{80,0,255},{87,0,255},{95,0,255},{102,0,255},{109,0,255},{117,0,255},{124,0,255},{131,0,255},{138,0,255},{146,0,255},{153,0,255},{160,0,255},{168,0,255},{175,0,255},{182,0,255},{189,0,255},{197,0,255},{204,0,255},{211,0,255},{219,0,255},{226,0,255},{233,0,255},{240,0,255},{248,0,255},{255,0,255},{255,0,255},{251,0,251},{248,0,248},{244,0,244},{240,0,240},{237,0,237},{233,0,233},{230,0,230},{226,0,226},{222,0,222},{219,0,219},{215,0,215},{211,0,211},{208,0,208},{204,0,204},{201,0,201},{197,0,197},{193,0,193},{190,0,190},{186,0,186},{182,0,182},{179,0,179},{175,0,175},{172,0,172},{168,0,168},{164,0,164},{161,0,161},{157,0,157},{153,0,153},{150,0,150},{146,0,146},{143,0,143},{139,0,139},{135,0,135},{132,0,132},{128,0,128},{128,0,128}

Run Multiarm.exe from Warrior\Bin32 (double click over multiarm.exe file)
Select the Las File
Select The Presentation file (multiarm.prs)
Select the output database Select an existing database or type in a new database name. Fill in the field/well/run portion of the dataset. The name of the pass will always be the same as the LAS file name.
Type AM, It is mnemonic in your DB or LAS
Set the offset between calipers to show all the calipers in one track
Type the VDL output name (the name that you referrer)
If you just have LAS then select **import from LAS**. If you have the database select create **VDL**

18.2 Output curves

The program will search through the Multi-Arm LAS data for caliper curves that start with this name – i.e. ARM1, ARM2, etc. It uses these names to create the 180 point interpolation for the 3-D view. The offset between each caliper is automatically applied to the presentation file to display the individual arm data. An offset of 0 would put all of the arm curves on top of each other which may

make it difficult to see responses of individual curves. The VDL output name is the name of the curve that will contain the interpolation of the caliper data. This curve will contain 180 data points for each depth sample.

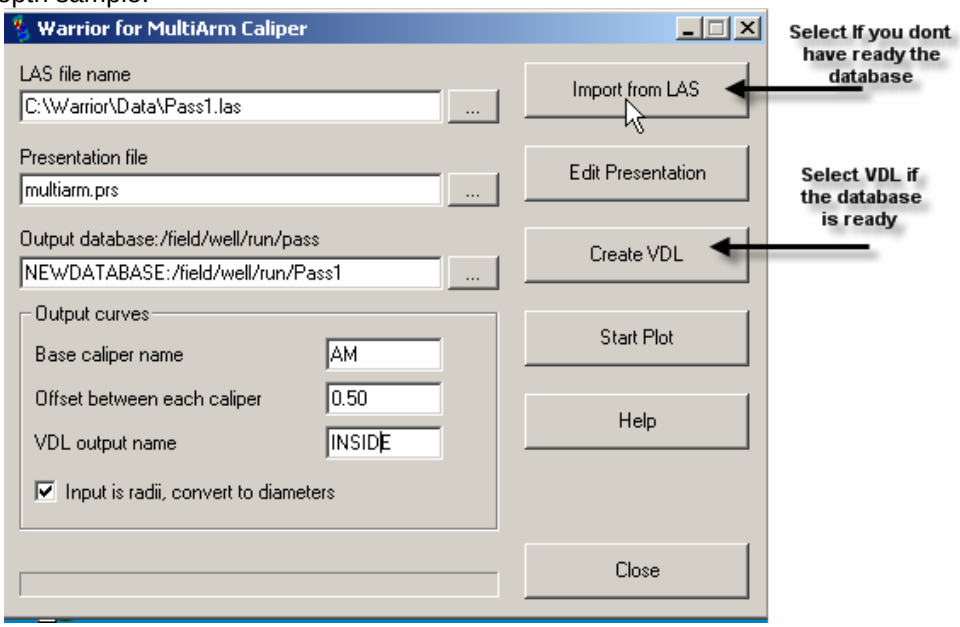


FIG: 18.1 Set up Multi-Arm Caliper

Start the process to convert the LAS to BD It takes long time for example to produce 1Gb of the DB takes close to 25 minutes.

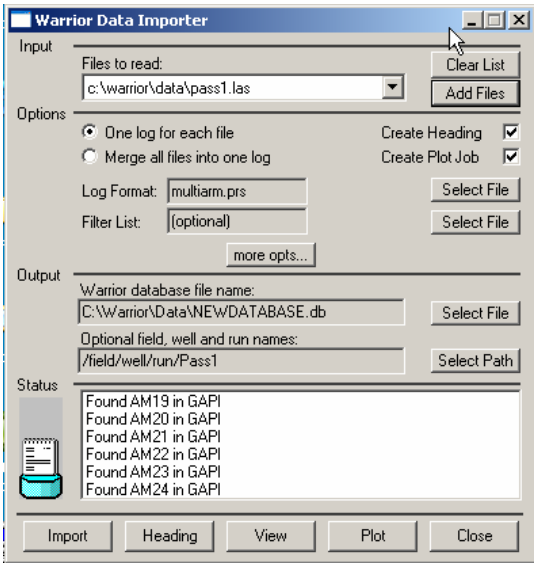


FIG: 18.2 Warrior Data Import

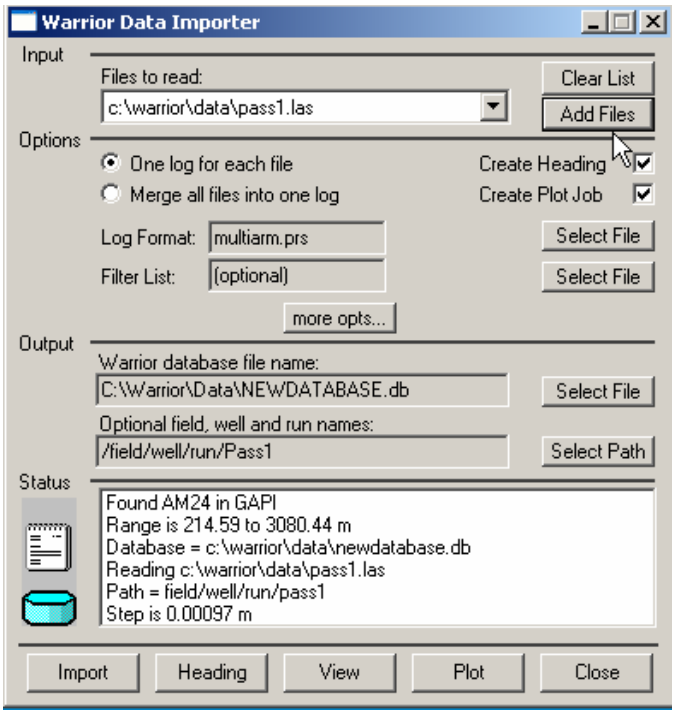


FIG: 18.3 Read LAS data

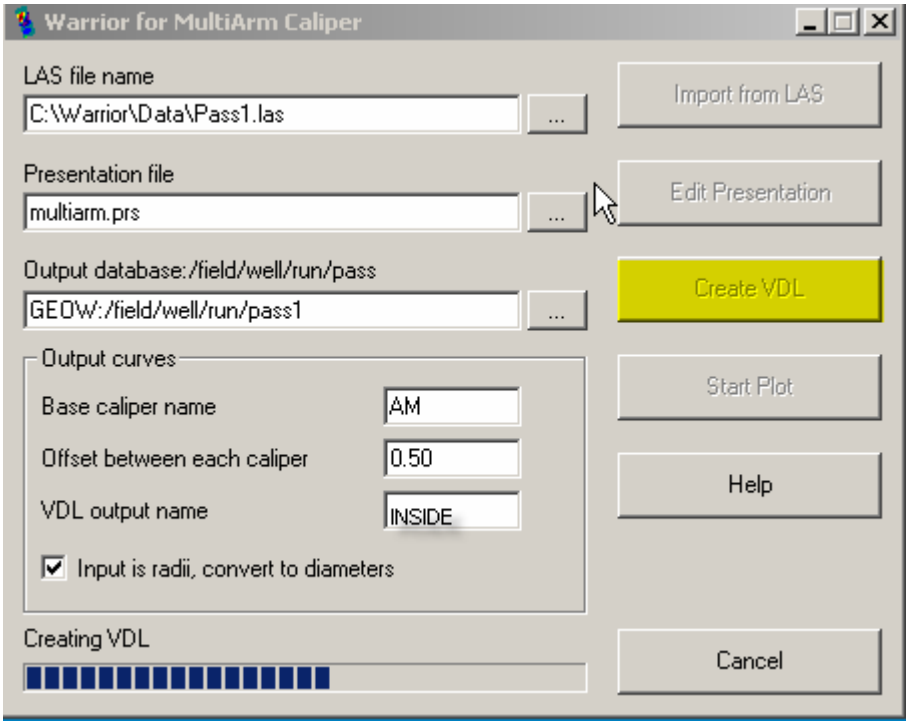


FIG: 18.4 Creating VDL

When finished the conversion Select Create VDL

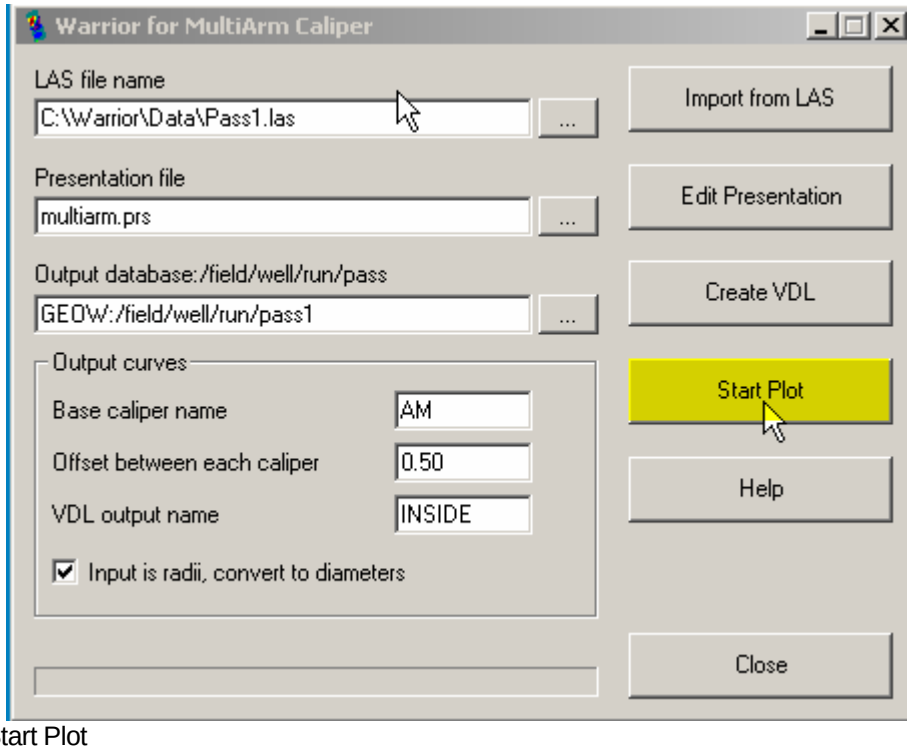


FIG: 18.5 Start Plot

Select Start plot

.

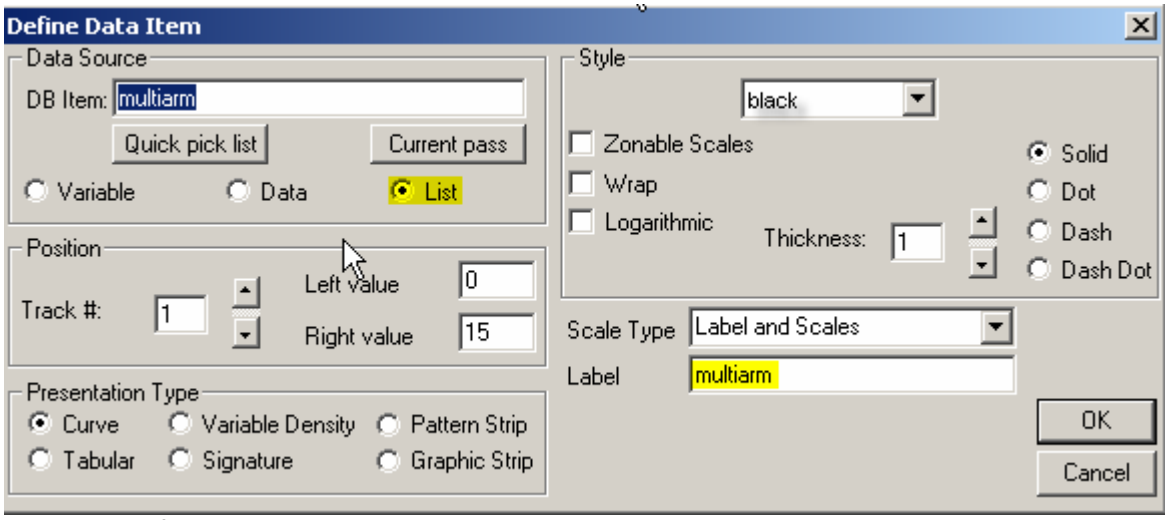


FIG: 18.6 Select Data Item

Define the parameters for DB item (multiarm)

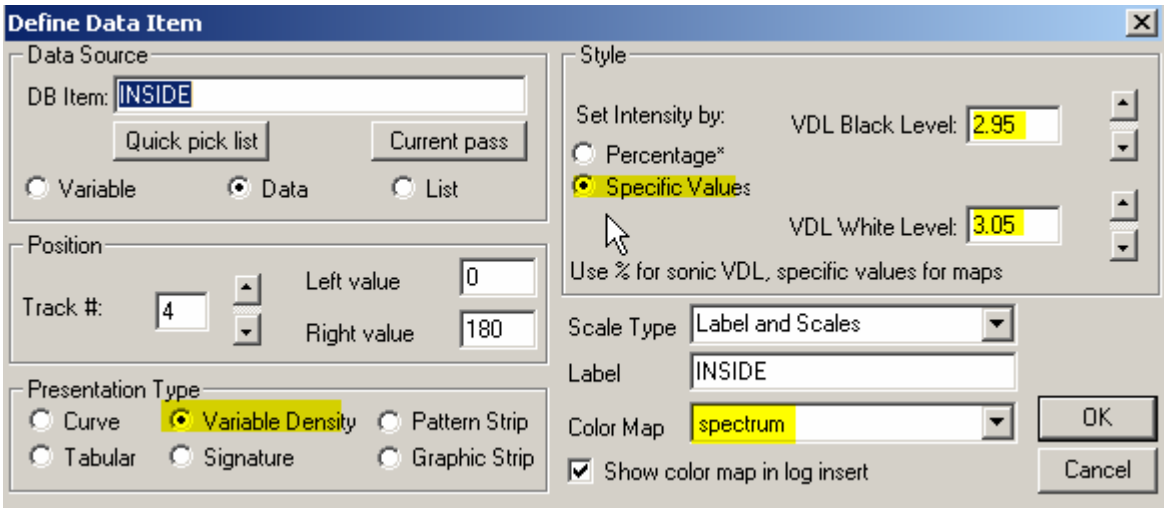


FIG: 18.7 Set presentation.

Define the parameters for DB item (INSIDE)

FIG: 18.8 Select option to set the XY plot

18.3 Edit Presentation

A pseudo-curve will be created called MULTIARM. In Warrior terms the MULTIARM curve is a “curve list”. Rather than setting up 15 curves to plot from Iplot, the MULTIARM curve contains all the information to plot those 15 curves. So from Iplot you only need to set the scale and position of the single MULTIARM curve. The color and style of each individual curve is set up with this dialog. A different offset can be applied to each curve so the activity of each caliper can be viewed much easier.

The left hand side of the Presentation dialog contains all of the curves that will make up the MULTIARM curve list during the plot. From the plot program, the scaling and location of all of these curves will be done by editing the “MULTIARM” curve. But the color, thickness, style, and offset of each curve will be set from this dialog. This information is saved in the database for that pass. Only the scaling and location of the MULTIARM curve will be saved with the presentation information.

If you select “Pick first caliper name” to choose the first caliper name from the pass you have already selected, the list of all outputs for your pass will be shown. Then you can choose the first caliper name in the list to create the Base caliper name.

18.3.1 Create VDL:

A cubic spline interpolation will be done between each caliper reading to create a 180 point curve. The name of the curve will be whatever is entered as VDL output name. This curve will be used to do the plotting in the 3-D window and can also be plotted as a curve from Iplot.

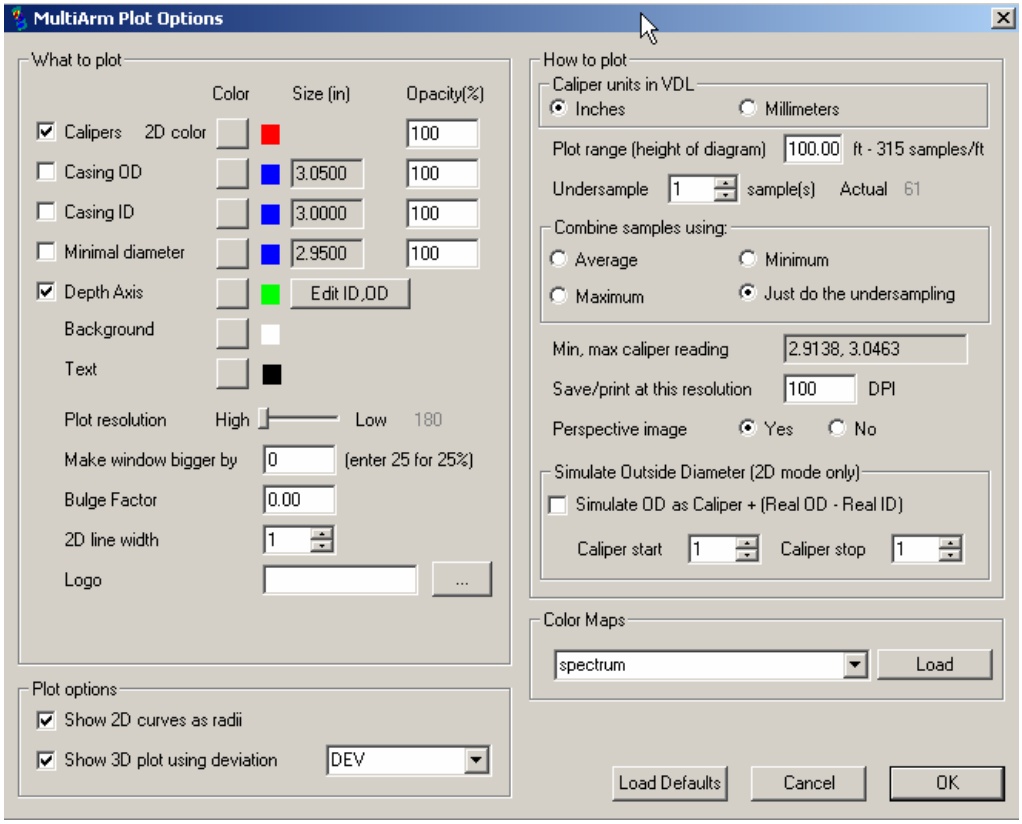


FIG: 18.9 Multi-Arm Plot Options

18.3.2 What to Plot

Select the check box of the item you would like to view. Select the Color button to change the color of the item to be viewed. The background color and the color of the text can also be changed. The Opacity value is how transparent the front part of the image is. An opacity of 100 means that you can not see through the image to the back side at all. An opacity of 0 means the front part of the image is not visible at all. The Casing ID and Casing OD values will be read from the database. Select Edit ID,OD to change these values. The default ID and OD values will be read from the LAS file entry that looks like the following:

User Entered ID = xxx
User Entered OD = xxx

The Casing ID and OD values can change with depth. Select the Zones button from the Variable Edit box to make more than one set of values.
Minimal Diameter:
The Minimal Diameter value is calculated to be the Casing ID minus the difference between the Casing OD and Casing ID. The Casing OD will then be the center of the range of colors to be plotted. To make the VDL plot match, use the Minimal value for the VDL black level, and the Casing OD value for the VDL white level.

18.3.3 Depth Axis

The Depth Axis will display a depth scale to the side of the diagram. The scale will be rotated with the image. If this option is not selected, then the depth and range will be displayed in the lower left corner of the diagram.

18.3.4 Plot Resolution
To speed up the plot to the screen, you can decrease the plot resolution. High resolution will plot all 180 data points for each sample. The lower the resolution the less data points will be plotted for each sample. A resolution of 2 will plot 180/2 data points for each sample.

18.3.5 Make Window Bigger
The “Make window bigger” option will change the range of values to plot. If it is zero, then the range of values will be from Minimal to OD. If it is 25, then the width of the window of data to plot is 25% greater than the value OD – Minimal. If this value is not zero, then to make the colors of the VDL match, you must use the range shown next to the spectrum, not the raw Minimal/OD values.

18.3.6 Bulge Factor:
The Bulge Factor will amplify the drawing by applying a magnifier to any reading that is different from the Casing ID. The Casing ID is taken to be a Nominal reading. If the value is less than the ID, then the caliper will be drawn as a value smaller than the actual reading. If the value is greater than the ID, then the caliper will be drawn as a value larger than the actual reading – hence the bulges in or out will be amplified. Here is how the value to be plotted is calculated:

Dif = Real Value – Inside Diameter;

Value to Plot = Real Value + Dif * Bulge Factor

To not amplify the bulges, enter 0 for a bulge factor.

18.3.7 Line Width
The 2-D line width is the thickness of the lines used for the 2-D plot.

18.3.8 Logo
On hardcopies and saved pictures, you have the option to add a logo to the upper left corner of the picture. The logo must be a Windows metafile format.

18.3.9 Plot Range
The Plot range is how tall the section of the log you want to view. The larger the range, the more points will be plotted, so you may want to increase the Undersample and Plot Resolution values to speed up the plot.

18.3.10 Undersample:
The 3-D view is created by a series of rings. Each ring is one depth sample. The undersample value is how many samples separate each ring. For the highest detail, set the undersample value to 1. Then the rings will be 1 sample apart, but it may take longer to draw. Increase the undersample value to speed up the plot, but decrease the resolution. The Actual value is what is actually used to draw. This number will never be smaller but may be larger than the undersample value. If your plot range is 200 ft. and your sample rate is 60 samples/ft, the undersample value may be 10 or 20 or more. This value takes in to account the resolution of the screen or printer and computes the lowest sample value needed to draw the diagram to that resolution. To draw to the absolute best resolution, leave the undersample value at 1. If the actual value is 20, then to see any increase in plot speed, you need to make the undersample value greater than 20.

18.3.11 Save/print Resolution
When you print, the larger the value for the resolution, the better quality the print is, but the longer it will take to print. For highest quality prints, set this to the resolution of the printer. The larger the save resolution value is, the larger the file size will be, but the better the resolution will be when the file is viewed/printed later. The default value for this is 100 to give fast yet good quality images.

18.3.12 Perspecive Image
If this option is yes, then the image will be drawn with a perspective view with items closer to the viewpoint being shown larger than items farther from the viewpoint. The viewpoint will be the center

of the image. If the option is no, then the image will be drawn with all points drawn as if they were the same distance from the viewpoint.

18.3.13 Saving

The plot can be saved in different file formats. Choose the format for the image to be saved as from the list at the bottom of the dialog that comes up when you select the save button. The image will be saved at the resolution that is set from the Options dialog.

18.3.14 Set the XY plot option

Note to increase the speed to print out set the value Actual more than 100 you should play with the Plot range and Undersample.

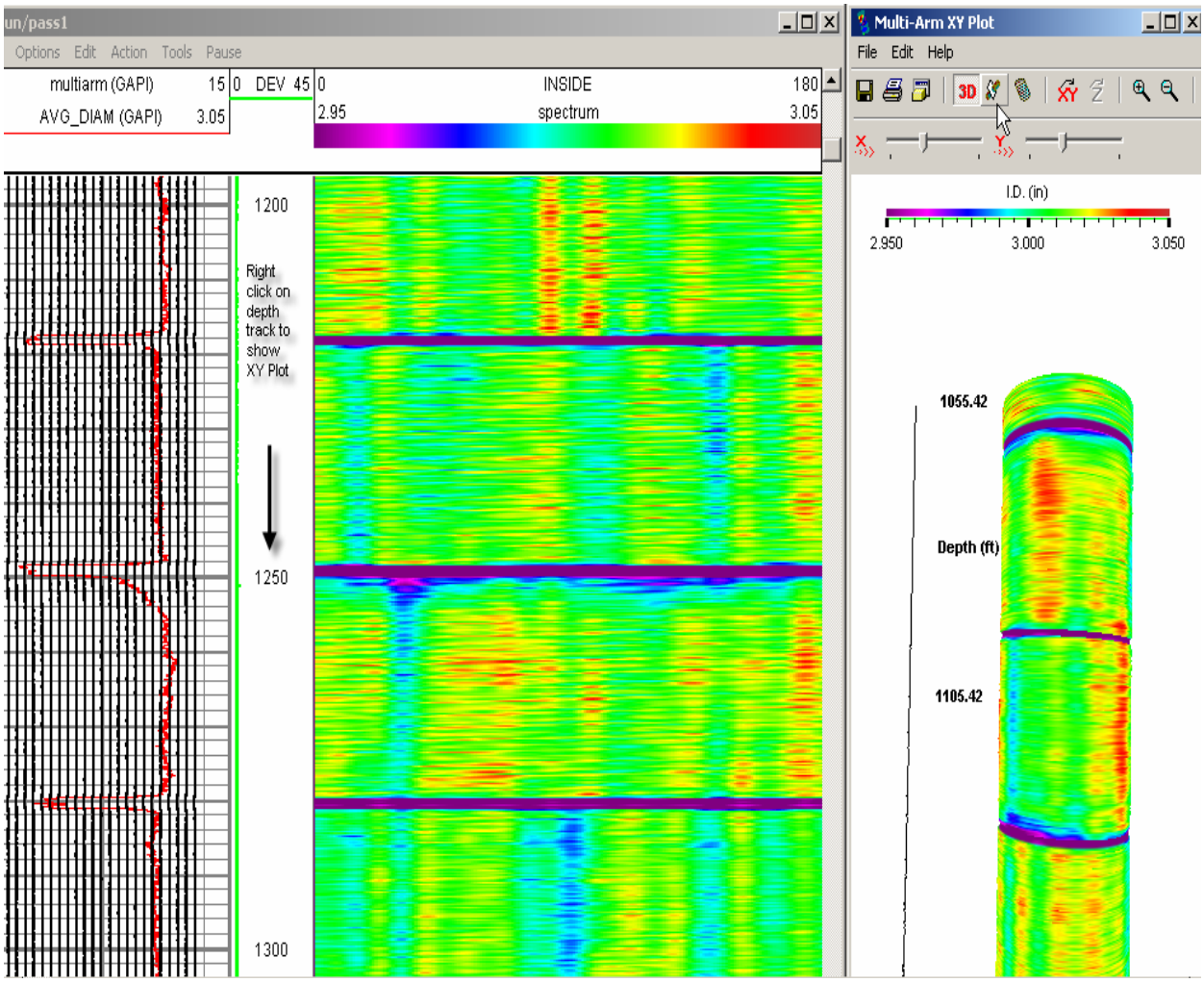


FIG: 18.10 IPLOT

Right click on depth track to update the XY plot and show the first time

18.3.14.1 3-D

Use this button to toggle between a 3-D view and horizontal cross section of the readings at the selected depth.
Click over 3D to see all the arms values.

18.3.15 Cross-section, Wireframe

The cross section button will do a vertical cross section. The wireframe view will show how the diagram is created. Each intersection of the wire frame is one data sample.

18.3.16 XY, Z rotation

When these buttons are pressed, use the mouse to drag and drop the image to another view, or use the arrow keys to rotate the image. You can also right-click in the image to activate the XY rotation and then rotate the image by moving the mouse without having to hold down the left mouse button. Right click again to deactivate.

18.3.17 Zoom in, Zoom out

With the Zoom in button selected, click on an area of the image to zoom in to. Click on the zoom out button to zoom back out.

18.3.18 Start Plot

This will start off Warrior Iplot and will also start the Multi-Arm XY Plot window. From the Warrior Iplot window, left click on any depth and an area around that depth will be displayed in the Multi-Arm XY Plot window. Right click on any depth in the Warrior Iplot window, and that window becomes sensitive to the mouse movements. As you move the mouse up and down, the Multi-Arm XY Plot window will be continuously updated. Right click again to disable the updates.
Save to storage a snap shot Pdf, TIFF, BIM formats

The Plus and Minus keys will always zoom in and out from the center of the diagram. Select the magnifying glass to zoom in to a particular point. Use the tab keys to move between menu items. Use the space bar or enter key to select the chosen item from the menu. If the zoom and rotation buttons are not selected, then you can click on the image to drag to move the entire image.

Section

19

19 Panels Hookups

DEPTH CABLE

Depth Panel 7 Pin Female	Interface Panel 7 Pin Male
A	A (Signal A)
B	B (Signal B)
D	D (5 Vdc)
F	F (GND)
G	

ENCODER CABLE

7 Pin Male	Depth Encoder 7 Pin Female
A	A (Signal A)
B	B (Signal B)
D	D (5 Vdc)
F	F (GND)
G	

TENSION CABLE

Depth Panel 5 Pin Female	Interface Panel 5 Pin Male
C	A
D	B
E	E

TENSION TRANSDUCER CABLE (XPRO-HONEYWELL PRESSURE TRASMITER)

5 Pin Male	Pressure Transducer
D	1 (Excite Usually Red)
B	2 (Signal Usually Black)
A — Shield	3 (Case)
E	

TENSION TRASDUCER CABLE (ASCO PRESSURE TRANSMITER)

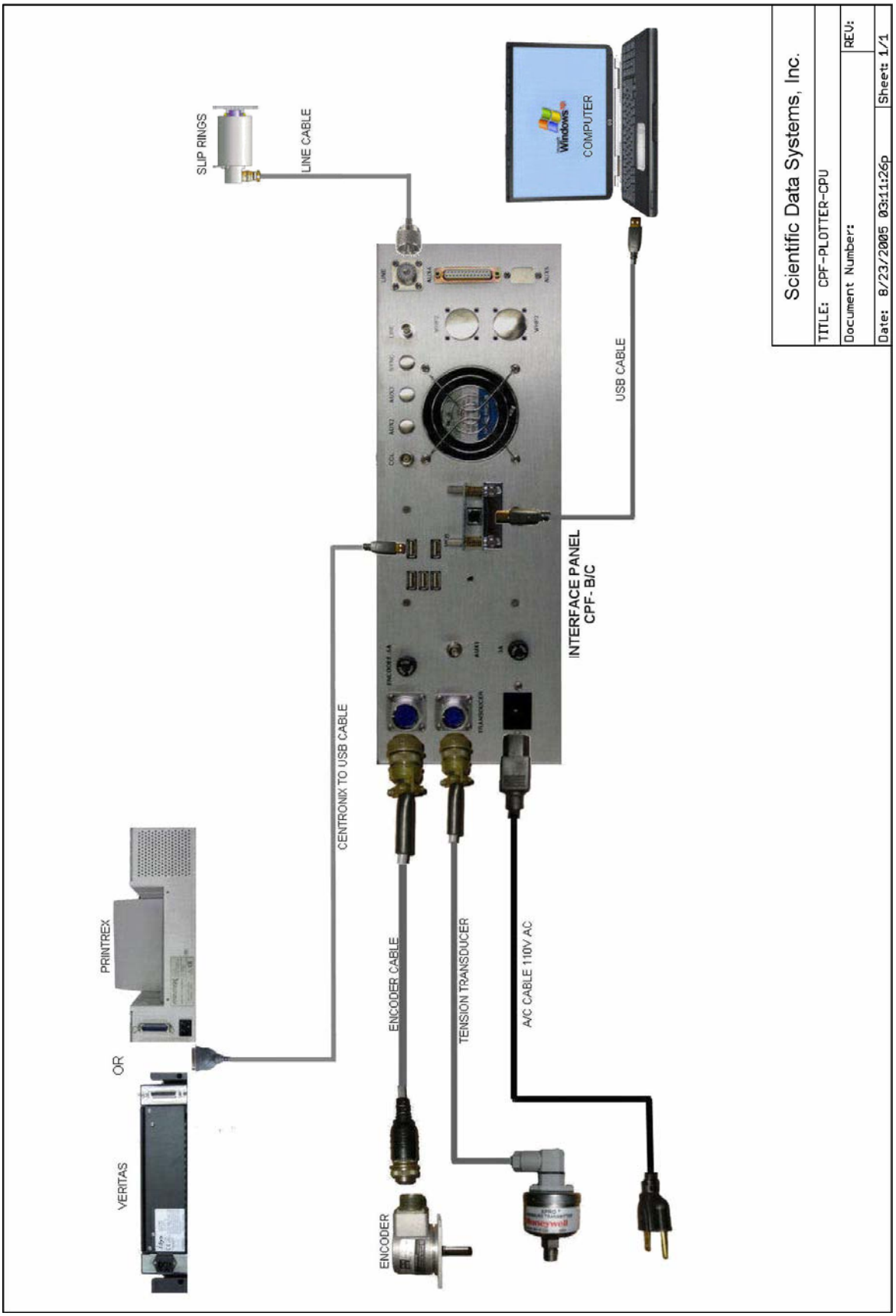
5 Pin Male		Pressure Transducer
D		3 (Excite Usually Red)
B		2 (Signal Usually Black)
A	Shield	
E		

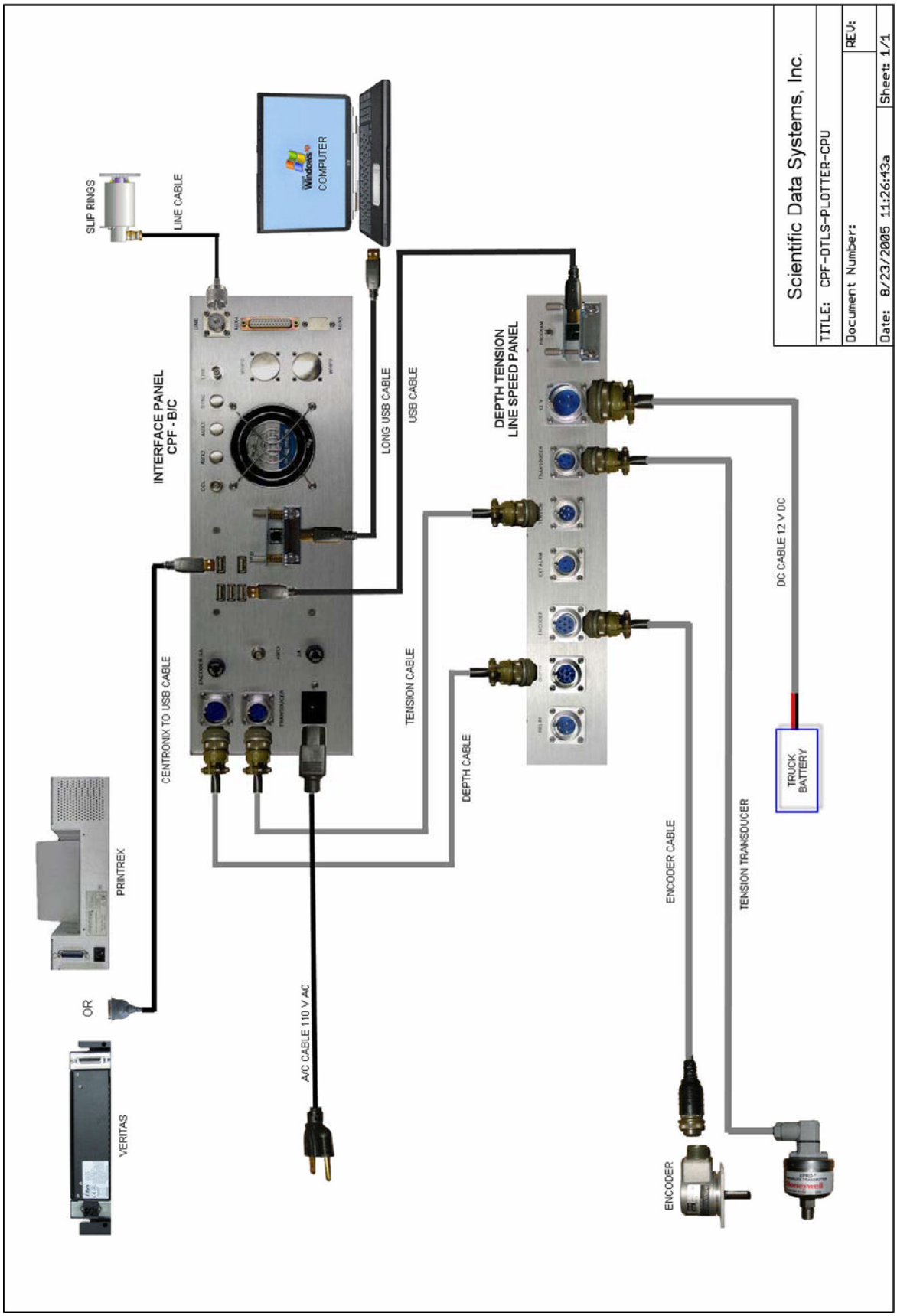
DC CABLE 12V DC

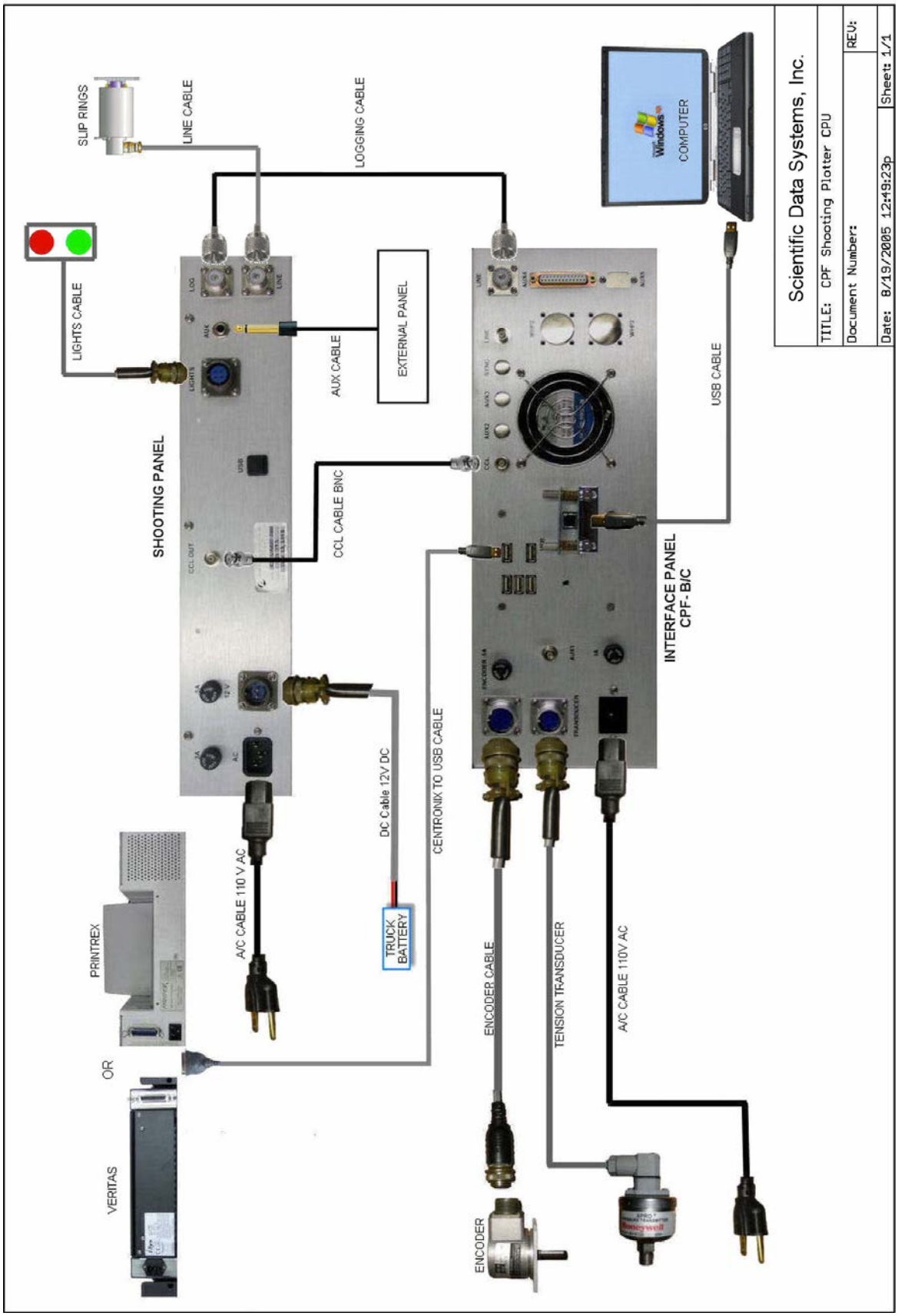
3 or 2 Pin Male	Battery Truck (12 VDC)
A	Positive
B	Negative
C	NC

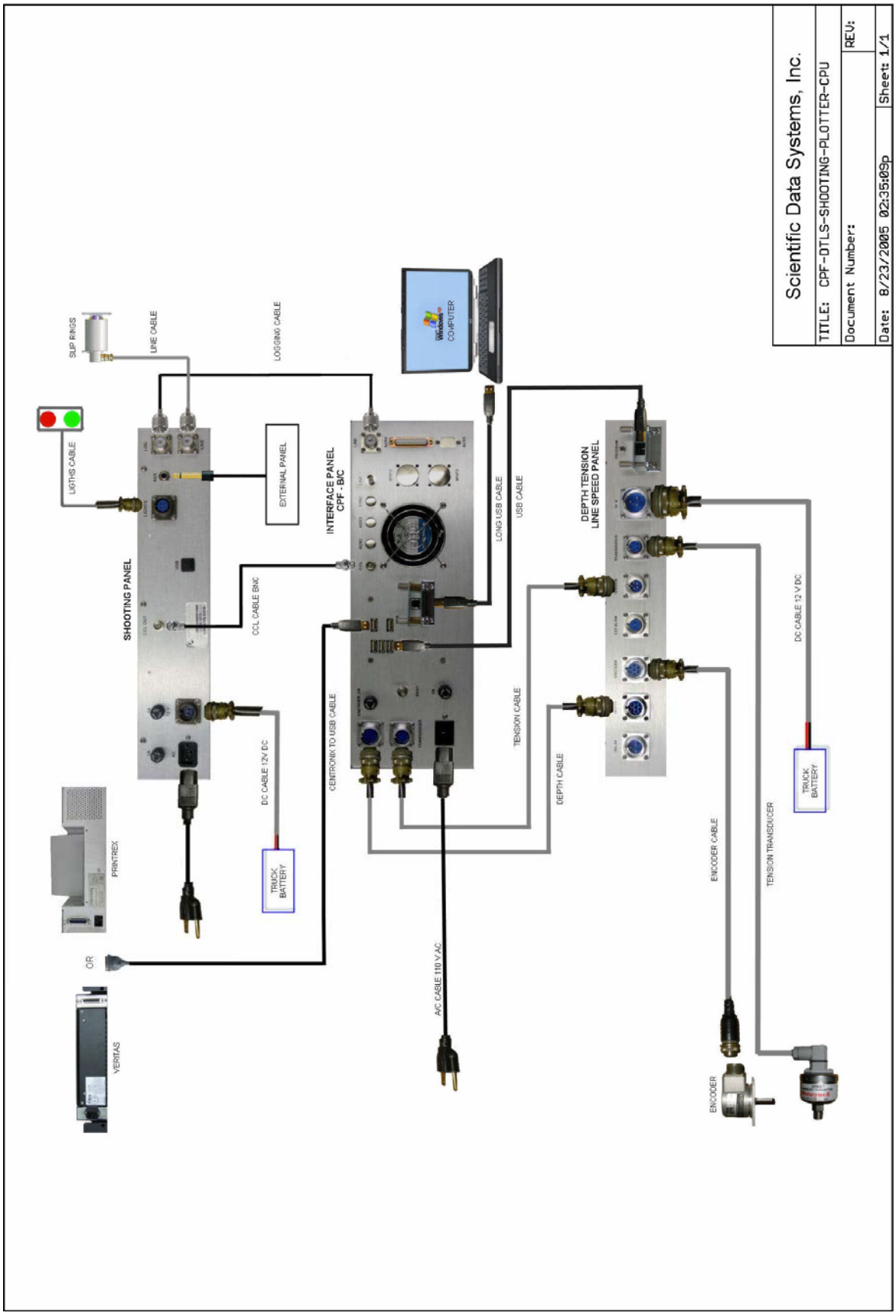
LIGHTS CABLE

4 Pin Male	Lights
A	Common
B	RED Light
C	GREEN Light
D	NC


Scientific Data Systems, Inc.
TITLE: CPF-PLOTTER-CPU
REV:
Document Number:
Date: 8/23/2005 03:11:26p
Sheet: 1/1
SLIP RINGS
LINE CABLE
COMPUTER
USB CABLE
INTERFACE PANEL
CPF- B/C
CENTRONIX TO USB CABLE
PRINTREX
OR
VERITAS
ENCODER CABLE
TENSION TRANSDUCER
A/C CABLE 110V AC
ENCODER


Scientific Data Systems, Inc.
TITLE: CPF-DTLS-PLOTTER-CPU
Document Number:
REV:
Date: 8/23/2005 11:26:43a
Sheet: 1/1
SLIP RINGS
LINE CABLE
COMPUTER
INTERFACE PANEL
CPF - B/C
LONG USB CABLE
USB CABLE
DEPTH TENSION
LINE SPEED PANEL
CENTRONIX TO USB CABLE
TENSION CABLE
DEPTH CABLE
DC CABLE 12 V DC
PRINTREX
OR
VERITAS
A/C CABLE 110 V AC
ENCODER CABLE
TENSION TRANSDUCER
TRUCK BATTERY
ENCODER


Scientific Data Systems, Inc.
TITLE: CPF Shooting Plotter CPU
Document Number:
REV:
Date: 8/19/2005 12:49:23p
Sheet: 1/1
SLIP RINGS
LINE CABLE
LOGGING CABLE
COMPUTER
LIGHTS CABLE
AUX CABLE
EXTERNAL PANEL
USB CABLE
SHOOTING PANEL
CCL CABLE BNC
INTERFACE PANEL
CPF-B/C
DC Cable 12V DC
CENTRONIX TO USB CABLE
PRINTREX
A/C CABLE 110 V AC
TRUCK BATTERY
OR
VERITAS
ENCODER CABLE
TENSION TRANSDUCER
A/C CABLE 110V AC
ENCODER


Scientific Data Systems, Inc.
TITLE: CPF-DTLS-SHOOTING-PLOTTER-CPU
Document Number:
REV:
Date: 8/23/2005 02:35:09p
Sheet: 1/1
SLIP RINGS
LINE CABLE
LOGGING CABLE
COMPUTER
LIGTHS CABLE
EXTERNAL PANEL
INTERFACE PANEL
CPF - B/C
SHOOTING PANEL
DEPTH TENSION
LINE SPEED PANEL
LONG USB CABLE
USB CABLE
CCL CABLE BNC
DC CABLE 12v DC
CENTRONIX TO USB CABLE
TENSION CABLE
DEPTH CABLE
DC CABLE 12 V DC
TRUCK BATTERY
PRINTREX
OR
VERITAS
A/C CABLE 110 V AC
ENCODER CABLE
TENSION TRANSDUCER
ENCODER

Section

20

20 Job Planner

The primary purpose is to assist in the design and assembly of perforating strings and help the user execute perforating and TCP jobs. For TCP jobs, the end result will be an inventory of all the items required to complete your TCP string. For wireline jobs, you will have a list of all the runs you plan on making and the design of each tool string that goes in the hole. For either type of job, you build every gun to your specifications, and then add all the other components required to complete the tool string.

20.1 TCP Jobs

For TCP, the job table will be the inventory list of all the items that will go in the hole.

20.2 Wireline Jobs

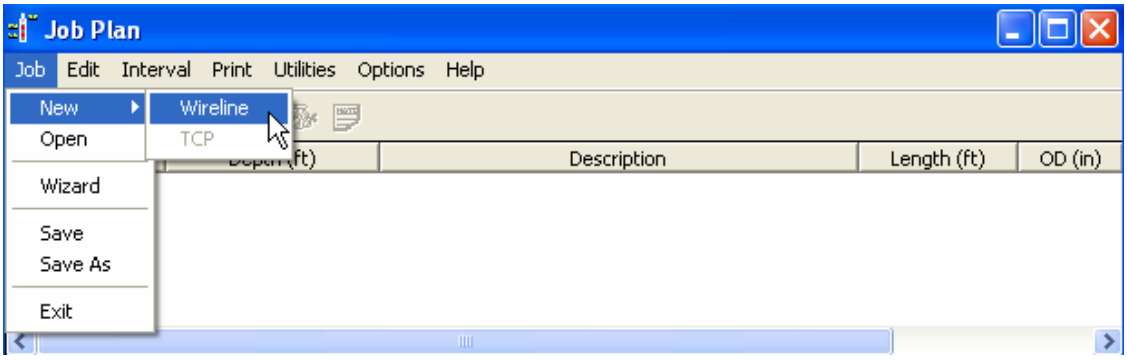


FIG: 20.1 Job Plan

For Wireline jobs, the job table will be a list of all depth intervals that you will be dealing with during your job. One line in the job table will indicate either a depth to be perforated or a depth to set a plug or a depth to cut casing.
Each job consists of 1 or more Runs. Each Run contains 1 or more Intervals. Each run has a Base Service. The Base Service is what service will be run in the hole that will be attached to the gun, plug, whatever. Each interval consists of either a single depth or a single depth range (top depth - bottom depth). A run may contain more that 1 interval if the string contains a select fire assembly, or is a core gun, or is any other combination of devices that can be activated over more that one depth or depth range. The other possibility is that you may have more than one interval that will be part of one gun. If you have to perforate from 5000-5002 and 5008-5010, then that may be achieved with 1 10' carrier but will still have to be entered as 2 intervals. The program will verify with the user if two intervals can be placed in the same carrier and that will be shown in the Job table by two intervals with the same serial number. Serial numbers of guns will be generated by the system and not editable by the user.

One interval takes up one line in the Job table. An interval consists of a single depth or a single depth range (top depth - bottom depth). An interval must be associated with a run name and a base service and also must consist of some type of device.
here are two types of inventory you will need to do in order to take full advantage of the job plan module.

20.2.1 Tools Inventory:

Since the purpose of this is to design perforating and TCP jobs, to start you need to make entries for all the equipment you will run in the hole using the Tools Editor. This includes gun subs, sinker bars, tandem subs, setting tools, firing heads, etc. Some items you may want to create as non-serial items so you can add as many to a tool string as you need. In order for this to properly calculate offsets and tool string lengths, all items that go in the hole that modify the length of the tool string need to be added to the tool string through the tool string editor. For example, if you choose a 10' carrier for a perforating job, that carrier will automatically be added to the bottom of the service you have chosen. But you will have to add the top and bottom gun subs to the tool string through the tool string editor.

20.2.2 Perforating Inventory:

From the job plan module, you can create the gun types that you use. From job plan menu select Job->Wizard, and then go to the Build guns tab. From there you can create your gun types and charge types that you use. Right click on the Gun Type, and then select New Item or New Category. Each gun type can have 0 or more categories and each category can have 0 or more items associated with it. Categories are optional. For each item you create, you will see a picture on the right side. Just click on the item you want to edit. When you are done, select **Save** gun type. Now when you go to creating a perforating job, you will select from your inventory and the gun will automatically be filled in with the requested shot length. You will be warned if the requested shot length does not fit in the gun you selected.

20.3 Getting Started

There are two types of inventory you will need to do in order to take full advantage of the job plan module.

20.3.1 Tools Inventory:

Since the purpose of this is to design perforating and TCP jobs, to start you need to make entries for all the equipment you will run in the hole using the Tools Editor. This includes gun subs, sinker bars, tandem subs, setting tools, firing heads, etc. Some items you may want to create as non-serial items so you can add as many to a tool string as you need. In order for this to properly calculate offsets and tool string lengths, all items that go in the hole that modify the length of the tool string need to be added to the tool string through the tool string editor. For example, if you choose a 10' carrier for a perforating job, that carrier will automatically be added to the bottom of the service you have chosen. But you will have to add the top and bottom gun subs to the tool string through the tool string editor.

20.3.2 Perforating Inventory:

From the job plan module, you can create the gun types that you use. From job plan menu select Job->Wizard, and then go to the Build guns tab. From there you can create your gun types and charge types that you use. Right click on the Gun Type, and then select New Item or New Category. Each gun type can have 0 or more categories and each category can have 0 or more items associated with it. Categories are optional. For each item you create, you will see a picture on the right side. Just click on the item you want to edit. When you are done, select save gun type. Now when you go to creating a perforating job, you will select from your inventory and the gun will automatically be filled in with the requested shot length. You will be warned if the requested shot length does not fit in the gun you selected.

20.4 Job Wizard

Use the Job Wizard to complete the information for your job. You will have 4 pages (tabs) of information to fill out. The first 3 tabs will be the same whether you are doing a TCP job or a Wireline job.

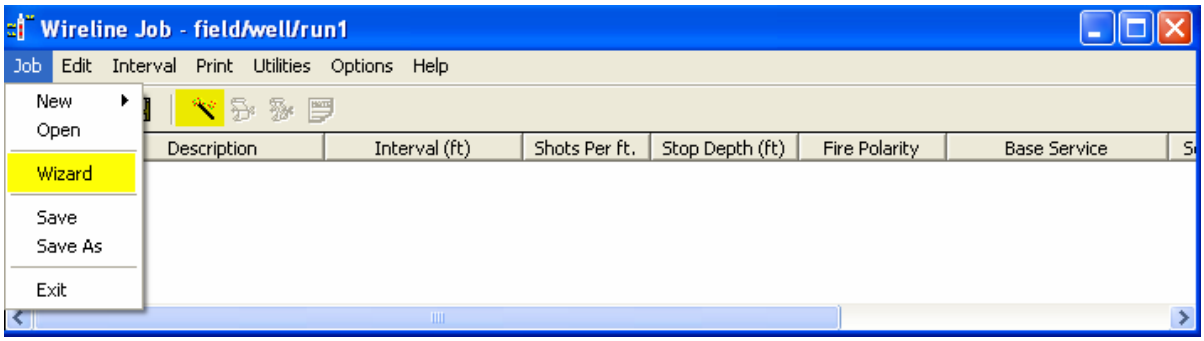


FIG: 20.2 Job Wizard

20.4.1 Job information

You can enter the database name of the correlation log here. If you have a correlation log entered here, when you set your results, a well object will be added to this pass indicating the completion of that interval. All of the other information is for reference use only.

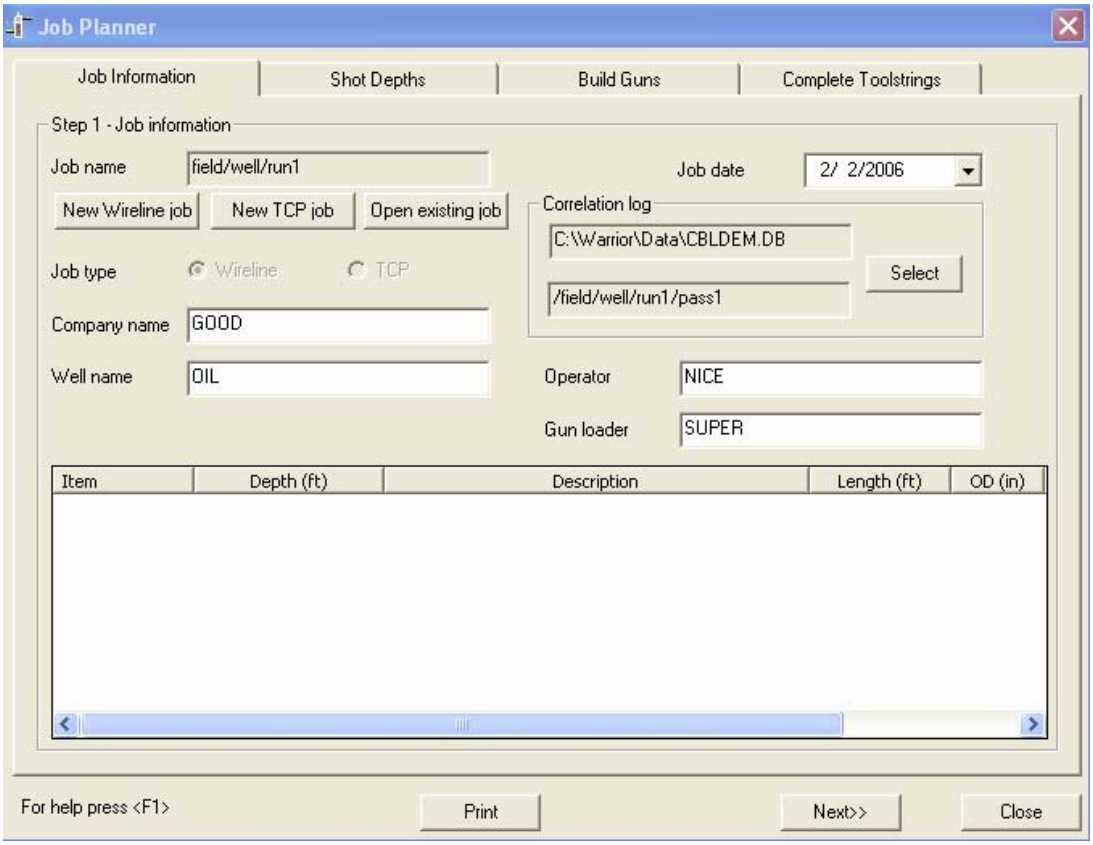


FIG: 20.3 Job Planner

20.5 Shot Depths

Enter your shot depth information here. Fill in the job table with shot depths or select an item from the list to edit. To enter a new interval, if the button says Update interval, press the Clear selection button. Then type in your new depths and select the Add interval button.

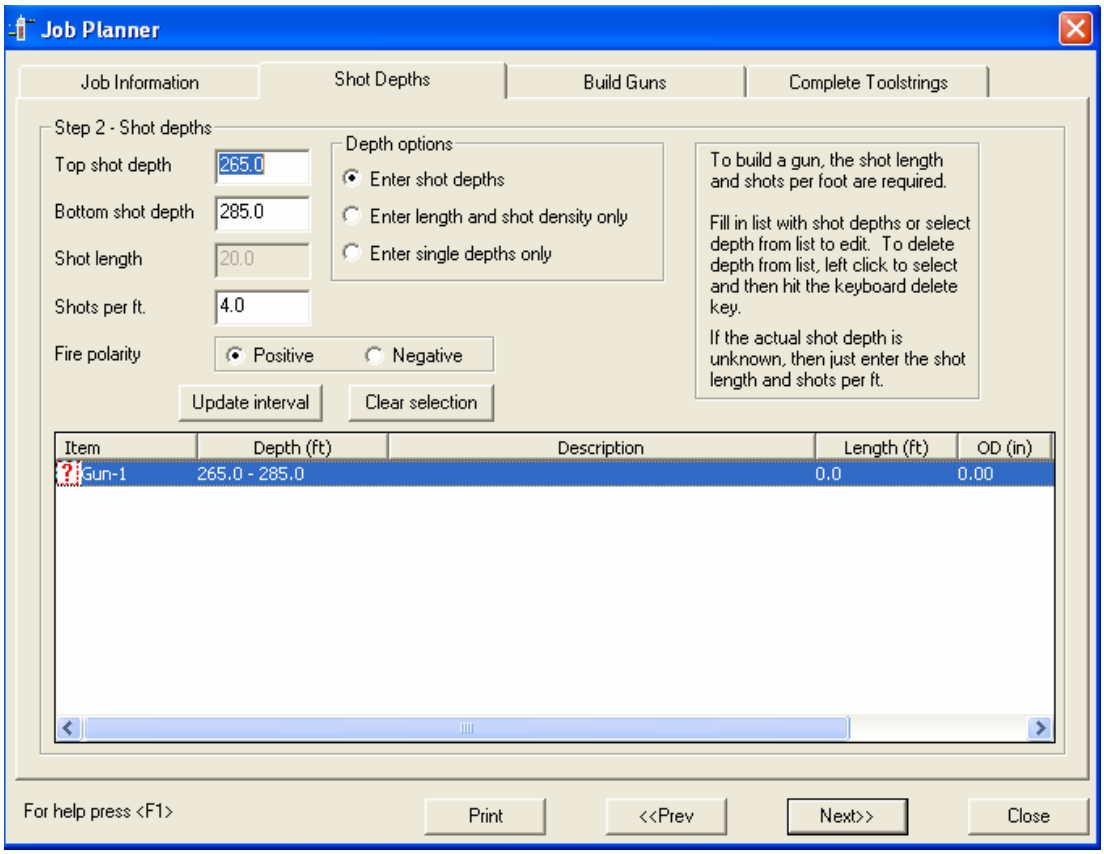


FIG: 20.4 Job Planner

20.6 Build Guns

Now that you have intervals in your table, you need to assign a gun type to your depth interval. If you have no gun types in your list, then you have to create new ones (see Gun types below). To assign a gun type, first select the interval from the list of intervals, and then choose the gun type from the list of gun types. If you want more than one interval to fit in one gun, then select more than one interval by using <ctrl> left click. If the intervals can fit in one gun, then a message will pop up reminding you that more than one interval has been assigned to a gun. Otherwise the same gun will be assigned to each of the selected intervals. You should see your gun in the picture on the right. The parameters that show up (length, top shot, etc.) are the ones that you assigned to that gun type. You can edit any of those parameters to change them for this gun by clicking on any of the values and typing in new values.

The gun will be loaded by default starting at the top of the gun. To change where the loaded interval starts, click in the loaded area of the gun (where the red dots are) and slide the loaded interval up or down. The distance to the top shot and bottom shot will change as you slide the loaded interval. The distance to the top shot can be no less than the top loadable number and the distance to the bottom shot can be no more than the bottom loadable number.

When you are viewing the design of a gun with no interval assigned to it, the shots will be indicated in black. When you are viewing a gun that does have an interval assigned to it, the interval will be displayed in the upper left part of the diagram and the loaded interval will be indicated by red shots.

You can print a picture of the gun from here to give to the gun loader.

20.6.1 Gun types

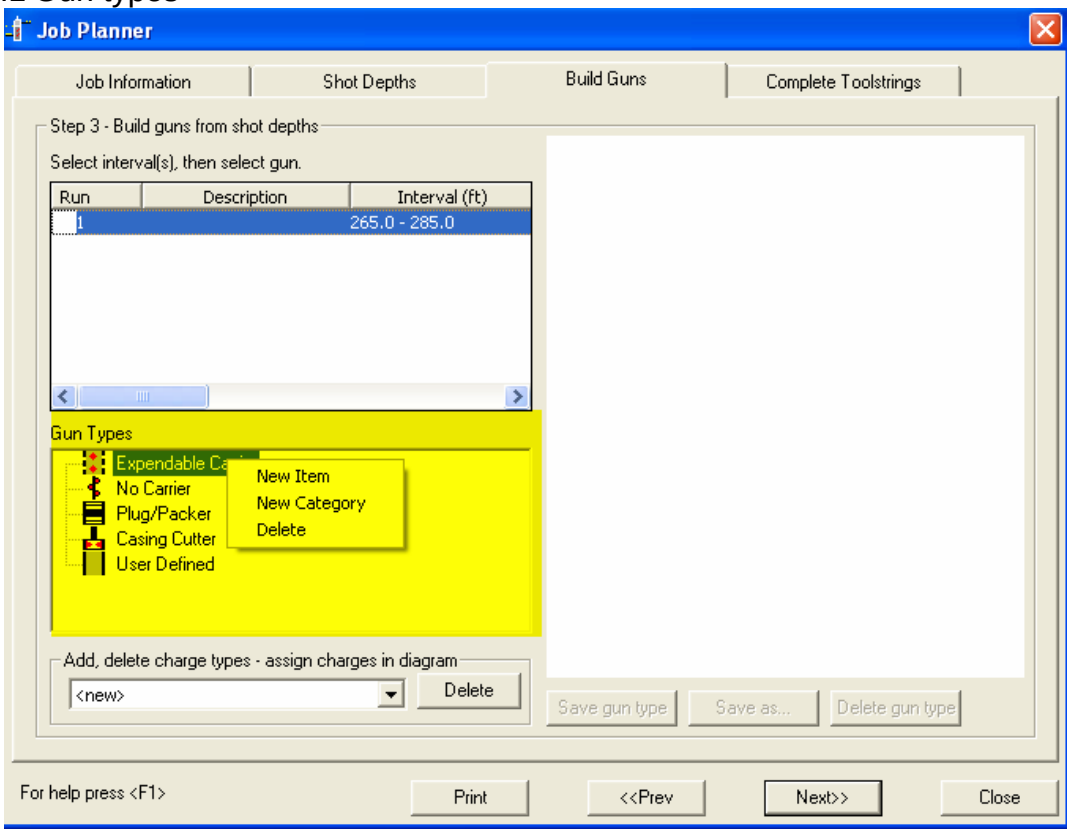


FIG: 20.5 Gun Types

FIG: 20.6 New Item

There are several predefined gun types or you can add your own gun type. Your own gun type will require a metafile picture to go with it. To add new items, right click on the Gun type and then select New Item, New Category, or Delete. For each type of gun, you can have 0 or more categories, and then for each category you can have 0 or more items. You can drag and drop items and categories within their gun type if you want to organize things differently. All of the gun and charge type information goes in the file explobjs.ini so once you have all the standard gun information entered; you can pass out copies of this file.
Once you have a new gun showing in the window on the right, you can edit any of the parameters for the gun. All entries are edited by clicking on the value to be edited and then typing in a new value. The following entries are critical to having the gun diagrams and shot calculations come out properly. The Total length value is the total length of the item without any gun subs. The Top shot value is the distance from the top of the gun body to the top shot. The Shot length is the maximum shot length that this type of gun can be loaded. All of the parameters can be edited for a specific gun once you

assign this gun to an interval in case you have a carrier that is slightly different from the generic gun type you created.

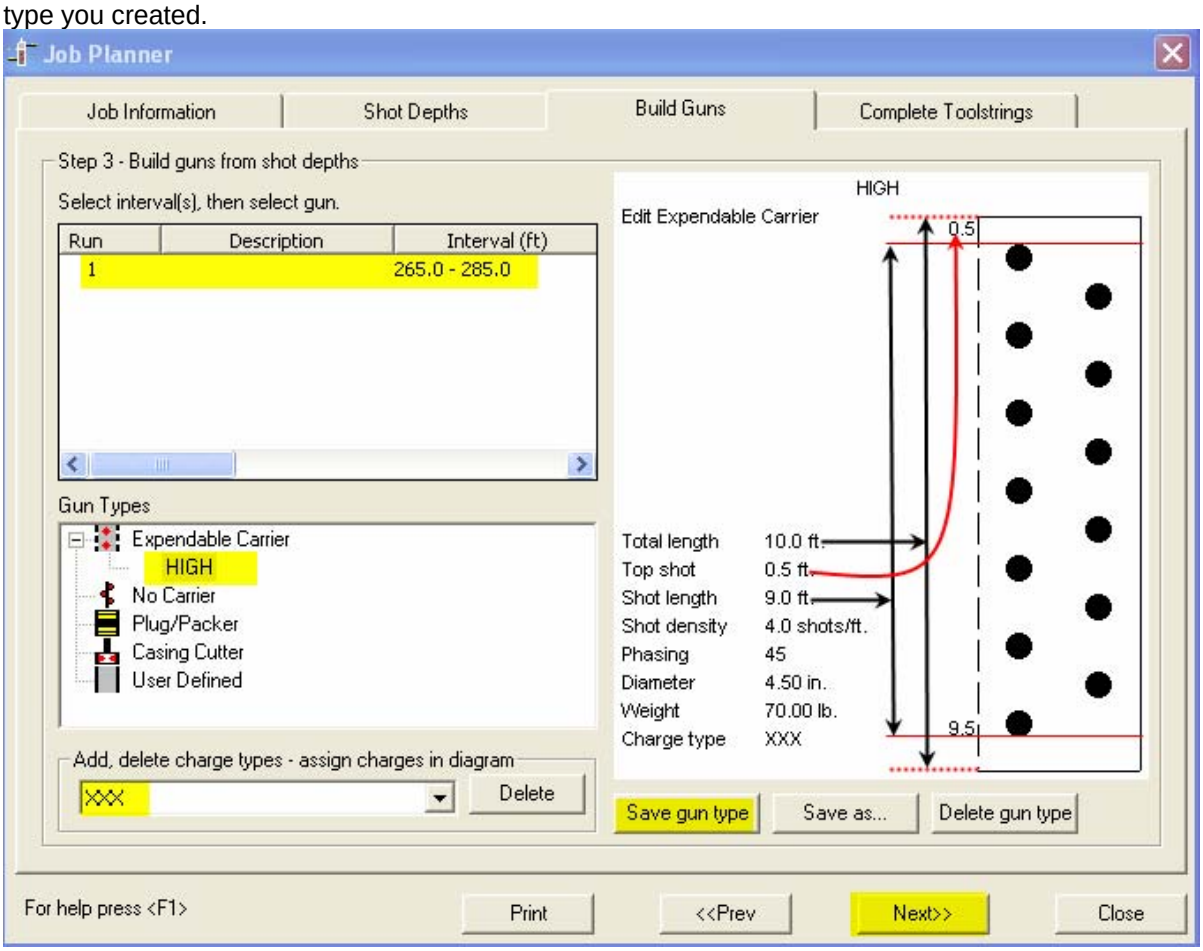


FIG: 20.7 New Gun Type

20.6.2 Charge types

All of the charges that you create in this list will show up in the list of charge types that you can choose from when you edit your gun parameters from your gun picture on the right.

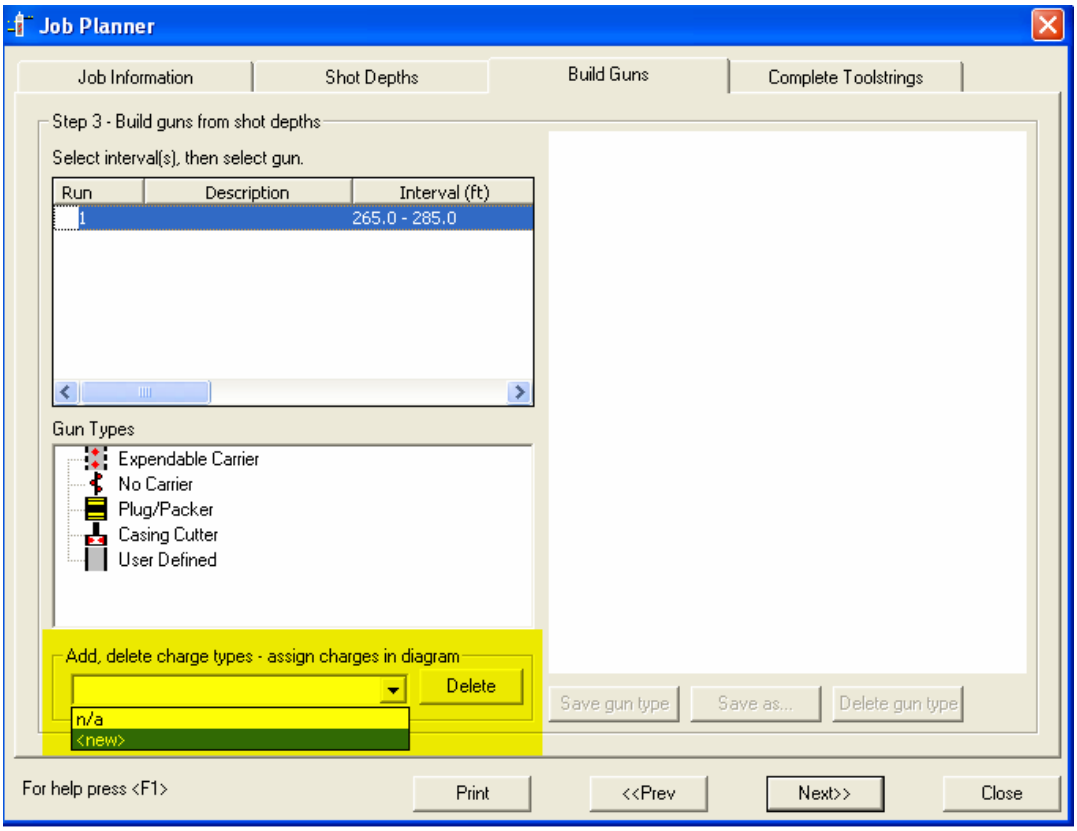


FIG: 20.8 Add New Charge

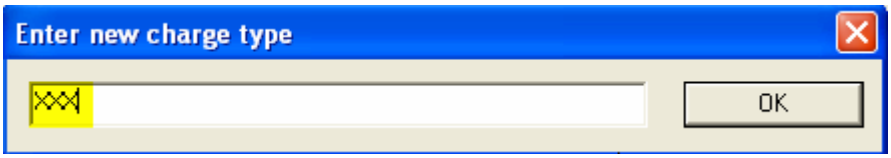


FIG: 20.9 New Charge

20.7 Build TCP string

Selected TCP for the job type, then you will see this tab. The TCP job is centered around the gun shot depth, so as you add items to the string, their depth will be calculated based on the gun shot depth. To find items to add to the TCP string, select the Edit TCP string button. This will bring up the tool string editor and allow you to add and remove items from your TCP string. It is up to the user to add any gun subs to the carrier to make the diagram complete. If you have more than one gun in the TCP string, the depths will be referenced off of the top gun. You will have to fill in items below the top gun to get the rest of the guns on depth or you will get a warning message. When you are completed with your TCP string, and then select the Finish button.

20.7.1 Off Depth Warning:

If you have more than one gun in the TCP string, then you may get a warning message that displays how far off depth the gun is. The depth value is the amount of space you need to add above that gun

to make it come out on depth. If it is negative, then you have too much space above the gun. From the Build TCP String tab, you can modify that amount by changing the value TCP Depths must be within. The default is 0.25 ft.

20.8 Build Tool Strings

Selected Wireline for the job type, then you will see this tab. The first thing you have to do is assign a service to one or more intervals. From the services editor, there is an option for every service – **"Make this service available for perforating".** Only the services that have this option checked will show up as services you can assign to a perforating interval.
Select one or more intervals from the list that will be run in the hole on one tool string. Say you have 10 intervals in the list. You may have two intervals that you will perforate with one run in the hole - either with select fire or because they both fit on one gun. Once you have those items selected, then choose a service from the list of services at the bottom of the screen and then select the Assign Service button. The tool string editor will start up with those selected guns in the tool string as well as the tools from the service you selected. It is up to you to add your gun subs and any other items to make this match what you are running in the hole. When completed, select the Finish button.

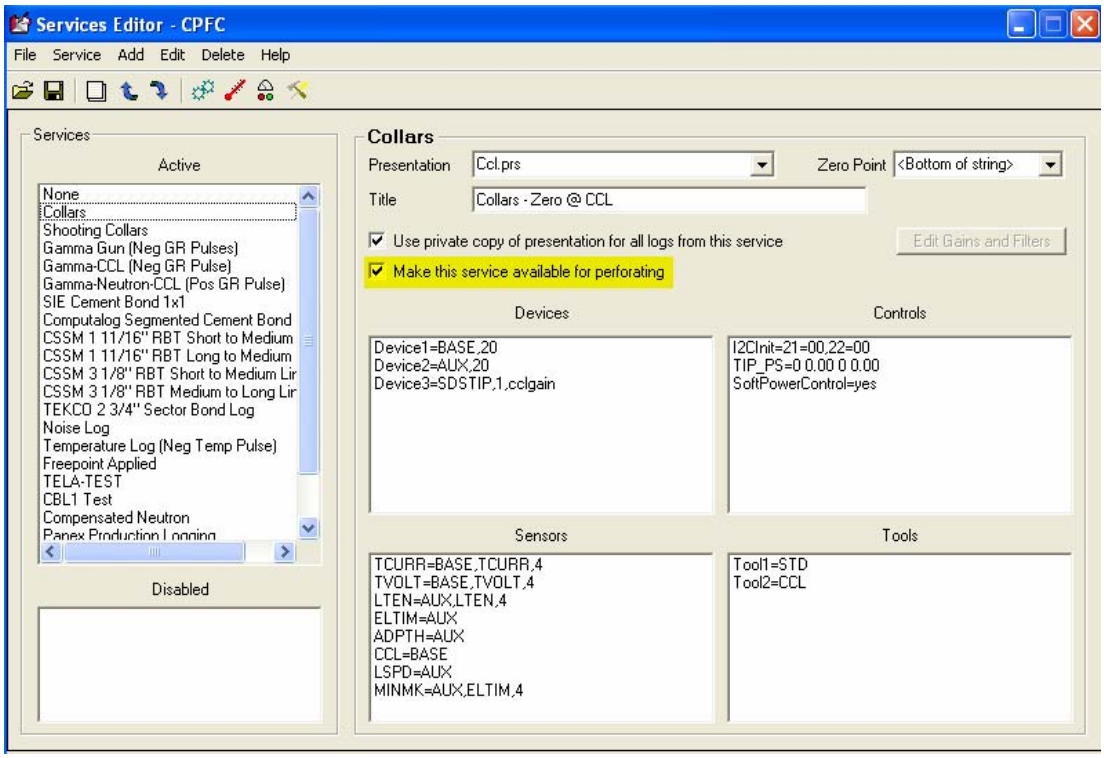


FIG: 20.10 Service editor

20.9 Main Window

20.9.1 Job menu

Saving a Job: The following information will be saved with each job:

20.10 The job plan itself

- /f/w/r/_jobplan_/_job_/1

The results of the job

- /f/w/r/_jobplan_/_report_/1

Each tool diagram

- /f/w/r/_jobplan_/_wtd_/[name]

The TCP diagram (for TCP jobs)

- /f/w/r/_jobplan_/_tcp_/1

20.11 Utilities

Insert a Well Object into a Log: Will create a well object in the run you have chosen. The tool diagrams will be saved in the database also, so you can re create the picture.

20.11.1 Import/Export

The loaded job can be exported to a floppy disk to be imported on another machine. The floppy will contain one file with the job information as well as tool diagram files for the guns. Note that every gun has a serial number assigned to it. When the job is imported to another machine, those gun serial numbers may already exist, so the imported serial numbers may be reassigned to prevent conflicts.

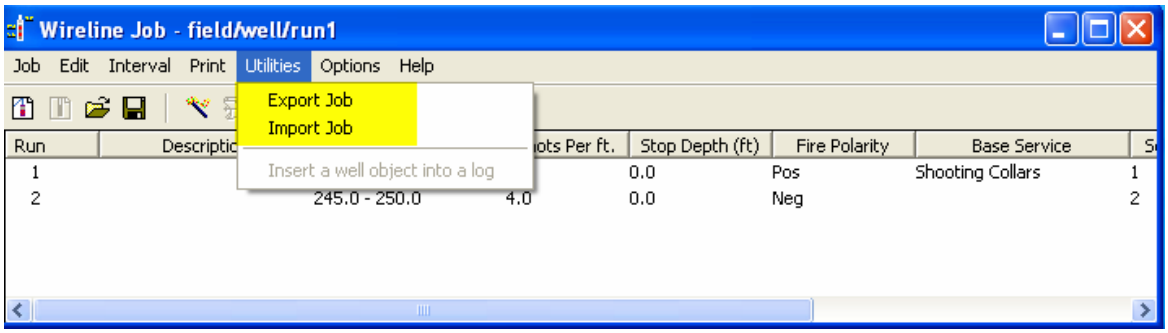


FIG: 20.11 Utilities Charge

20.11.2 Changing order of runs

Let's say you have 2 different runs created. Then you decide you want to have run 5 be the first run. Click on run 2 and drag it up above run 1 and drop it. You will be asked "Move run 5 before run 1?". The run numbers will be rearranged; run 5 will be called run 1, run 1 will be called run 2, etc. The renumbering will always start at 1.

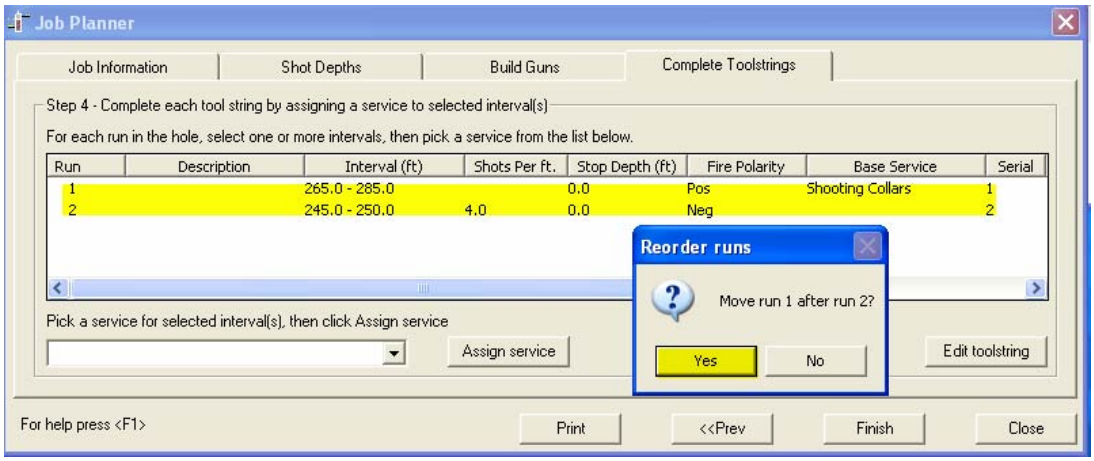


FIG: 20.12 Reorder Runs

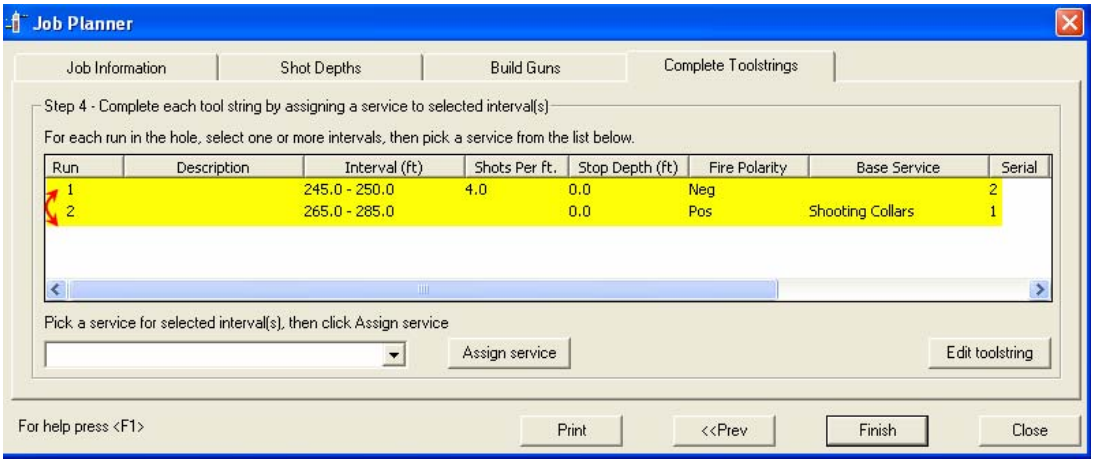


FIG: 20.13 Job Planer swap Runs

20.11.3 Running a wireline job

Now that you have built a custom service for each run in the hole, you will control the service that is loaded from Job Plan. Right-click the run you are making from the list of runs and select Load Service. That will start Acquisition with the selected run. Make sure the tool diagram matches what is going in the hole, including gun subs. If this does not match exactly, then your Stop Depths will not be calculated correctly. When you close the tool diagram window, the Stop Depth will be updated, indicating the depth to stop the hoist to make the perforation. If you have made a previous run with this service, then Acquisition should load with the next free pass as the Dataset.

In the Depth Configuration screen, there is a “Stop Depth” setting that you can use to indicate when your logging depth is close enough to perforate.

20.12 Active interval

You will also notice there is an Active Interval choice below Load Service. Since a single run in the hole can have more than one interval associated with it, you can choose the interval within the loaded service you want to be active. If you only have one interval within the run, then that interval will be active. The active interval will change the color of the depth to green when the hoist depth is at the active interval stop depth. Also, the active interval will have an icon next to the run indicating it is active.

20.12.1 Results

Once you have completed one interval, right click on the interval and select Results. Your interval will show a different icon dependent upon what choice you make for your results. You can also add a text string to go with your results. You must at least choose one of the options (Successful, Unknown, Missfire) so you can keep track of the runs you have made already. If you choose Successful, then it will automatically add a perforating or plug well object to the log pass. If you have a correlation log entry in your Job Information screen, then the well object will be added to that log pass. Else the well object will be added to the current log pass.

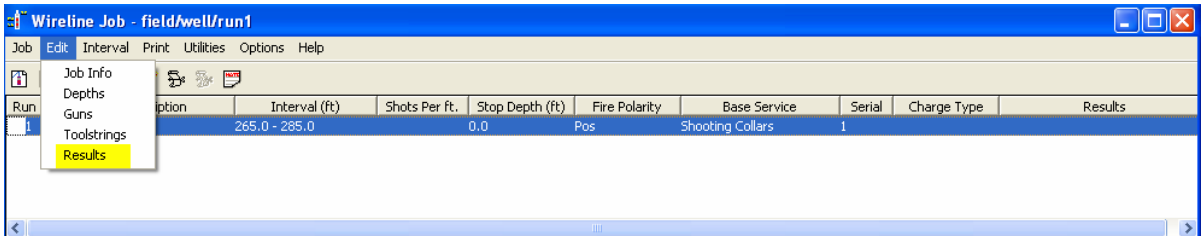


FIG: 20.14 Results

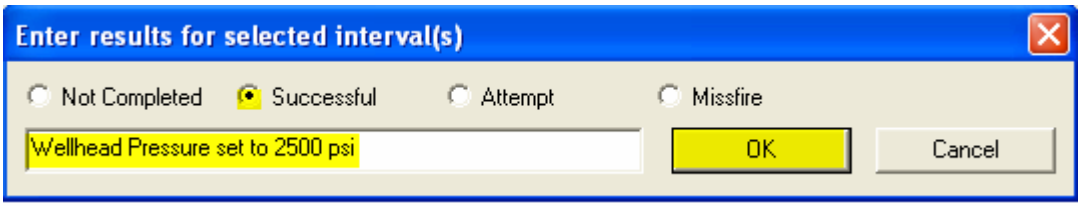


FIG: 20.15 Comments

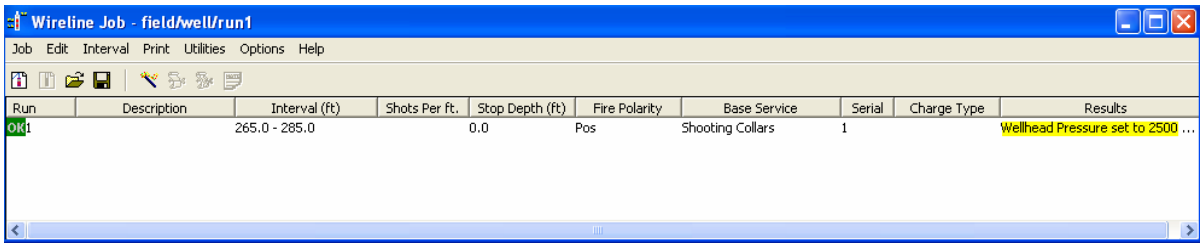


FIG: 20.16 Job Status

20.13 Print

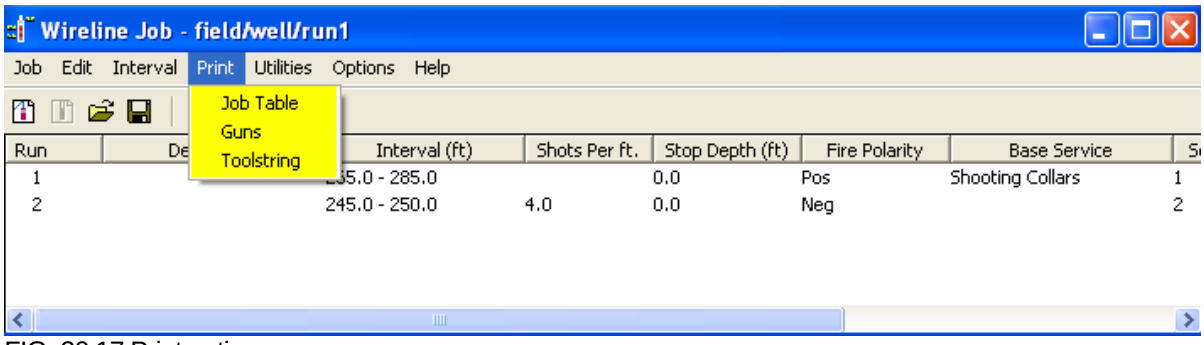


FIG: 20.17 Print options

Select the option to print.

Section

21

21 USB Shooting Panel

The shooting panel has a new additional option Safety Software Key to run guns, if the panel has the USB port available (USB board inside), it should be connect to USBHUB back to the interface panel ,add the DEVICE, SENSORS and Check the box to **Make this service available for perforating** must be include in the service
Setup in the software the new device, add the **Device** CYSHPNL, 4

21.1 Software set up

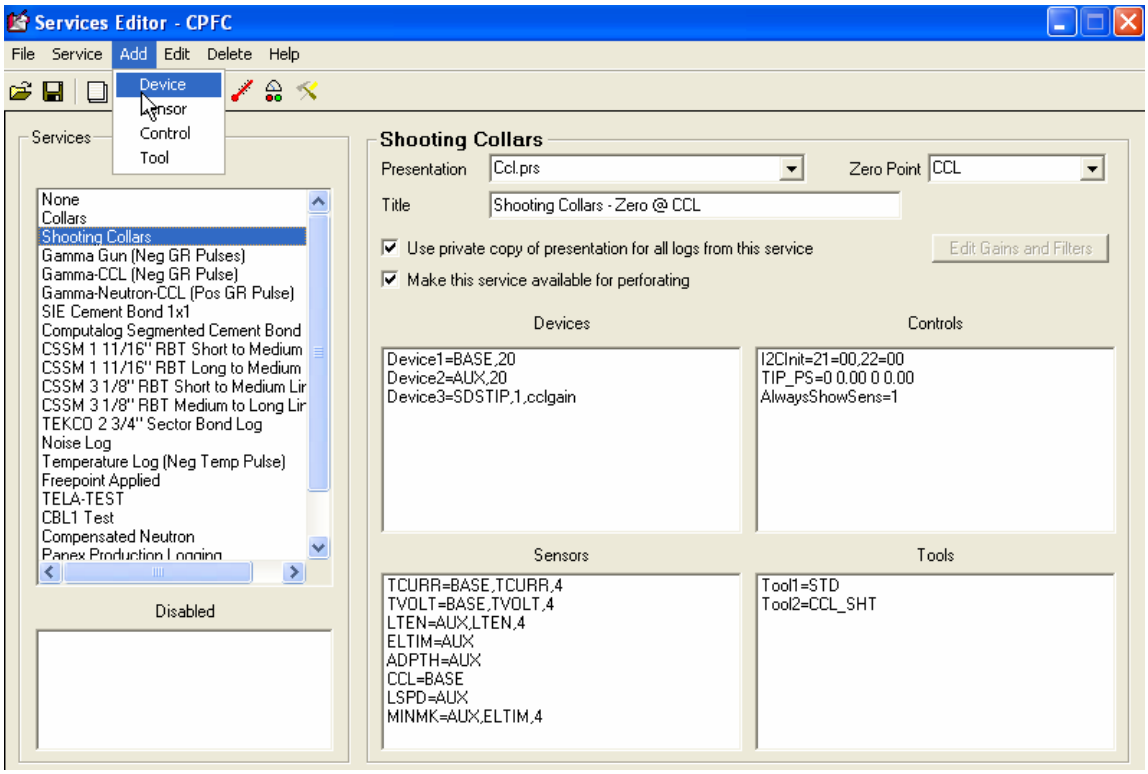


FIG: 21.1 Device

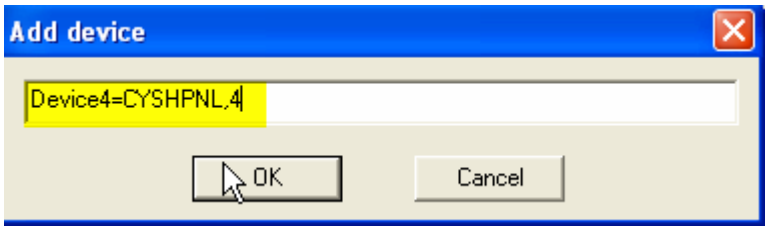


FIG: 21.2 Add Device

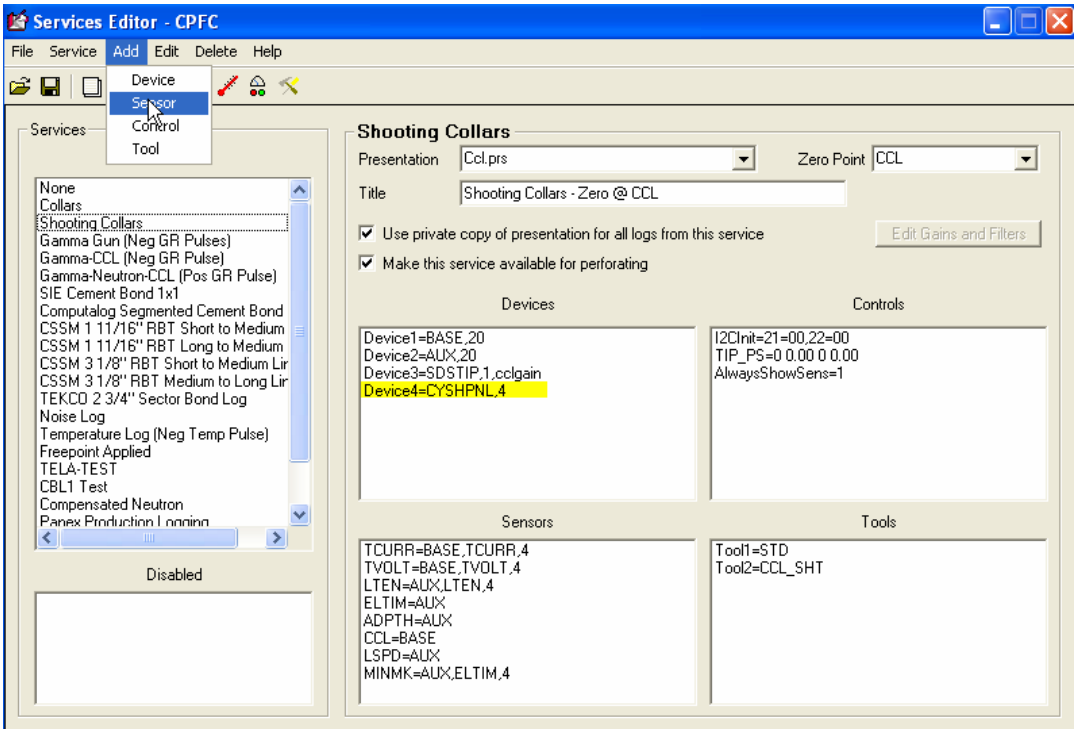


FIG: 21.3 Sensor

Add the new two **Sensors** SHVOLT=CYSHPNL, and SHCURR=CYSHPNL

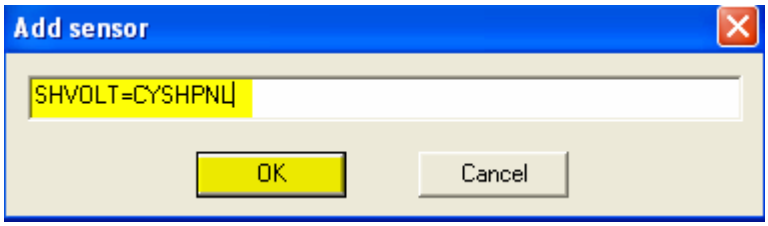


FIG: 21.4 Add Sensor

Shooting Voltage sensor

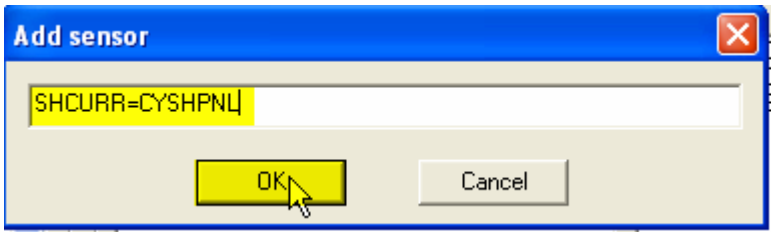


FIG: 21.5 Add second Sensor

Shooting Current sensor

Add sensor in order to acquire at the same time DEPTH and TIME versus Curves in the same Data Base.
Double check the ADPTH = AUX is under sensor.
Set the Data base for two outputs (Time and Depth)
TimeToDepthInputSec = (seconds per time sample), e.g. 0.10
TimeToDepthOutputFt = (feet per depth sample), e.g. 0.25

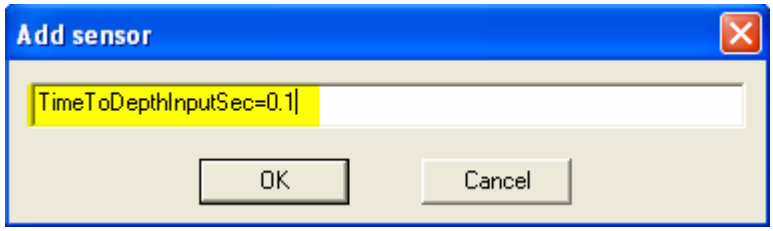


FIG: 21.6 Add Time to convert to Depth Input
Set the File Time with sample rate every 0.1 Sec, for high resolution for low resolution increase the sample rate Time.

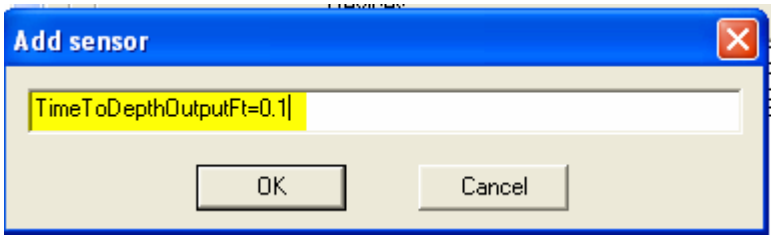


FIG: 21.7 Add Time to convert to Depth Output
Set the Depth File with sample rate every 0.1 Ft. for high resolution, for low resolution increase the sample rate to 0.25 FT.
Check the option Make this service available for perforating

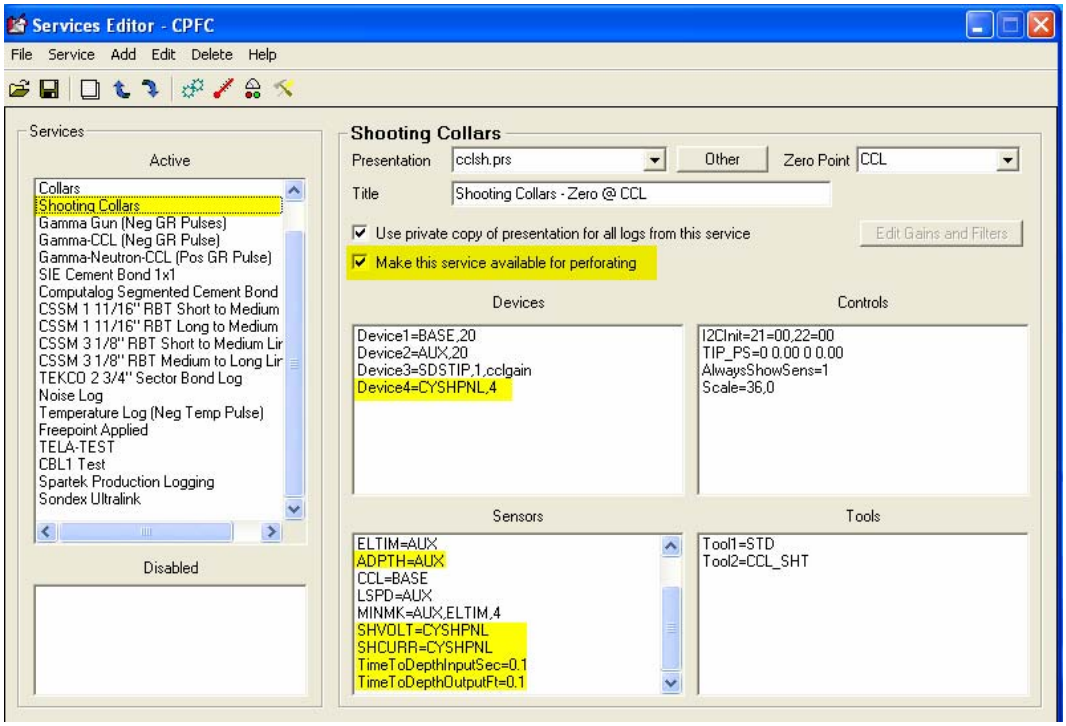


FIG: 21.6 Set Service

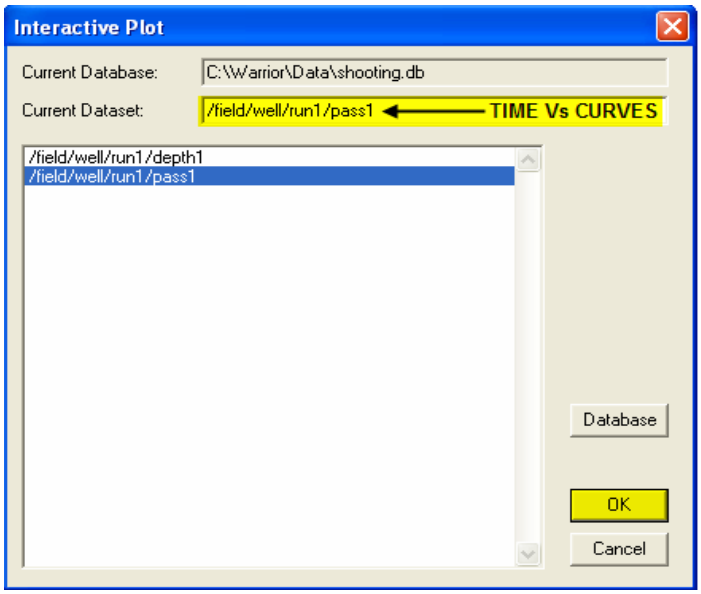


FIG: 21.7 Interactive Time Plot

Select the File Pass1 to plot Time Vs Curves

21.2 Time Plot

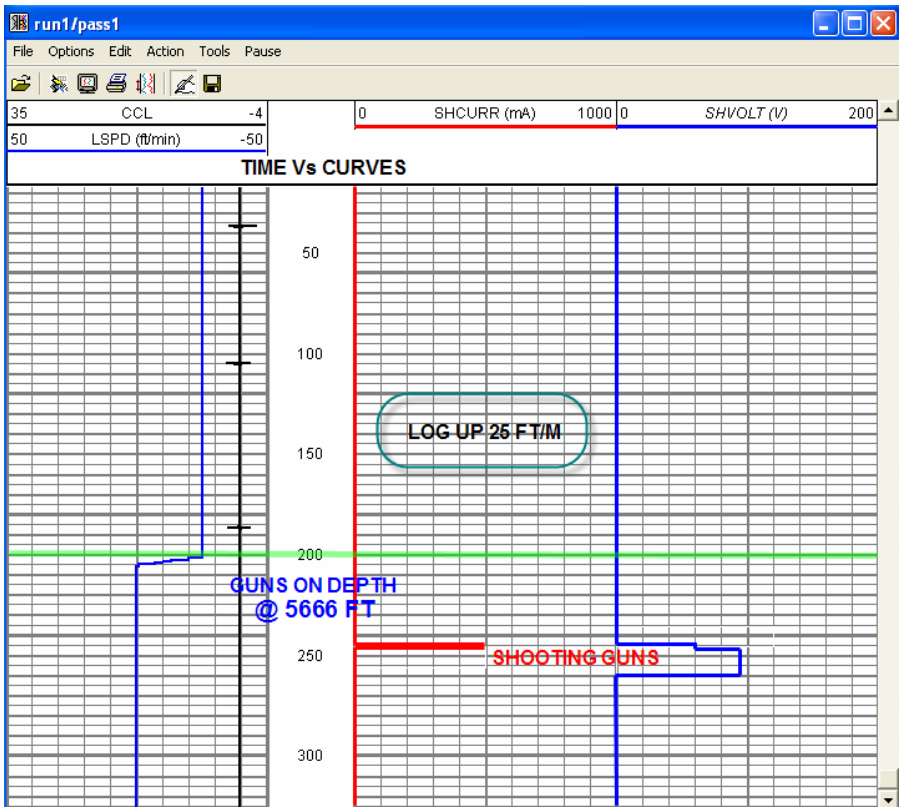


FIG: 21.8 Time Plot
The time plot is continues just depend of start acquisition (Record Up, Record Down, Record Time)

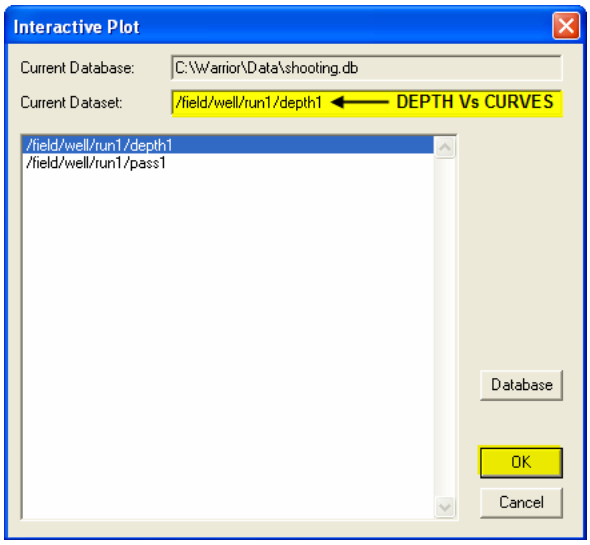


FIG: 21.9 Depth Plot

The Depth is the standard plot Depth Vs curves if the you stop the tool the plot stop to acquire data.

21.3 Depth Plot

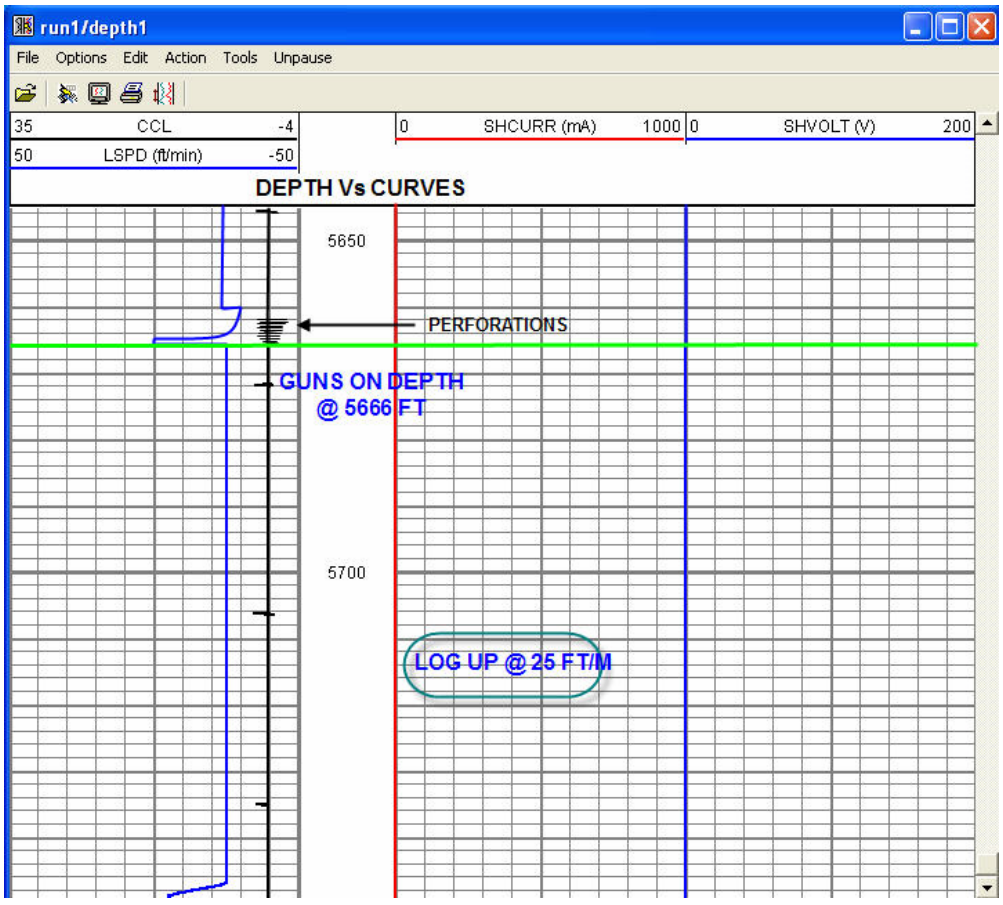


FIG: 21.10 Depth Plot

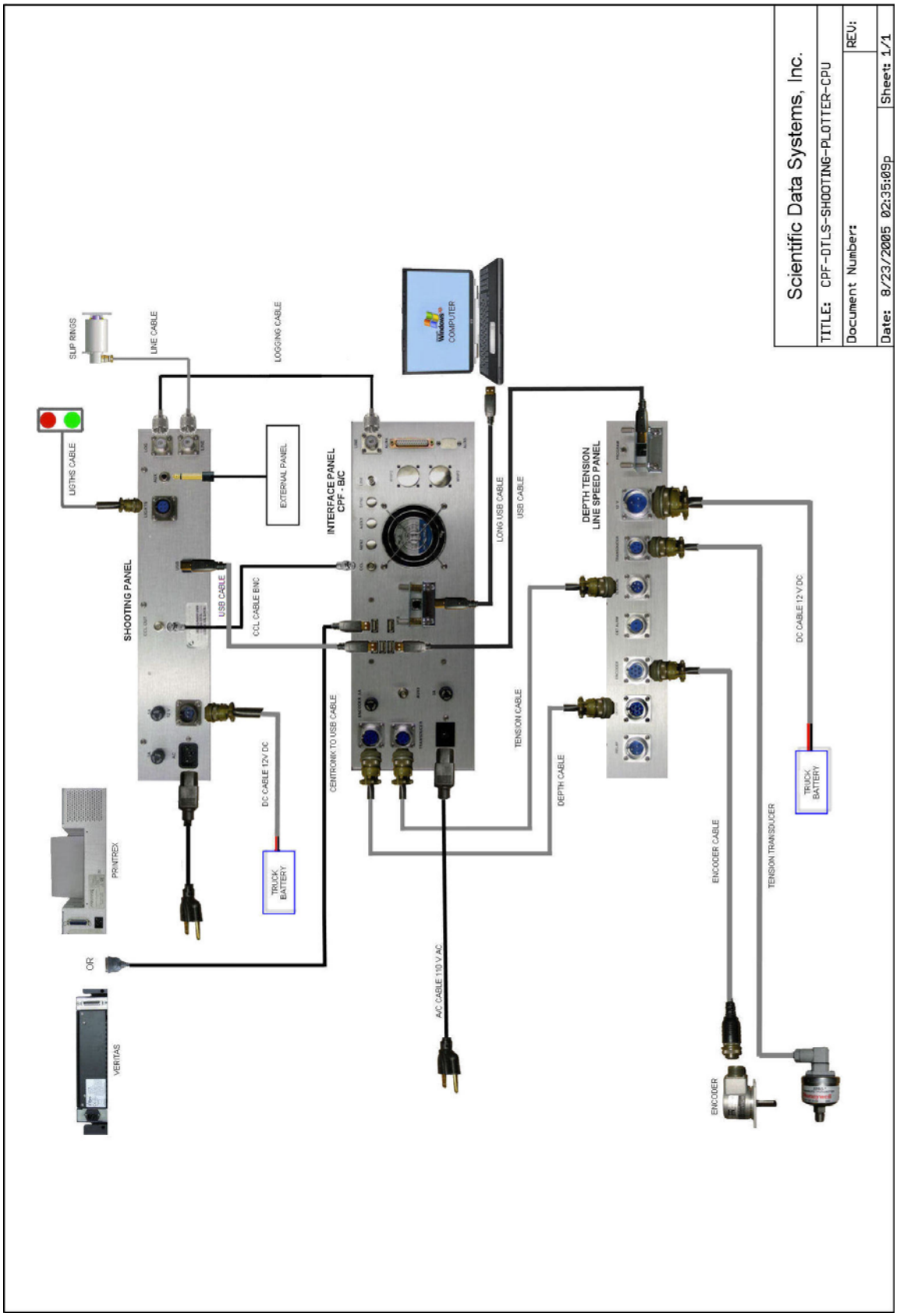


FIG: 21.11 Panels Connection

21.4 Shooting Panel Calibration

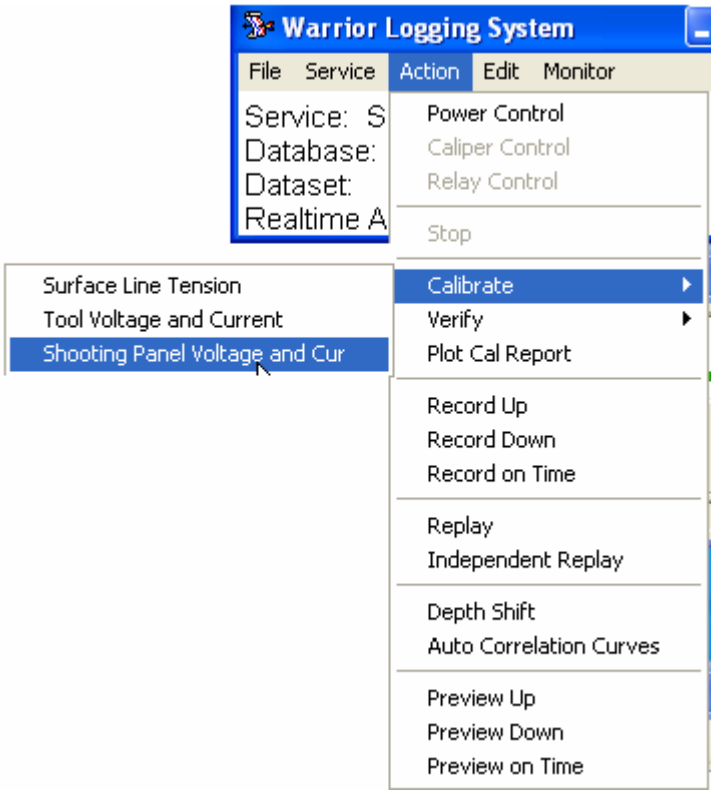


FIG: 21.12 Shooting Panel Calibration

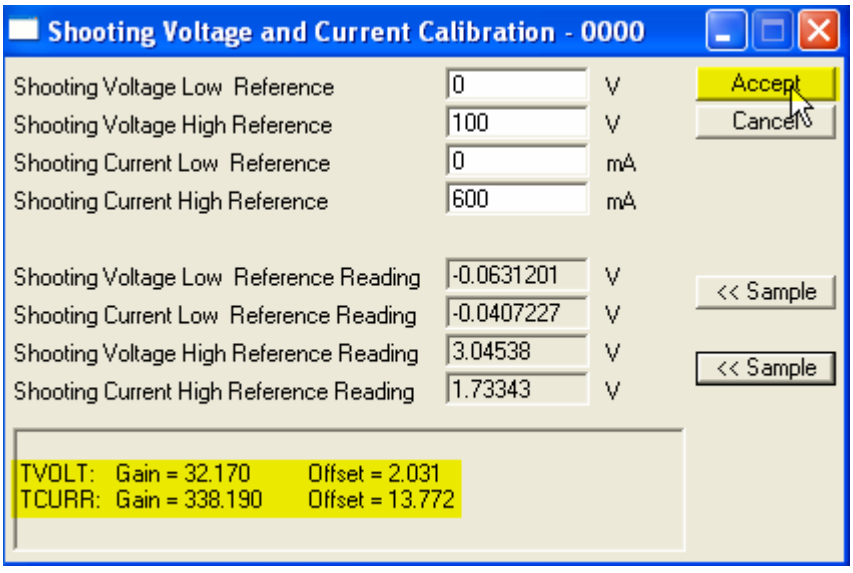


FIG: 21.13 Voltage and Current Calibration

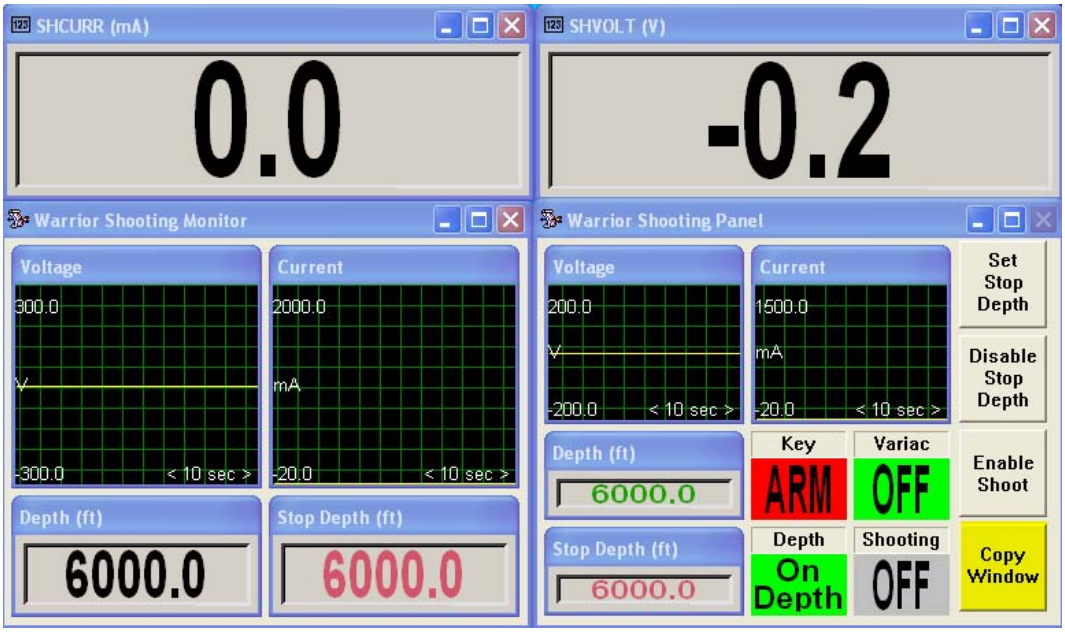


FIG: 21.14 Voltage and Current Values

21.5 Operation of the Shooting Panel

The speaker will emit a continuous WARNING tone while the **AC / DC** switch is in the AC position. The **'LOG'** and **'AUX'** positions on the **'MODE'** switch are active when the shooting panel is not powered. If the **'MODE'** switch is set to the **'LOG'** position, the **'LOG' and 'LINE'** connectors on the rear of the panel are connected.

21.5.1 AUX Position

Place Switch in Aux Position

The '**AUX'** key switch position simply connects the AUX connector to the line connector on the rear of the panel.

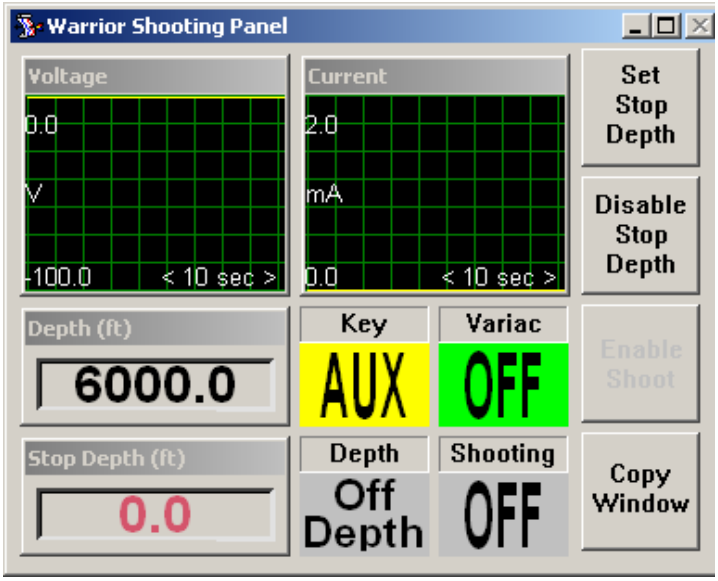


FIG: 21.15 Switch in AUX

21.5.2 LOG Position

Place Switch in LOG Position

To **log**, set the **'MODE'** key switch to **'LOG'**. The **'SAFE LIGHT'** connector on the back of the panel will have pins A & C shorted for a **UNSAFE** 'red light' to be illuminated on the rear of the logging truck.

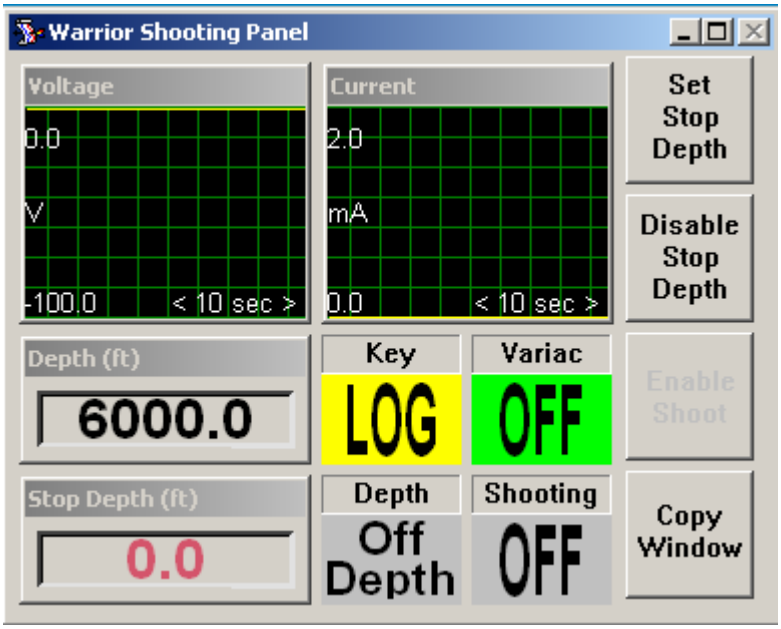


FIG: 21.16 Switch in LOG

21.5.3 SAFE Position

Place Switch in SAFE Position

The panel is in **'SAFE'** mode (line is shunted) any time the 'MODE' key switch is in the 'SAFE' position. The **'LIGHTS'** connector on the rear of the panel will have pins A & C shorted for a **SAFE** 'green light' to be illuminated on the rear of the logging truck. If the **'MODE'** switch is in any other position, pins A & B of the **'LIGHTS'** connector are shorted to indicate an unsafe **CONDITION**.

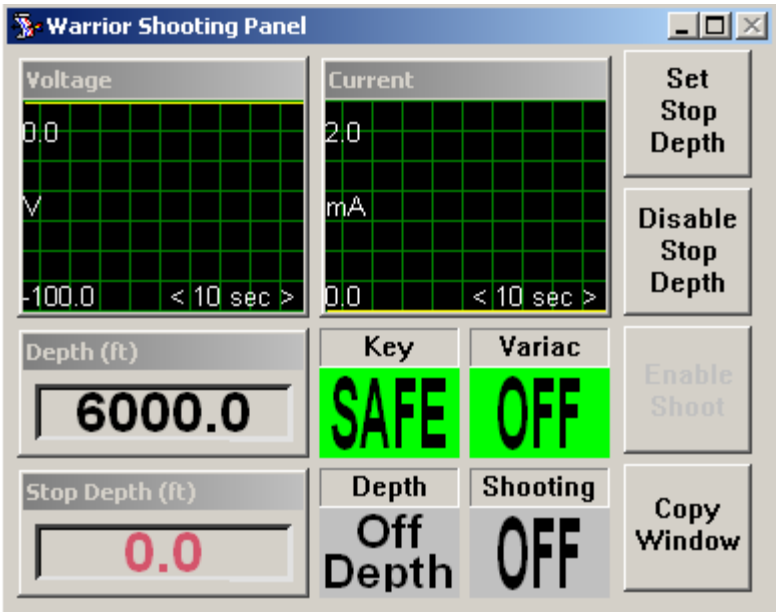


FIG: 21.17 Switch in SAFE

21.5.4 CCL Position

Place Switch in CCL Position

To log **CCL**, set the '**MODE'** key switch to '**CCL'.** The CCL amplifier is now connected to the line. The **'CCL GAIN'** control adjusts the relative reading of the **'CCL'** meter and the **'VOLUME'** control adjusts the volume of a speaker inside the panel that emits a chirp when a collar is detected. The CCL amplifier will function when the power plant is shut off as long as the **'MAIN'** switch is on.

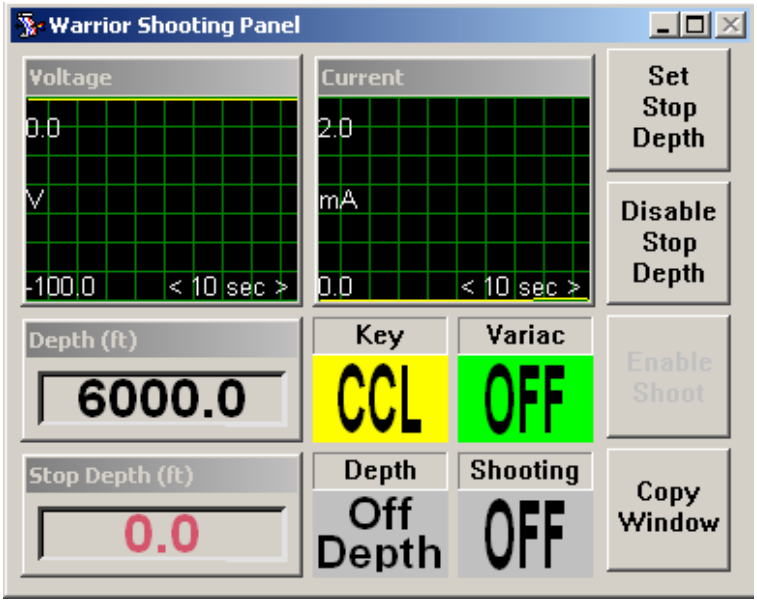


FIG: 21.18 Switch in CCL

21.5.5 ARM Position

Place Switch in CCL Position

To **arm** the panel, set the **'MODE'** key switch to **'ARM'**. The **'SAFE LIGHT'** connector on the back of the panel will have pins A & C shorted for a **UNSAFE** 'red light' to be illuminated on the rear of the logging truck.

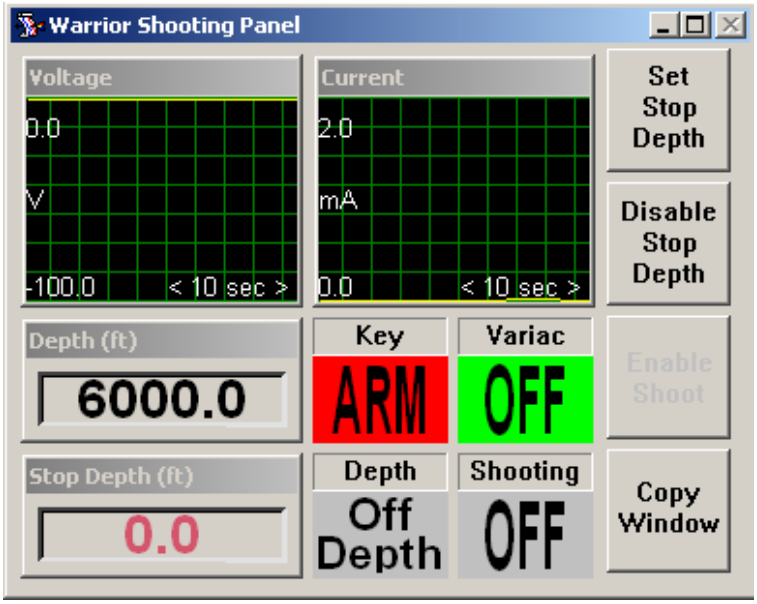


FIG: 21.19 Switch in ARM

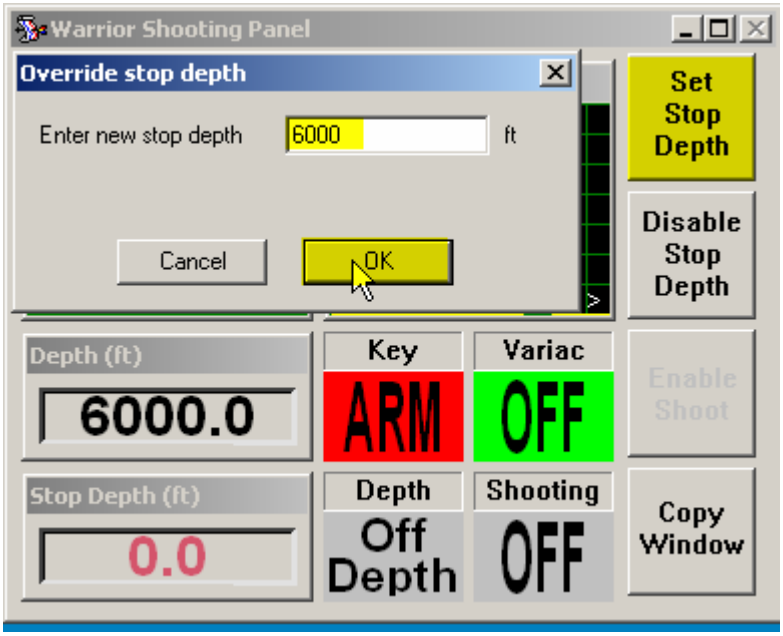


FIG: 21.20 Set Stop Depth

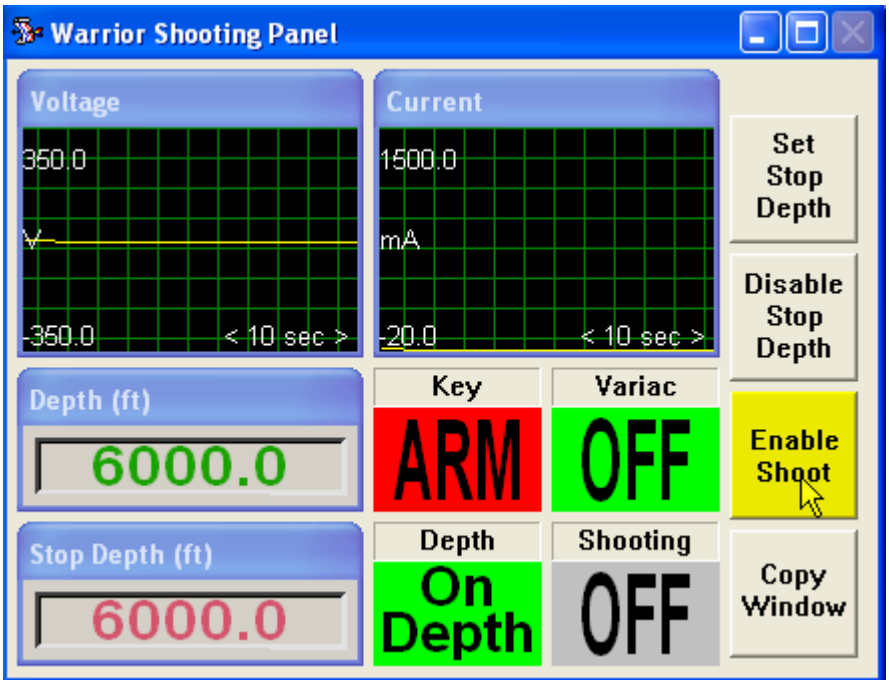


FIG: 21.21 Set Enable Shoot

Click over **Enable Shoot**

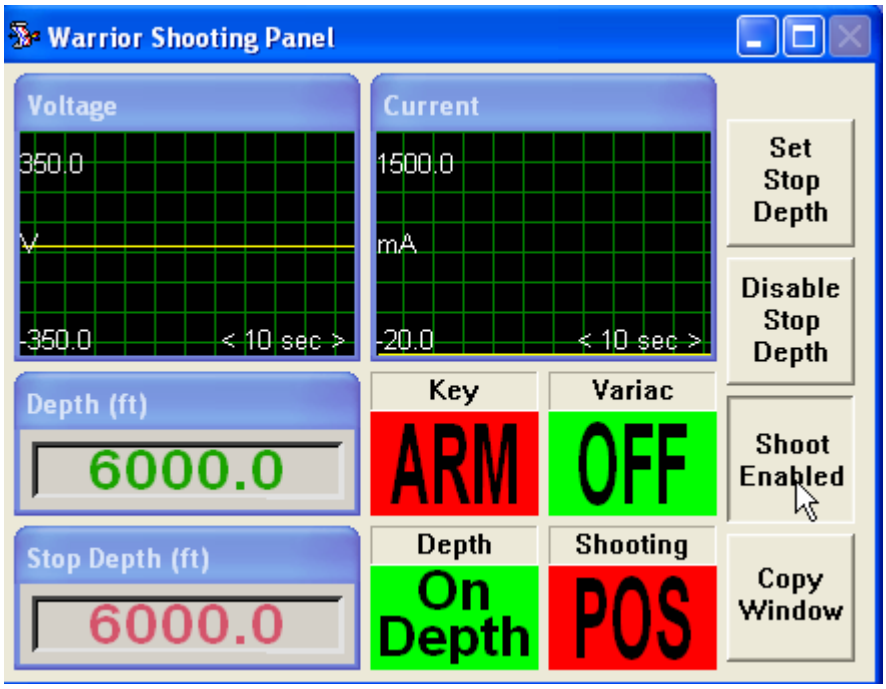


FIG: 21.22 Software Ready to Shooting

Ready to shooting

To **shoot**, verify that the **'MODE'** key switch is set to **'ARM'** and the **'ADJUST VOLTAGE'** control is rotated fully counter clock wise. Set the **'AC / DC'** switch the and the **'POS / NEG'** switch to the required settings (NOTE: the 'POS / NEG' switch has no effect when the 'AC / DC switch is in the AC position.) The panel is now ready to shoot. Lift and hold the **'SHOOT'** switch up and rotate the **'ADJUST VOLTAGE'** control clock wise while watching the **'VOLTAGE'** and **'CURRENT'** meters.

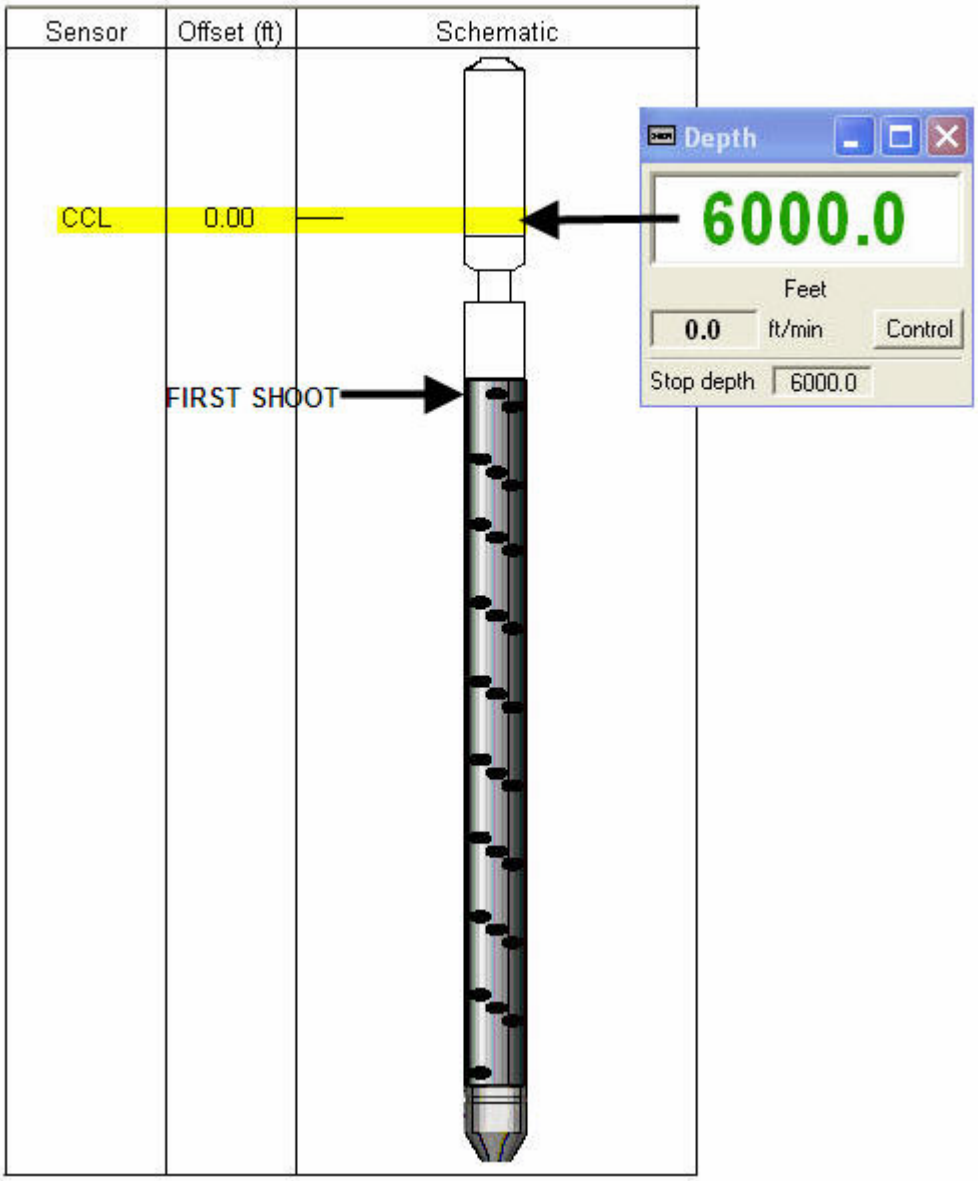


FIG: 21.23 CCL on Depth

Tool on Depth CCL Reference

FIG: 21.24 Positive Voltage and Current Shooting

Set Switch in Positive position

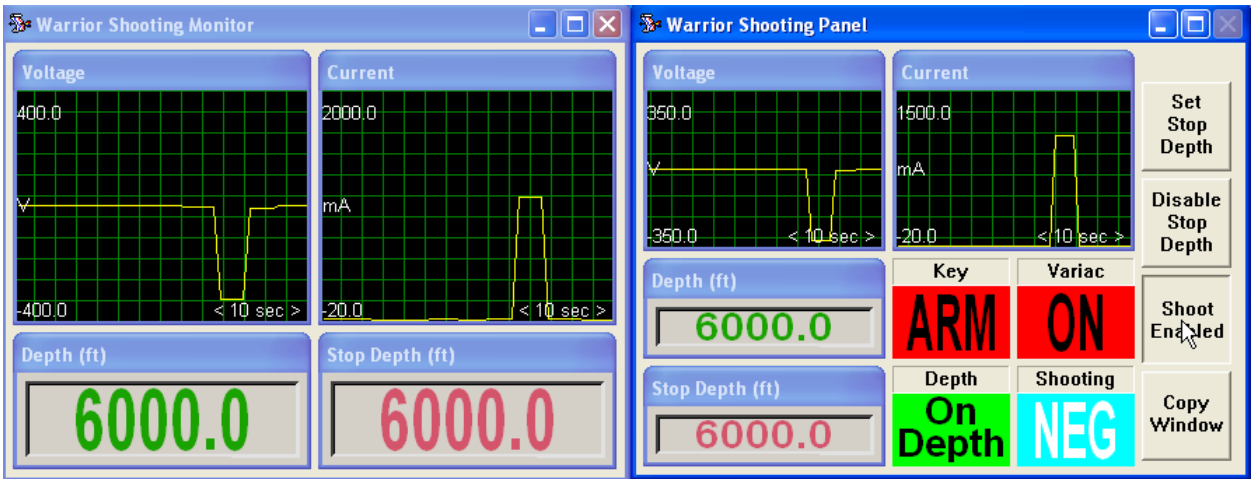


FIG: 21.25 Negative Voltage and Current Shooting

Set Switch in Negative position

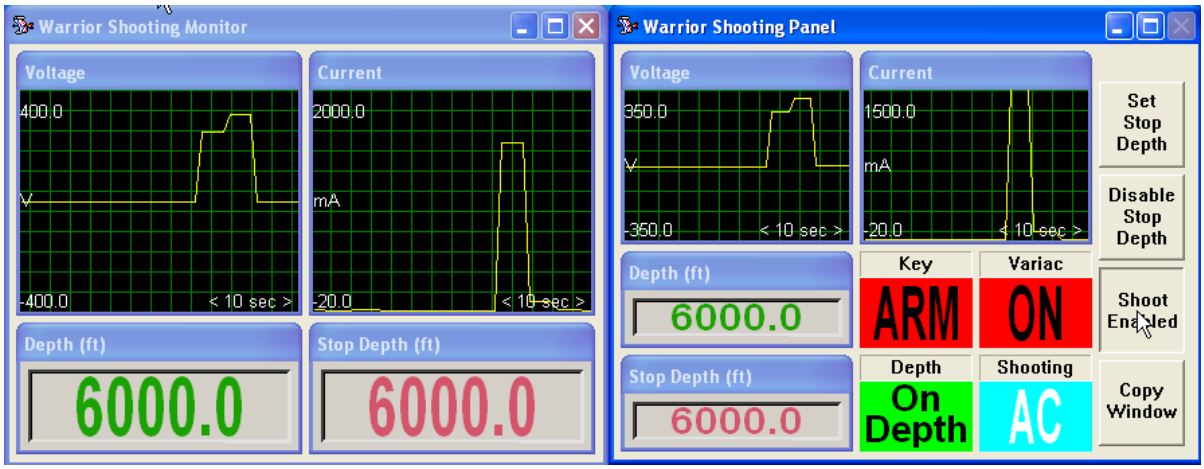


FIG: 21.26 Voltage and Current Shooting
Set Switch in AC position

VIDEO: 21.1 Shooting Procedure

Section

22

22 Convert from 6.2 to 7.0 Warrior

Goto Warrior system with 6.2 version, open Warrior and copy the 6.2 bin file unto a blank CD
Put CD in the cd driver of the computer that will be upgraded.
Copy the 6.2 bin file unto the desktop.

FIG: 22.1 Bin

22.1 Procedure

- Place the 6.2 Bin file on the desktop...
- Open My Computer\C:\Warrior folder
- Open the 6.2 Bin file that you placed on the desktop.
- Copy all of the ".wtd" files from the 6.2 bin folder to Warrior \ Format folder
- Copy all of the ".was" files from the6.2 bin folder to Warrior \ 7.0 bin32 folder
- Copy all of the ".hdg" files from 6.2 Bin folder to Warrior \ Format Folder
- Copy all of the ".prs" files from 6.2 Bin folder to Warrior \ Format Folder
- Copy the Company logo file from 6.2 Bin to Warrior \ Config Folder
- Close all windows

22.2 Import a Tool

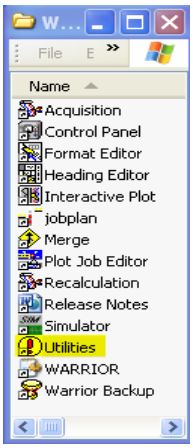


FIG: 22.2 Utilities

Open the 7.0 Warrior Utilities program.

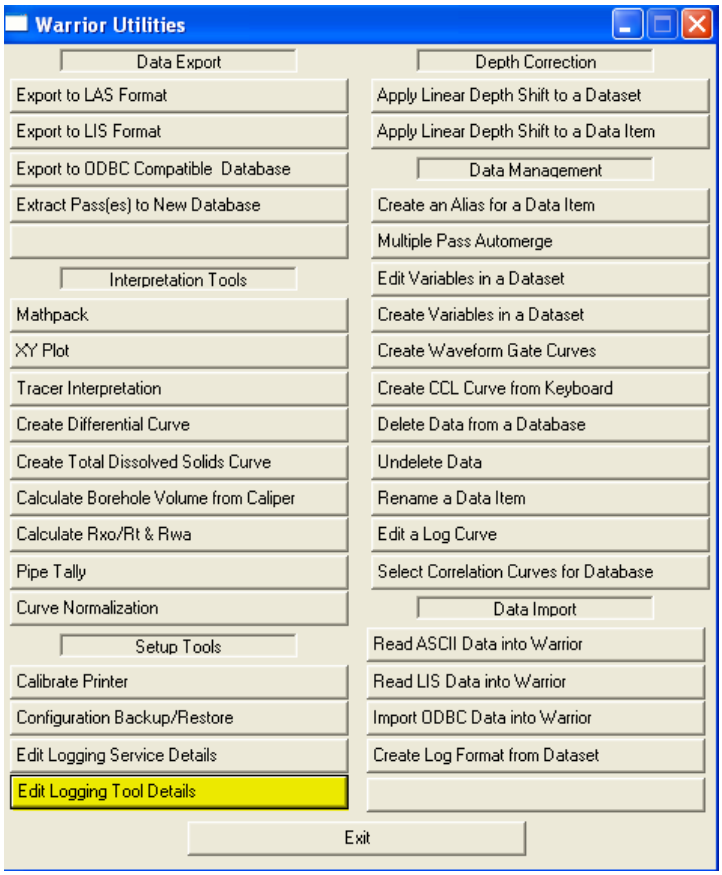


FIG: 22.3 Edit Logging Tool Details

Open "Edit Logging Tool Details.

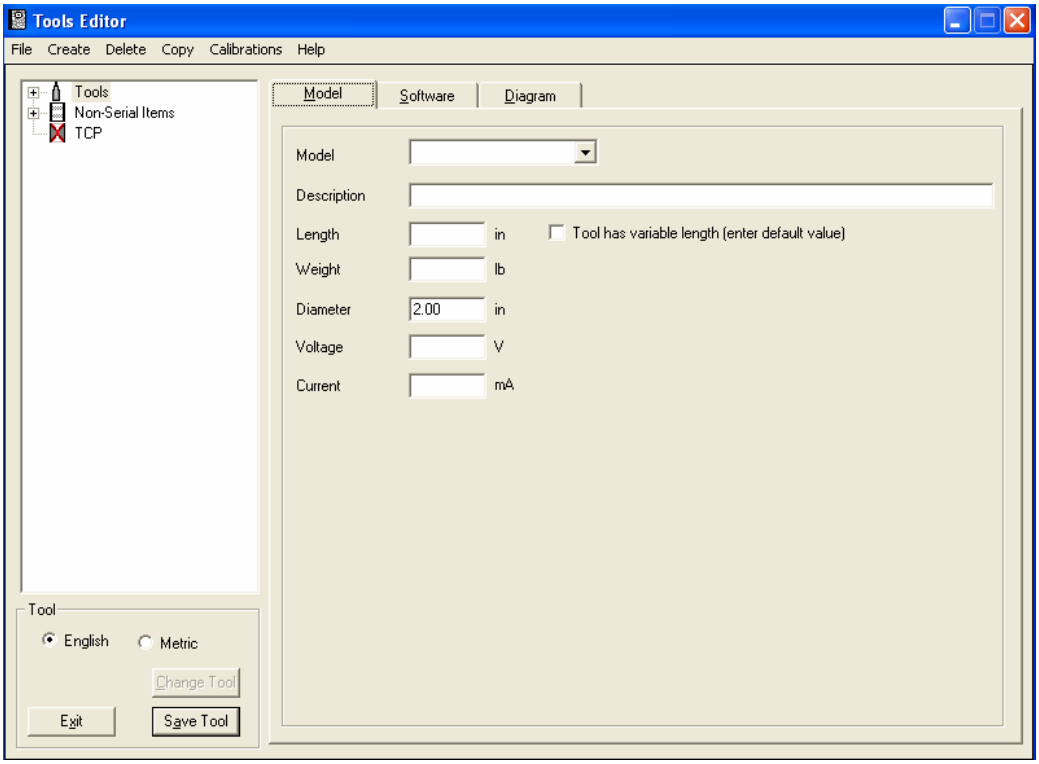


FIG: 22.4 Tools Editor

Highlight "Tools"

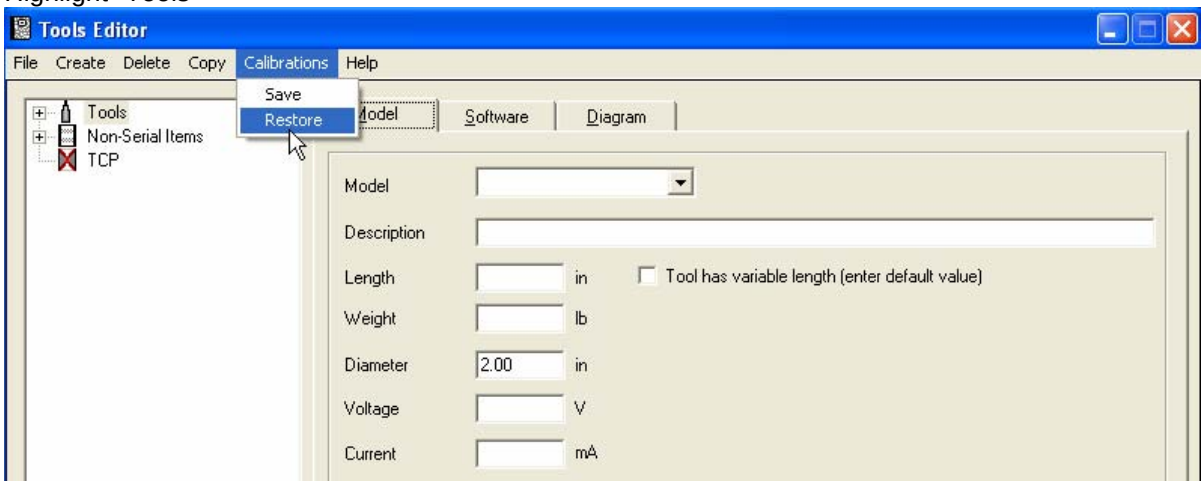


FIG: 22.5 Tools Restore

From the tools menu, select Calibrations --> Restore.

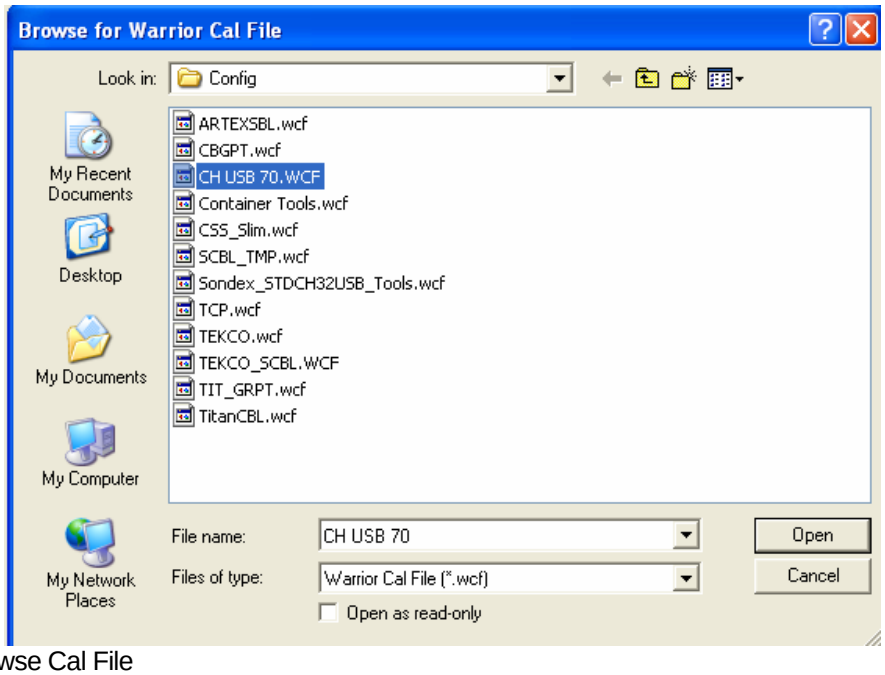


FIG: 22.6 Browse Cal File

In the box marked "Filename", change the .wcf to "*" and press enter.

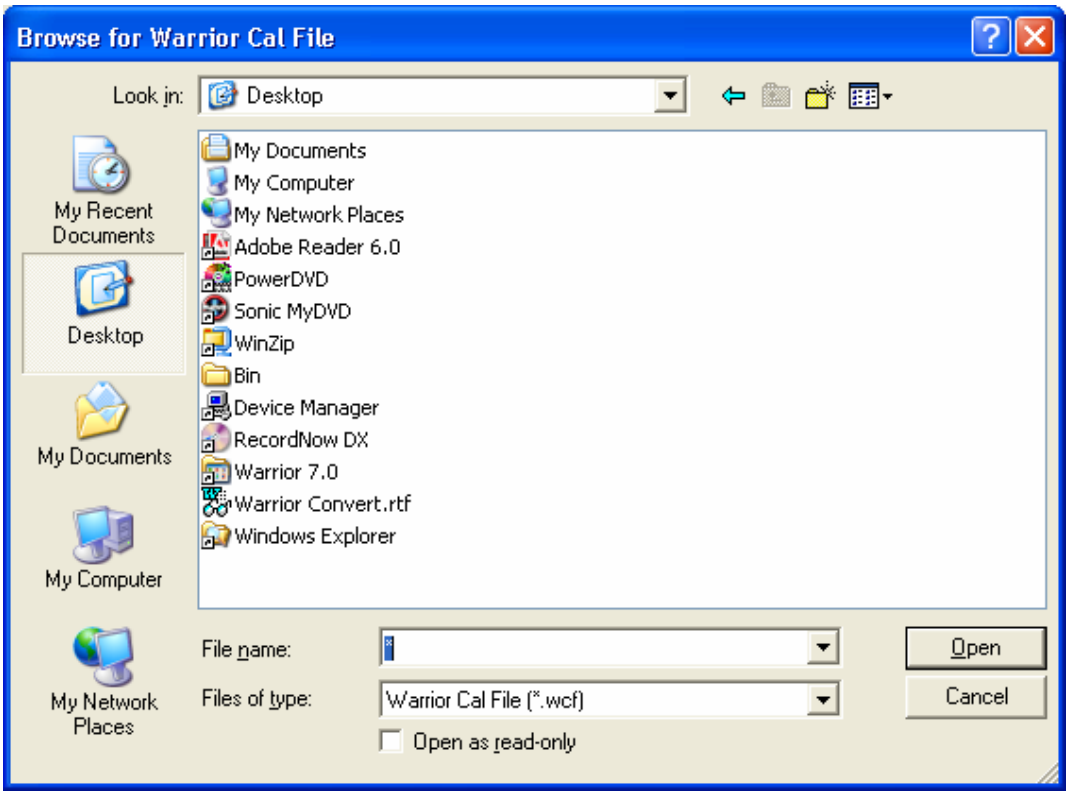


FIG: 22.7 Browse Cal File 6.2

Click on the Desktop icon to the left side of the window.
Double click on the 6.2 Bin folder.
Highlight "Tools.ini" file.

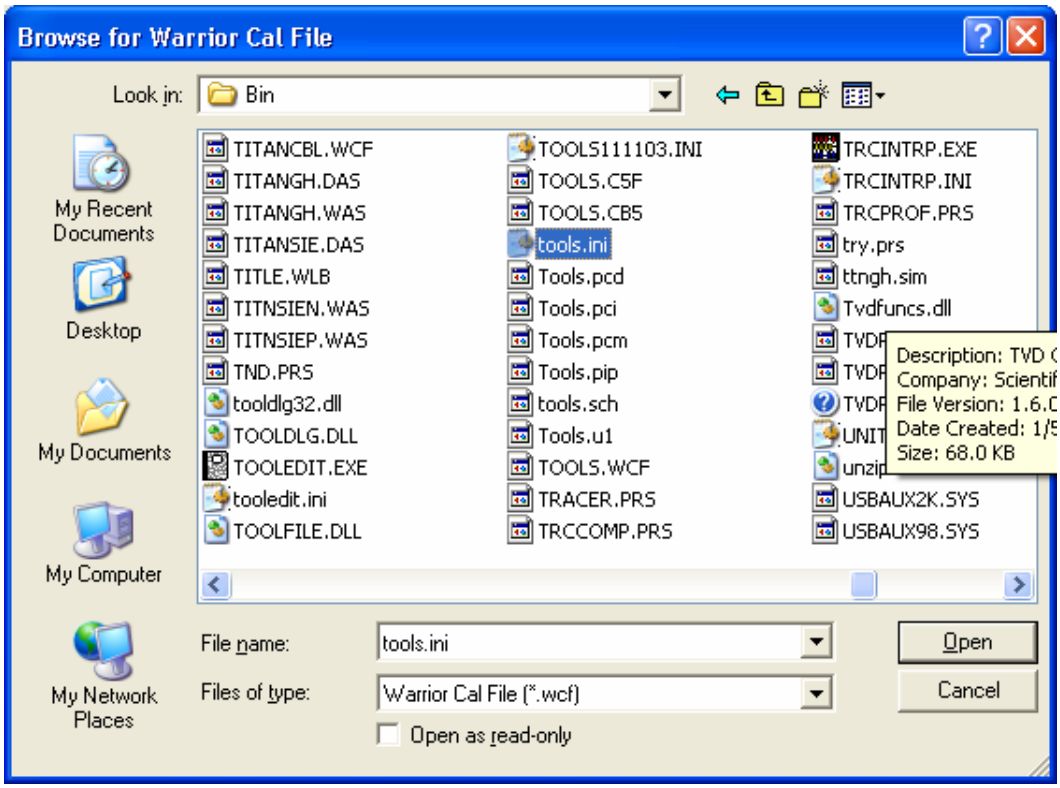


FIG: 22.8 Browse Cal File 6.2

Click on Open.

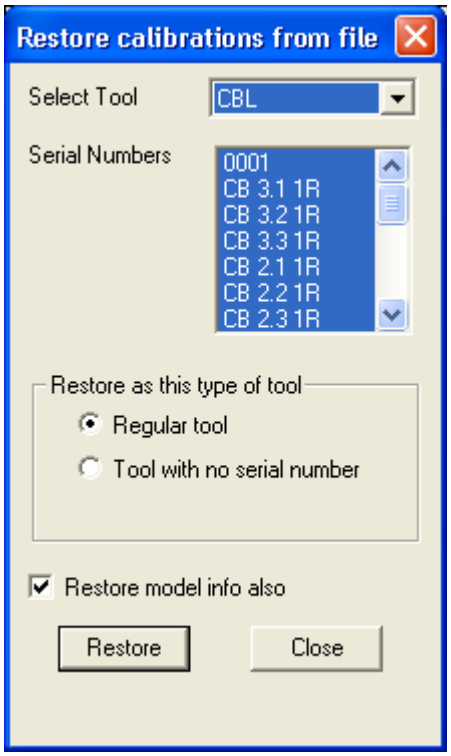


FIG: 22.9 Tools Restore

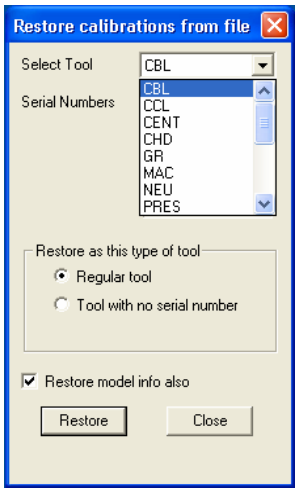


FIG: 22.10 Select Tools

From the Select Tool drop down menu, choose the tool type to be imported. Highlight all of the tools under the tool type that you wish to import into 7.0
NOTE: There are several categories of tools that can be selected.
Click on the "Restore" button.

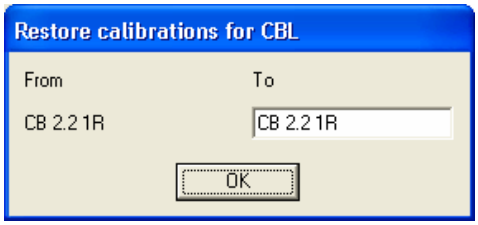


FIG: 22.11 Restore Calibrations

At this point, you can give the tool a different name if you are concerned about over writing original tool information. If you do not wish to rename the tool, click on OK.

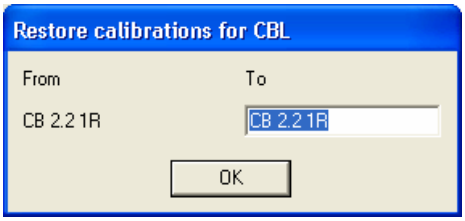


FIG: 22.12 Restore Calibrations

If you wish to rename the tool, highlight the name in the "To" box and then type in the name you desire.

FIG: 22.13 Restore Calibrations

Click on OK. The tool will be imported under the new name.

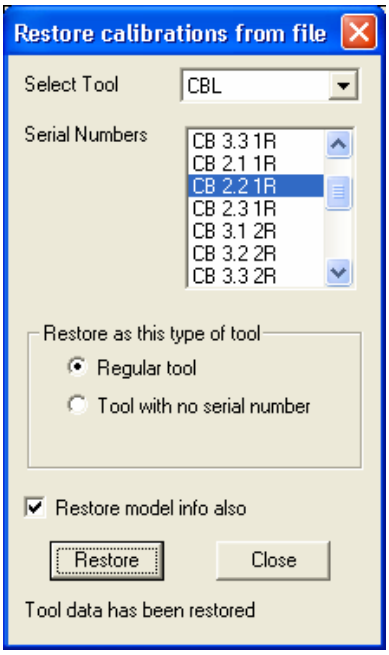


FIG: 22.11 Restore Calibrations

Close the restore window.

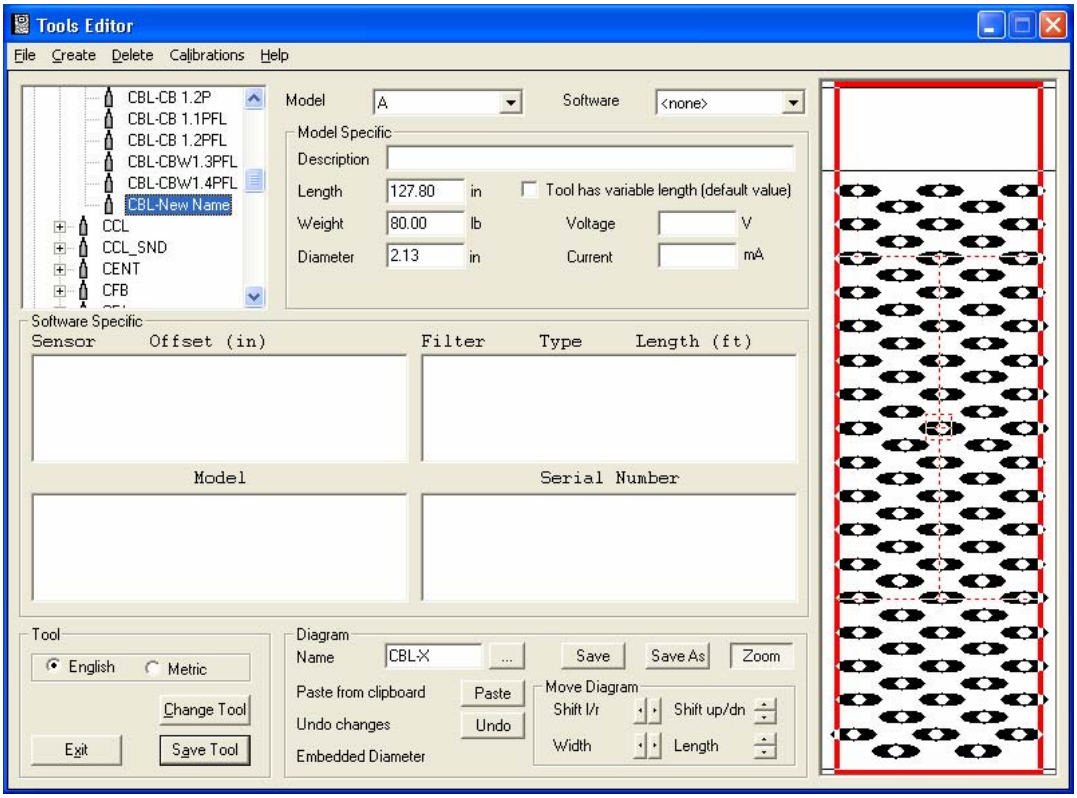


FIG: 22.12 Tool editor

You can now find your new tool in the list.
Repeat this for each tool category.
All tools are now available.
Close Tools Editor window.

22.3 Import a Service

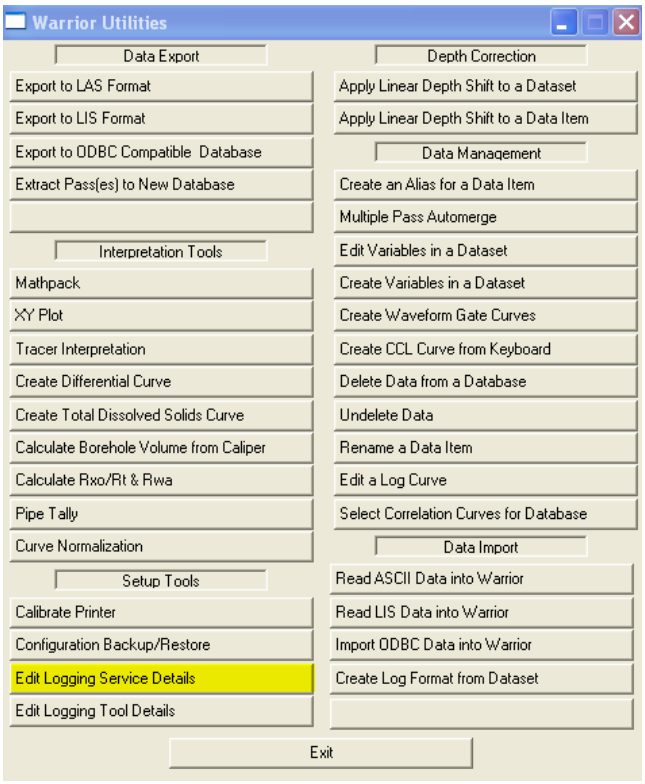


FIG: 22.13 Edit Logging details

In the 7.0 Warrior Utilities window, click on Edit Logging Service Details.

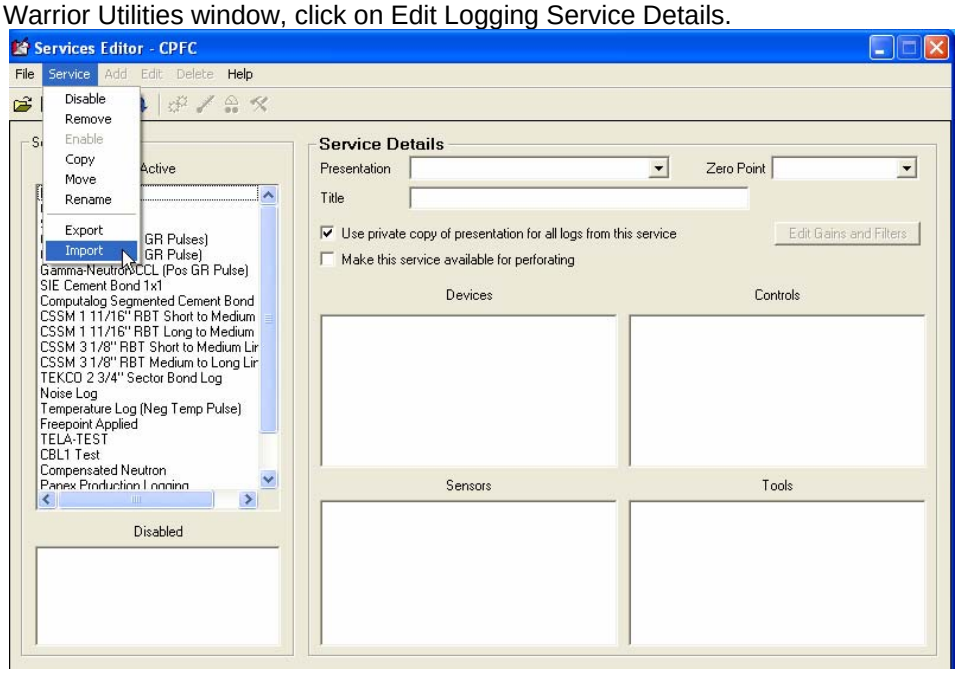


FIG: 22.14 Import service

From the tool menu, select Service --> Import

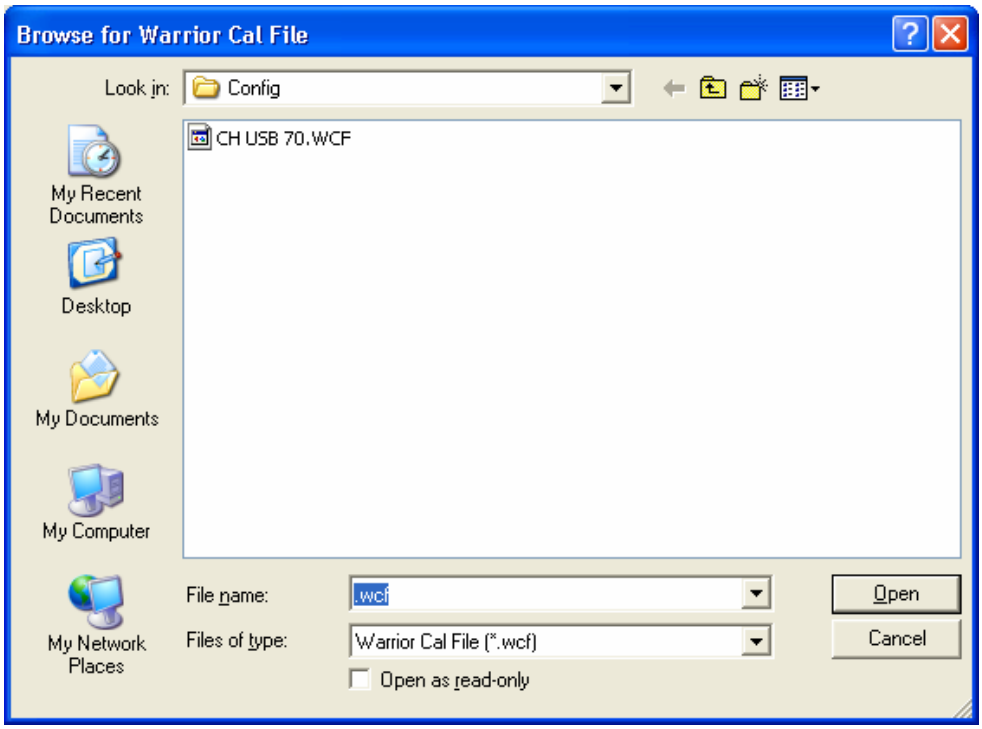


FIG: 22.16 Browse Cal File

In the box marked "FileName", change the .wcf to "*" and press enter.

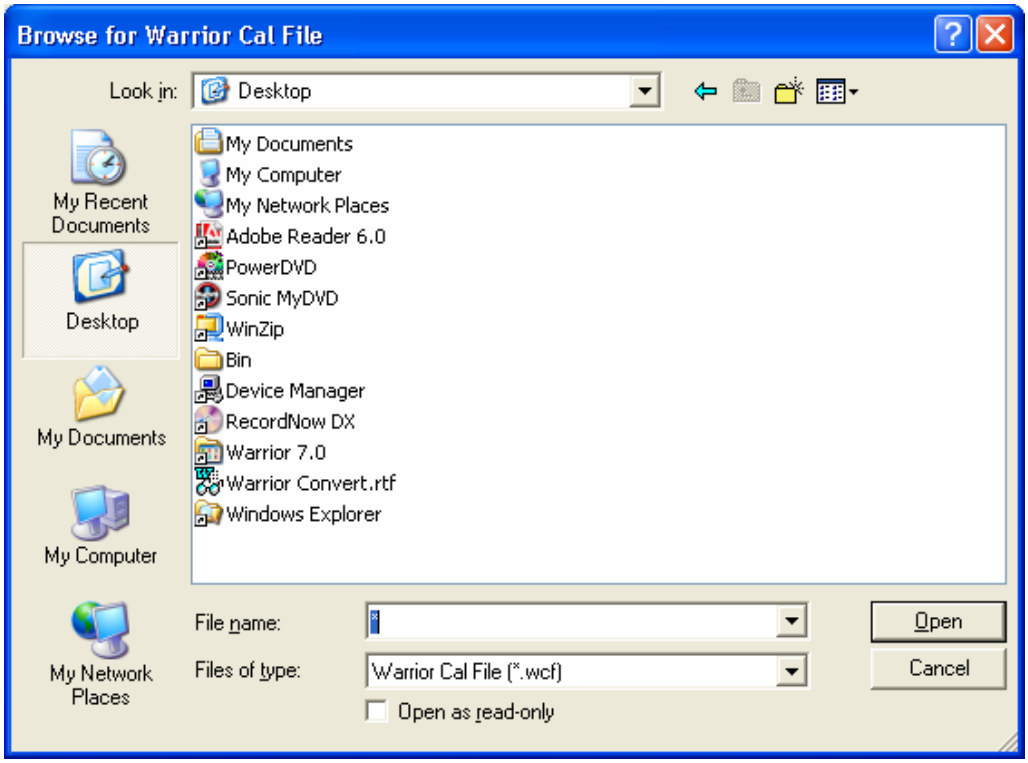


FIG: 22.17 Warrior Cal File versions 6.2

Click on the Desktop icon to the left side of the window.

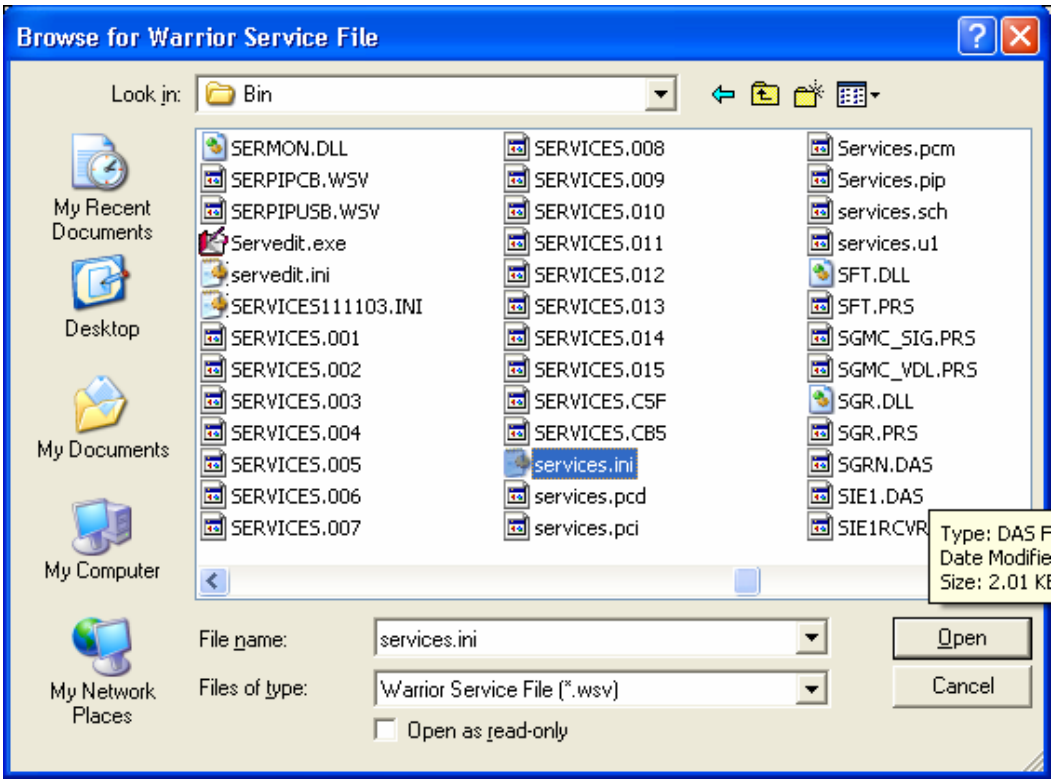


FIG: 22.18 Services.ini versions 6.2

Click on services.ini, click enter

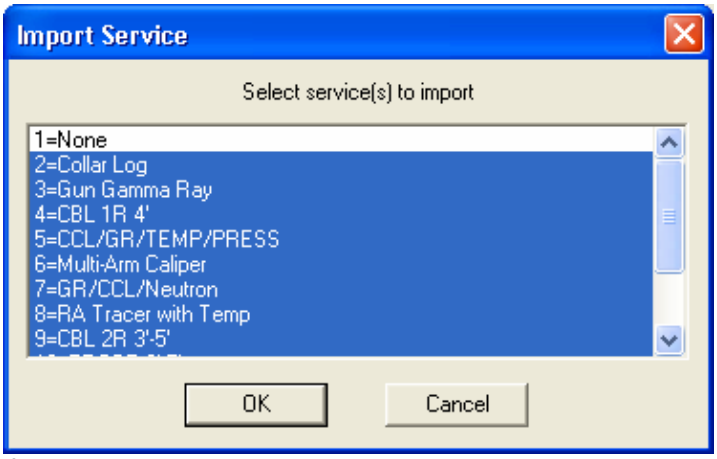


FIG: 22.19 Select services

Highlight all services to be imported and click ok

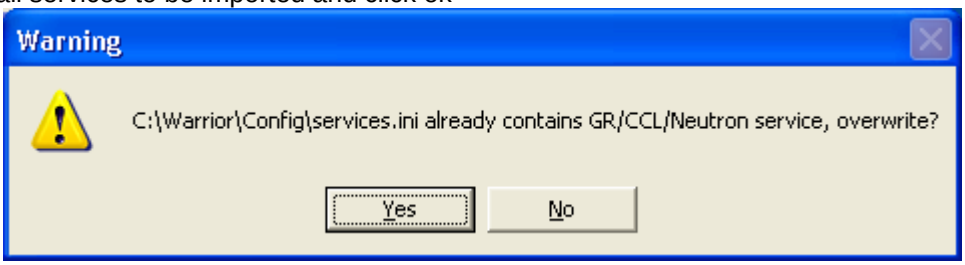


FIG: 22.20 Overwrite Select service

If there is a service with the same name, the program will ask if it should be over written. Keep in mind that any changes you have made to the original service (the one being over written) will be lost to import the service, click on OK.
If you do not want to loose the changes, click no. Follow the procedure to rename the original service below, and then return to "Import Service" procedure.

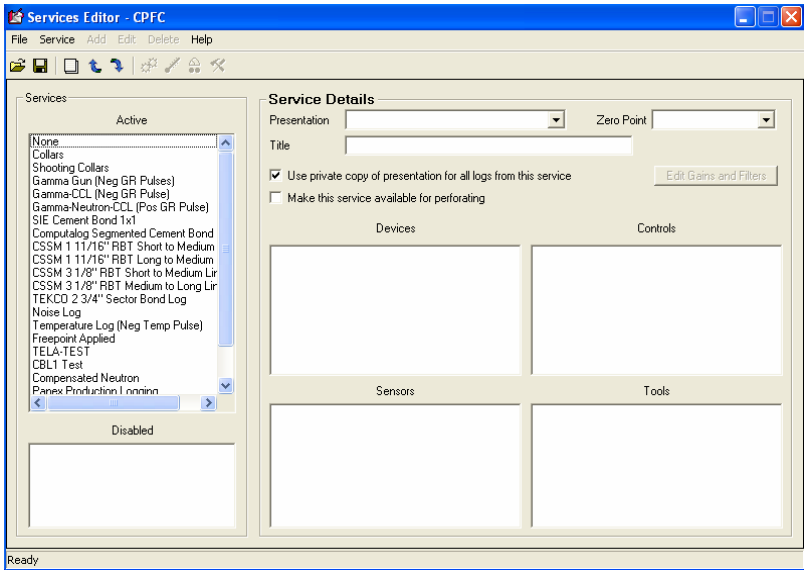


FIG: 22.21 Service Editor

All service that was selected has now been imported. You must now convert the imported services from 6.2 to 7.0
Close all windows.

22.4 Convert Services

Open My Computer\C:\Warrior folder
Open bin32 folder.

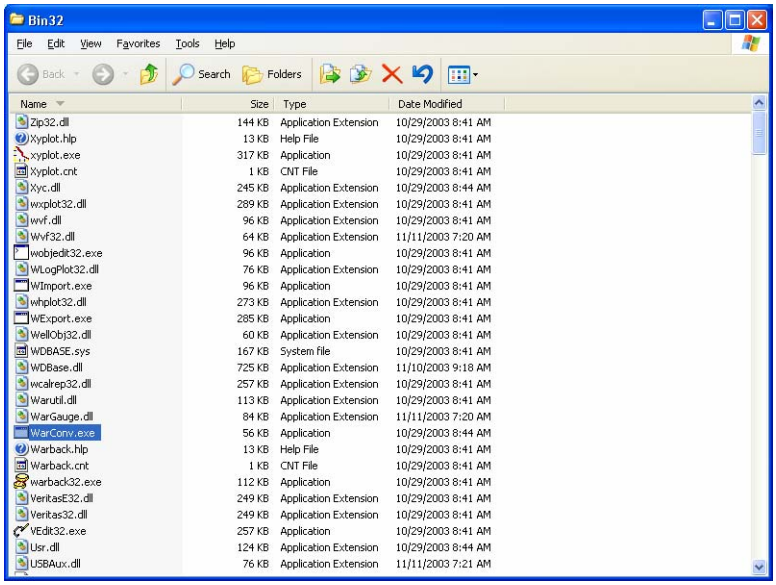


FIG: 22.22 WarConv.exe

Double click on warconv.exe

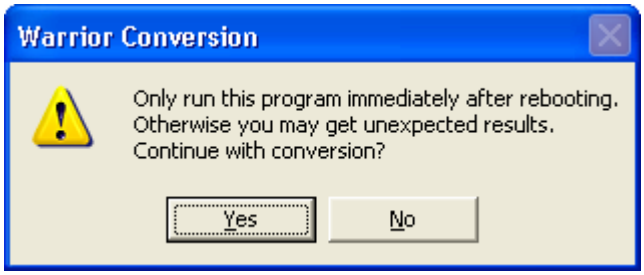


FIG: 22.23 Run WarConv.exe

Click on yes

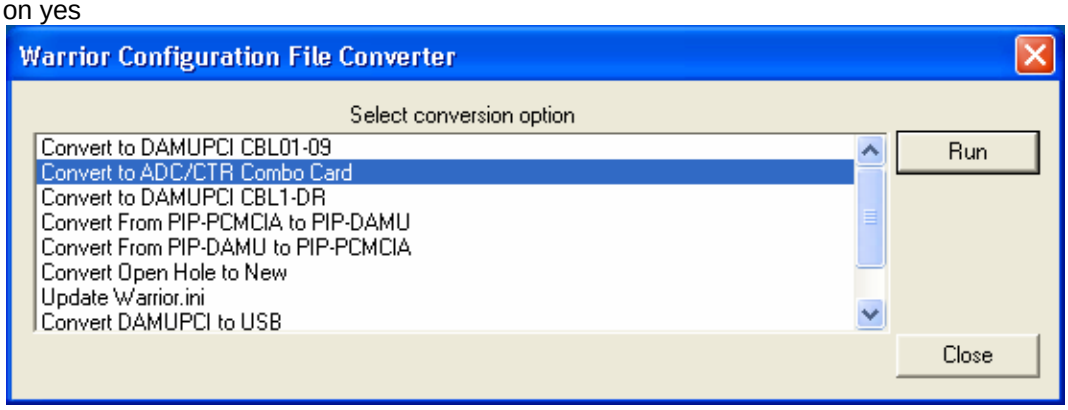


FIG: 22.24 Select Configuration File Converters

Highlight Convert to ADC/CTR Combo card then click Run.

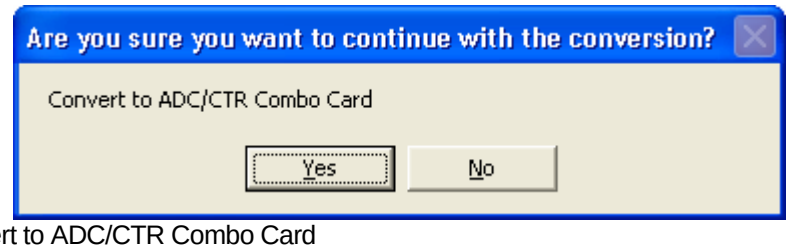


FIG: 22.25 Convert to ADC/CTR Combo Card

Click on Yes.

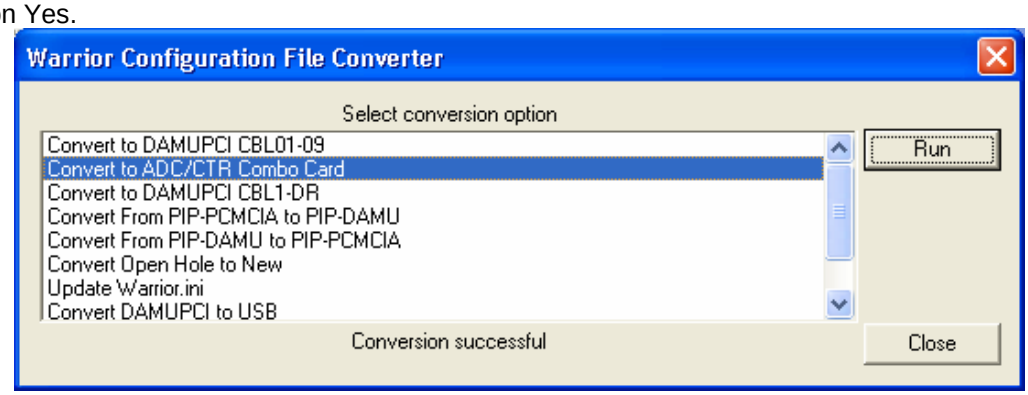


FIG: 22.26 Select Configuration File Converter

You will see "Conversion Successful" when the conversion is finished.
Restart your computer.
Again, open My Computer\C:\Warrior folder

Open bin32 folder.

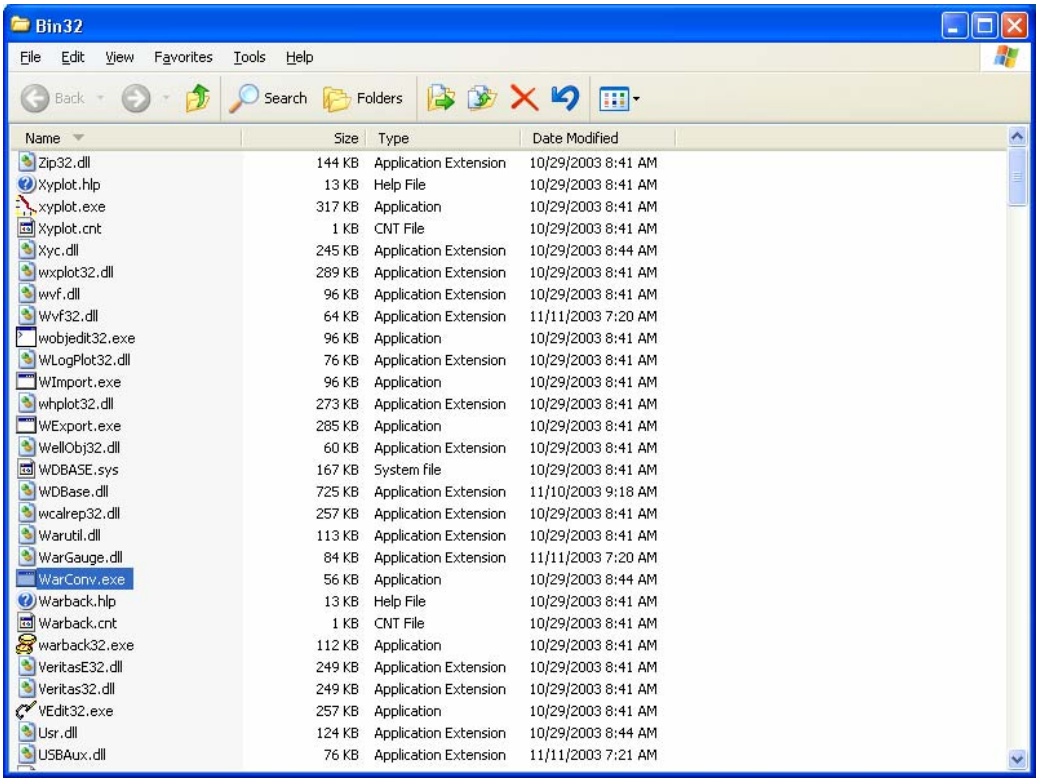


FIG: 22.27 WarConv.exe

Double click on warconv.exe

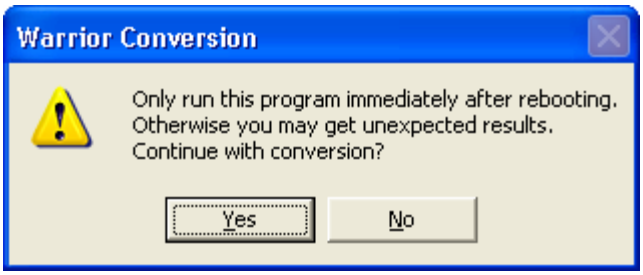


FIG: 22.28 Run WarConv.ex

Click on yes

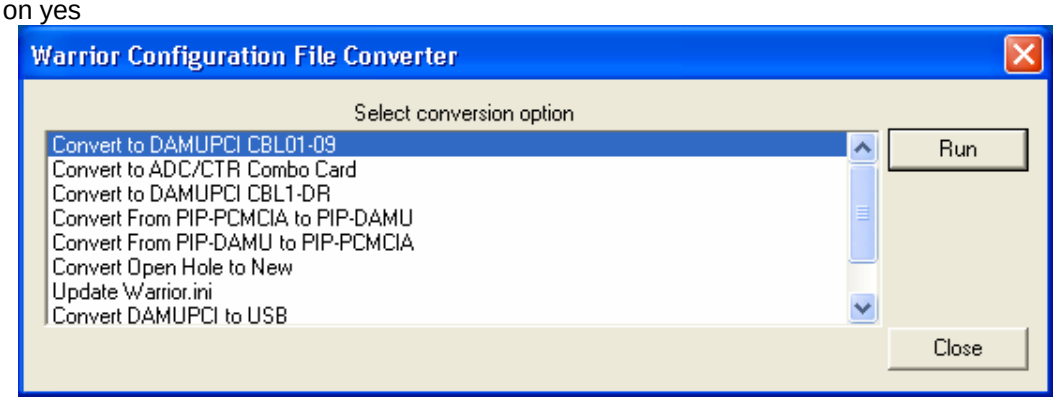


FIG: 22.29Warrior configuration File converter

Highlight Convert to DAMUPCI CBL01-09 then click on Run.

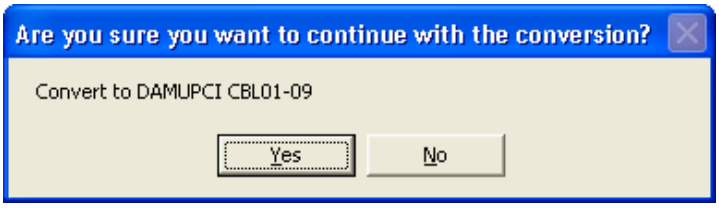


FIG: 22.30 Convert

Click on Yes.

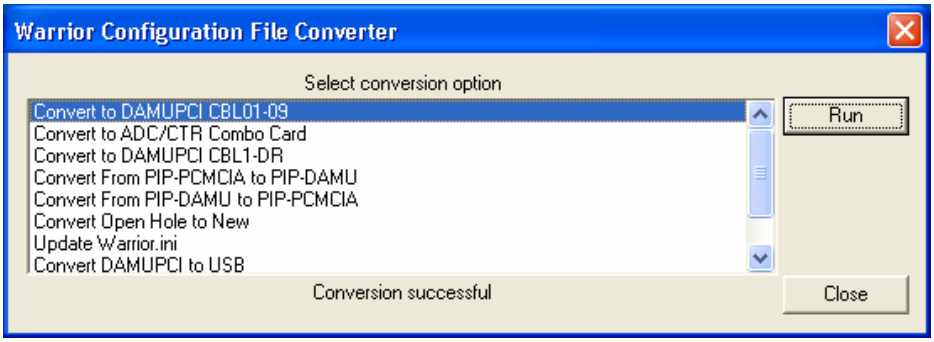


FIG: 22.31 Warrior Configuration File Converter

You will see "Conversion Successful" when the conversion is finished.
Restart your computer.
Again, open My Computer\C:\Warrior folder
Open bin32 folder.

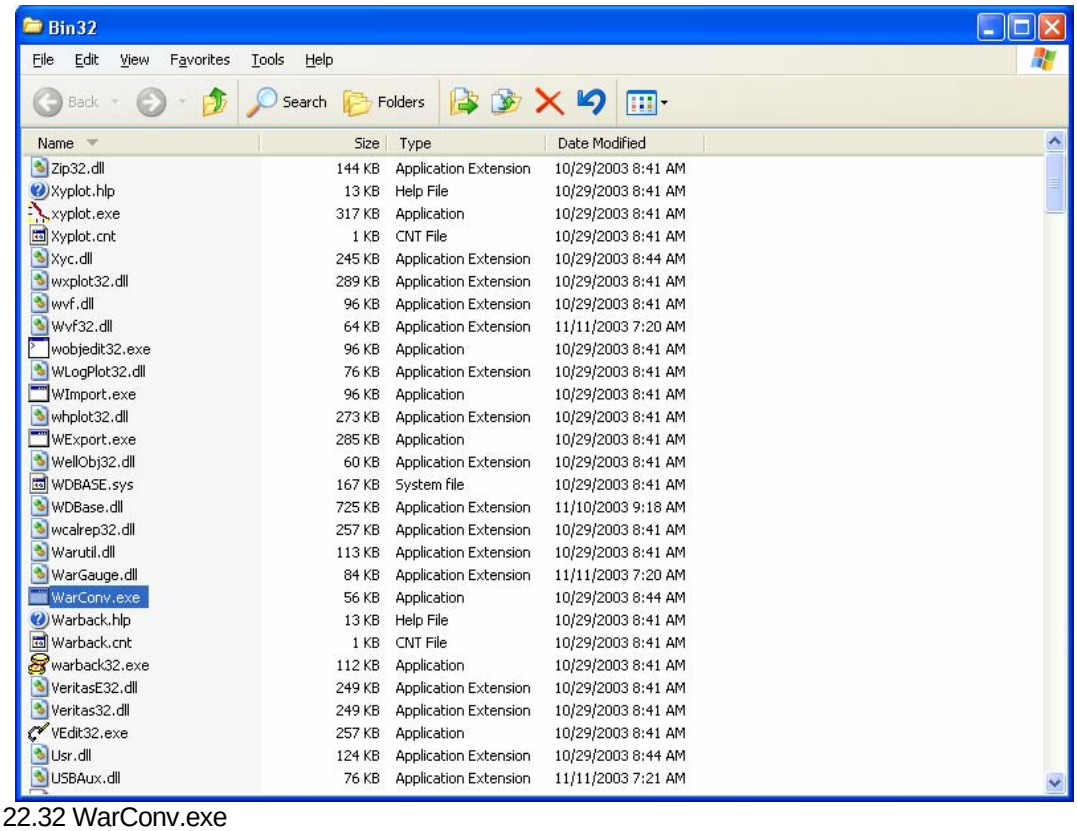


FIG: 22.32 WarConv.exe

Double click on warconv.exe

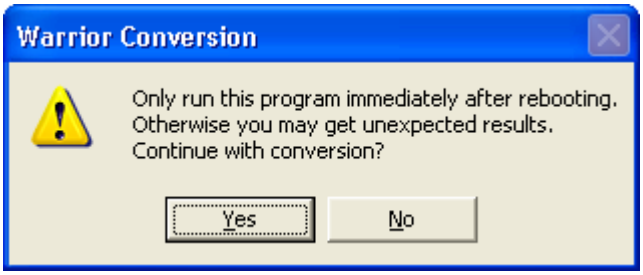


FIG: 22.33 Run Conversion

Click on yes

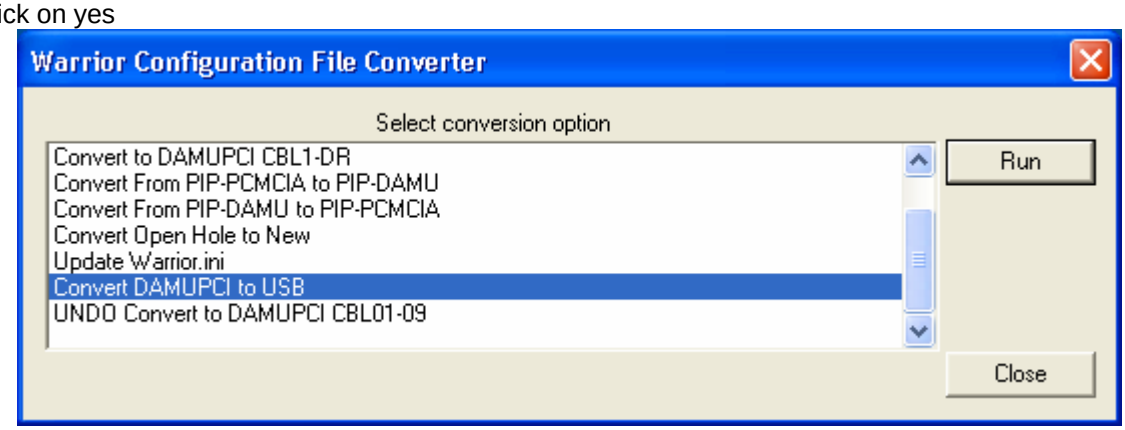


FIG: 22.34 Warrior Configuration File Converter

Highlight Convert DAMUPCI to USB then click on Run.

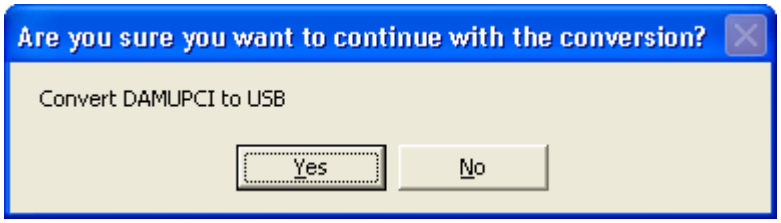


FIG: 22.35 Convert

Click on Yes.

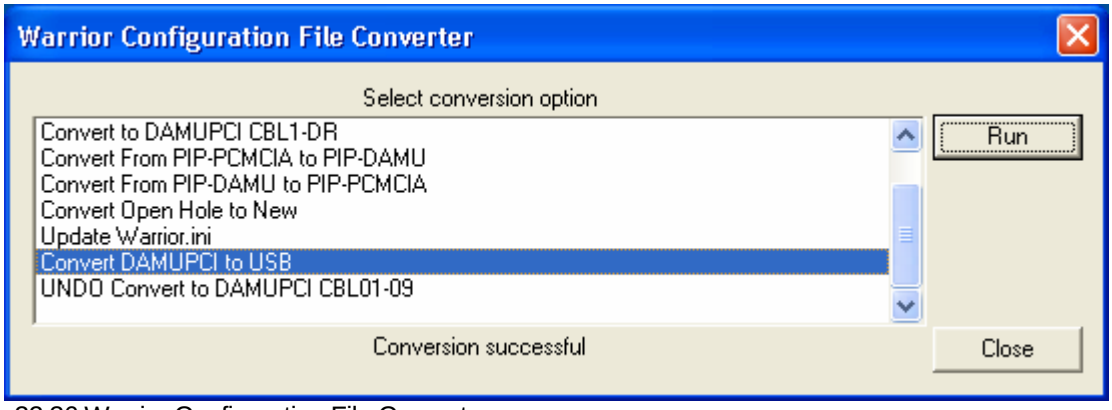


FIG: 22.36 Warrior Configuration File Converter

You will see "Conversion Successful" when the conversion is finished.
Restart your computer.

This ends the conversion process.

22.5 Rename Original Service

FIG: 22.37 Warrior Utilities

Open Utilities by clicking on the Utilities icon.

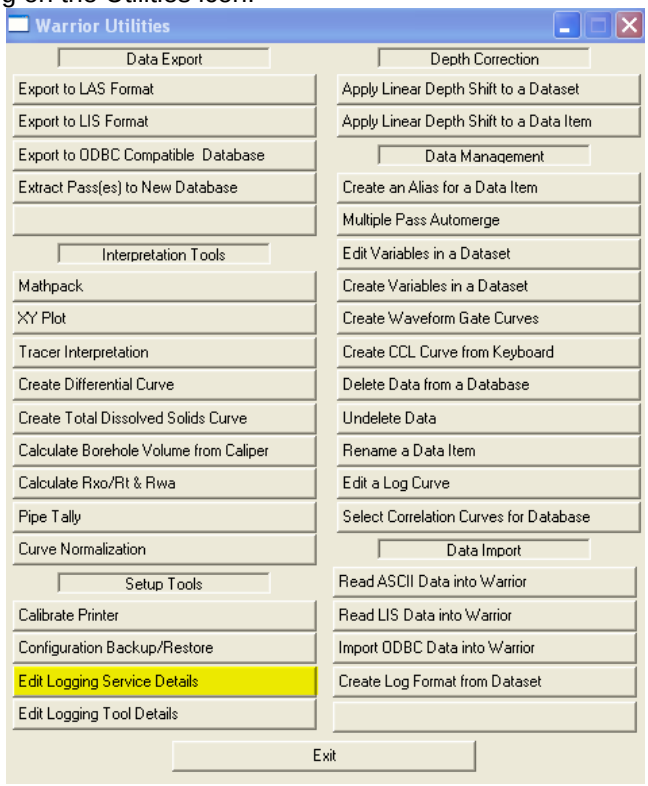


FIG: 22.38 Edit Logging details

Click on Edit Logging Service Details.

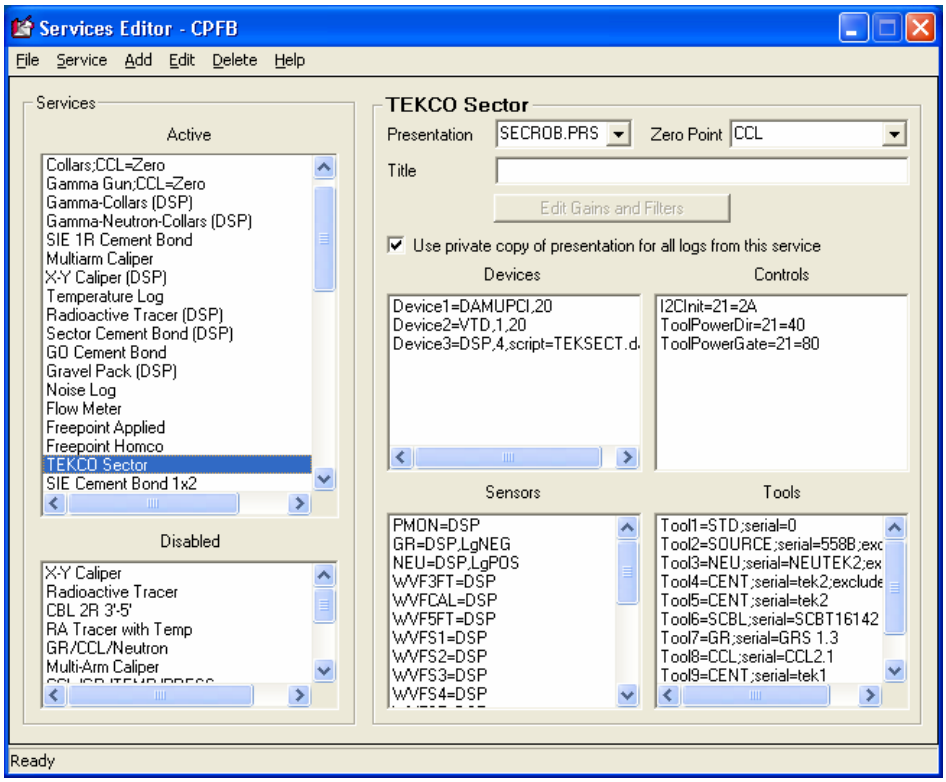


FIG: 22.39 Edit Logging details

Highlight the service to be renamed. In this example, TECKO Sector is highlighted.

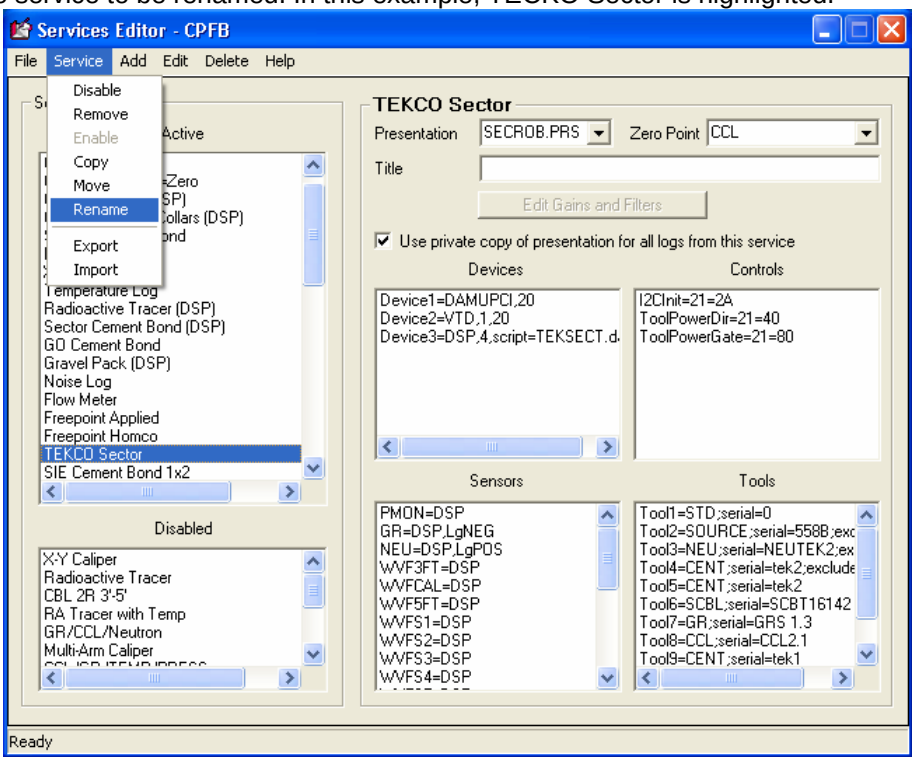


FIG: 22.40 Rename

From the drop down menu, select Service -> Rename.

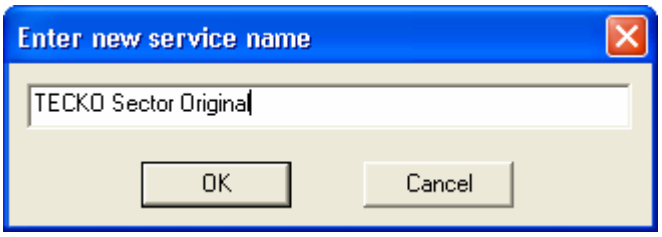


FIG: 22.41 New Service name

Type in the new name for the service and click on OK.

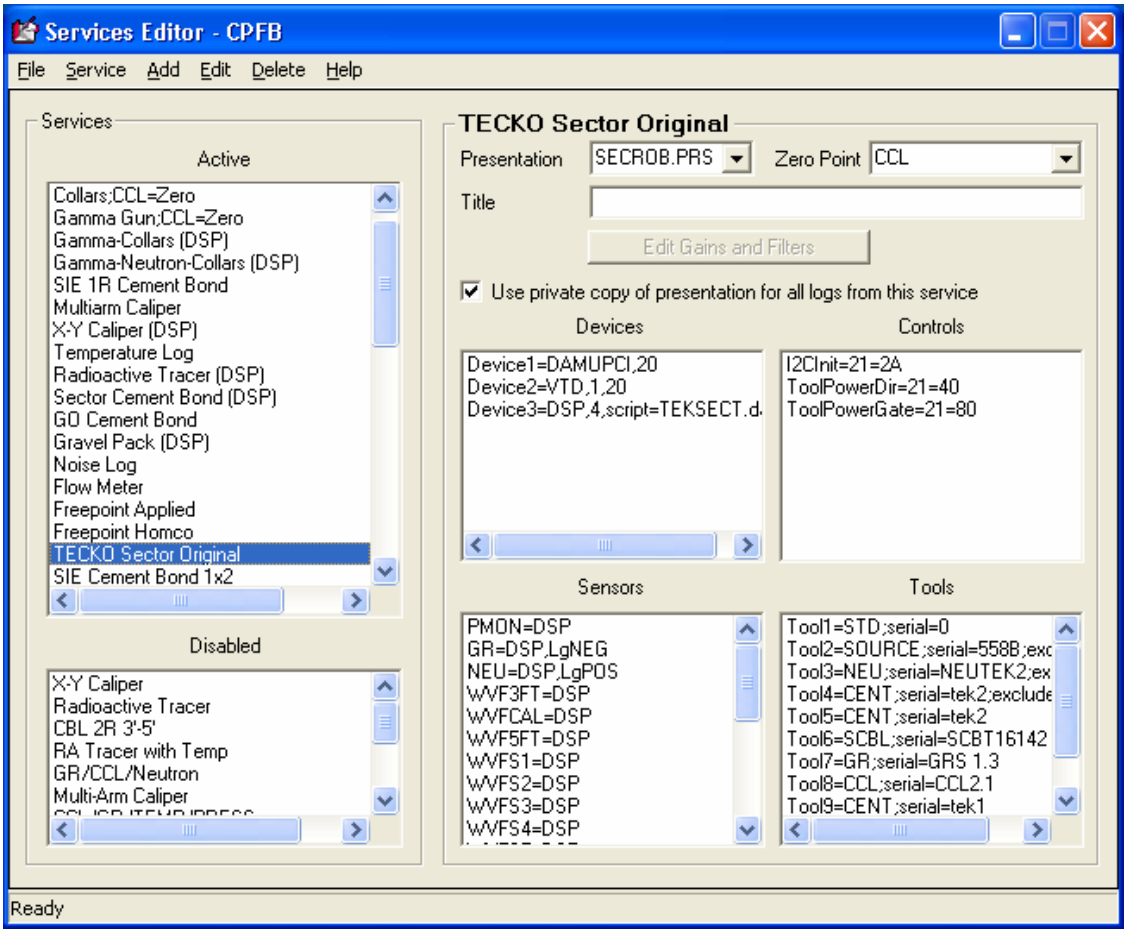


FIG: 22.42 Service Editor

The service now has new name.
This ends the renaming process.

Section

23

23 Spartek Tools

23.1 Tool Editor Setup

In the Warrior Utilities, Edit Logging Tool Details check to see if the default (sample) Spartek logging tools are present. SPTK-BULLPLUG, SPTK-CCL, SPTK-CENT, SPTK-FULLBORE, SPTK-GRCCL, SPTK-MAST, SPTK-PTC, SPTK-SPIN, SPTK-TEMPPRES, SPTK-TPCD.

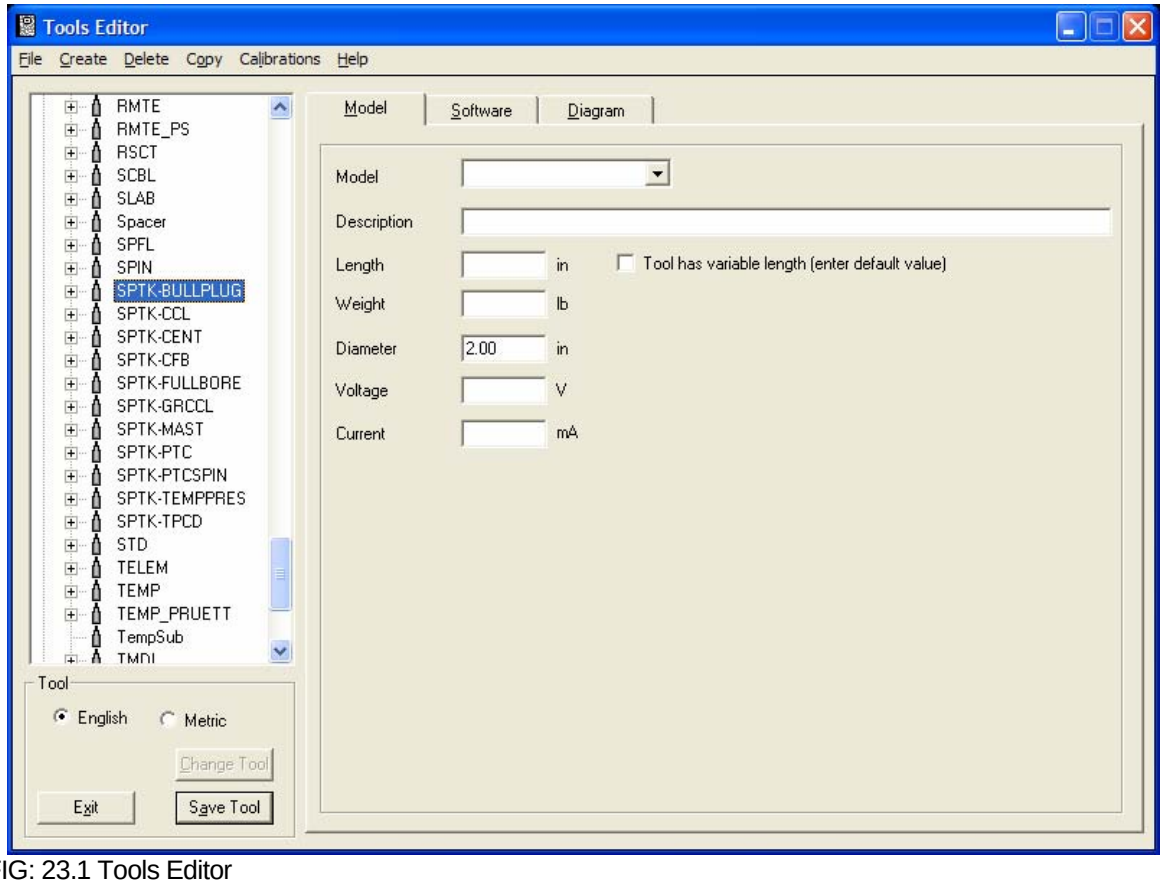


FIG: 23.1 Tools Editor

If these tools are not present use the Calibrations->Restore feature to either restore the sample tools from "**CH USB 70.wcf**" or "**SpartekPL.wcf**".
There are also some "external" calibration files needed to correctly configure some of the tools, these are the pressure and temperature quartzdine format .cff and .cft files. These will be provided by

Spartek but sample files are included in our release and also in the file "**SpartekCals.zip**". These files need to be in the "**Warrior\Config**" directory.
Special care needs to be taken when creating a new Spartek tool in the Warrior system when basing it on an existing example tool. The Spartek tools communicate their types and serial numbers via telemetry to the system, and likewise the tools are set up in Warrior to convey their types and serial numbers to the telemetry handling device (the DSP inside the panel). Each tool will be examined in turn to demonstrate where the type and serial information is stored to be passed on to the telemetry

23.1.1 SPTK-BULLPLUG
Well, the first one on the list is an exception to the rule, no ID or type; this tool can be copied again as necessary without any special steps.

23.1.2 SPTK-CCL
In the example screenshot the field in the Software, Serial section termed "**TelID**" needs to be filled correctly, this tool, serial number **L00121**, has the **TelID** field set to "**ccl@121**", this is type@serial and the format follows through the tool family. Note that the "L00" has been stripped off, this is because the tools identify themselves in telemetry in the same manner, only the numerical part of the serial number is used. This field will need to checked and filled when creating new tools.

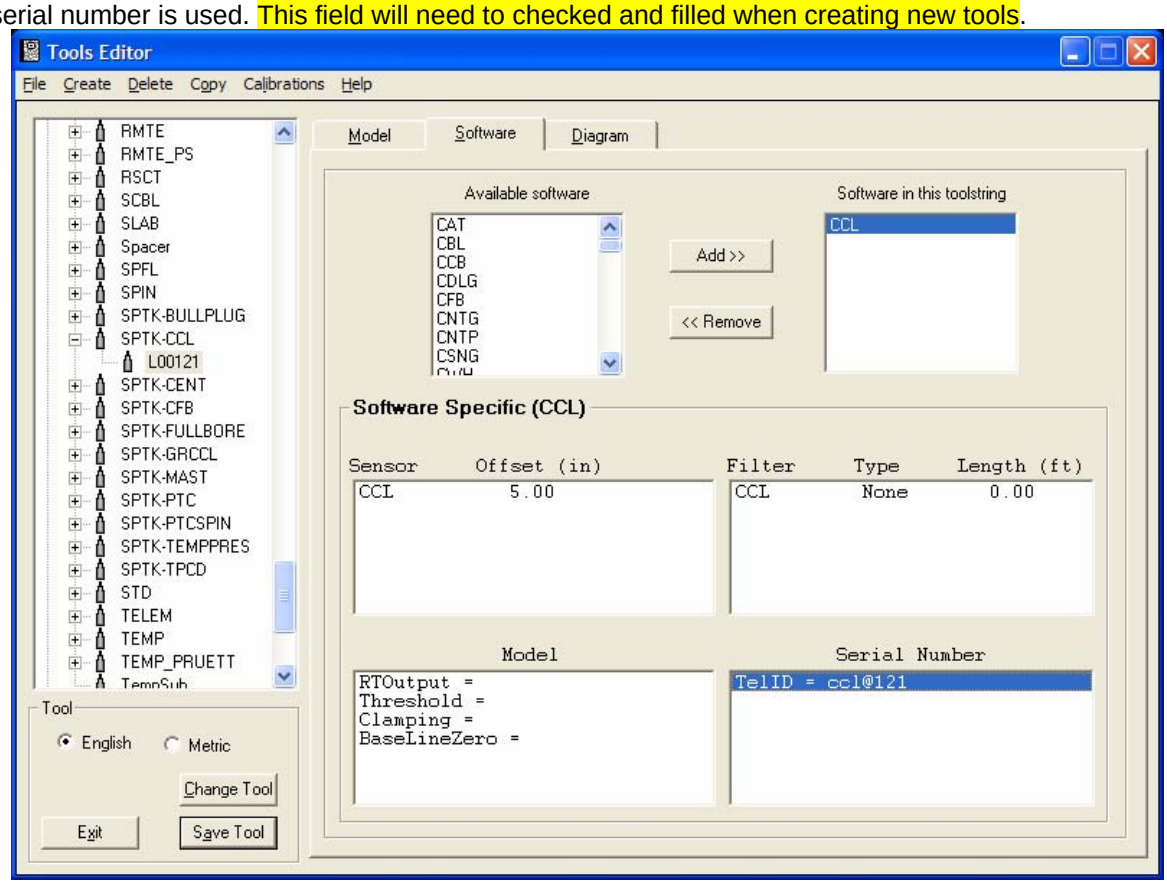


FIG: 23.1 CCL Tool

23.1.3 SPTK-CENT
The centralizer does identify itself in the toolstring so appropriately there is the need for it to have the correct **TelID** setup. In the first screen shot the software section of the tool serial **L00318** is shown having a Sensor called "**IDOnly**", double clicking on this brings up a second screen where the field "**Telemetry ID**" is filled in with "cent@318". This field will need to be checked and filled in correctly for new tools created in the system.

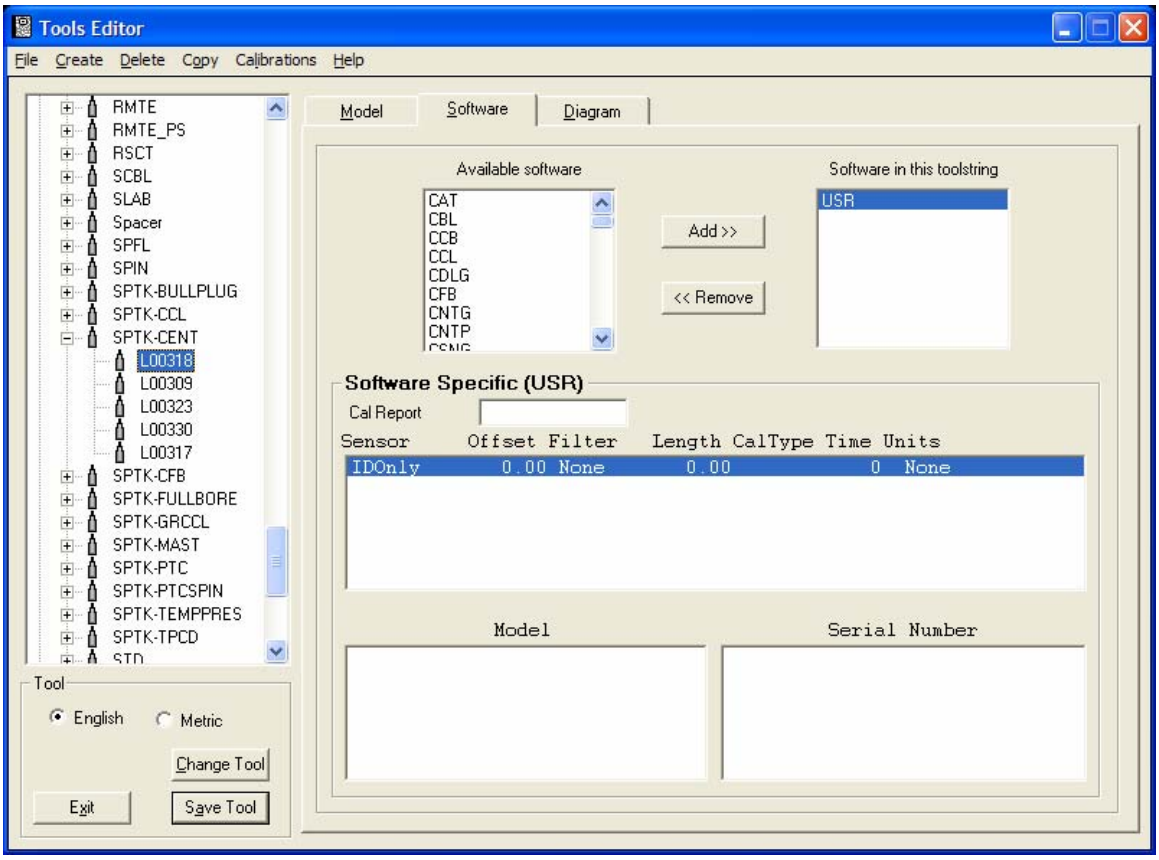


FIG: 23.2 CENT Tool

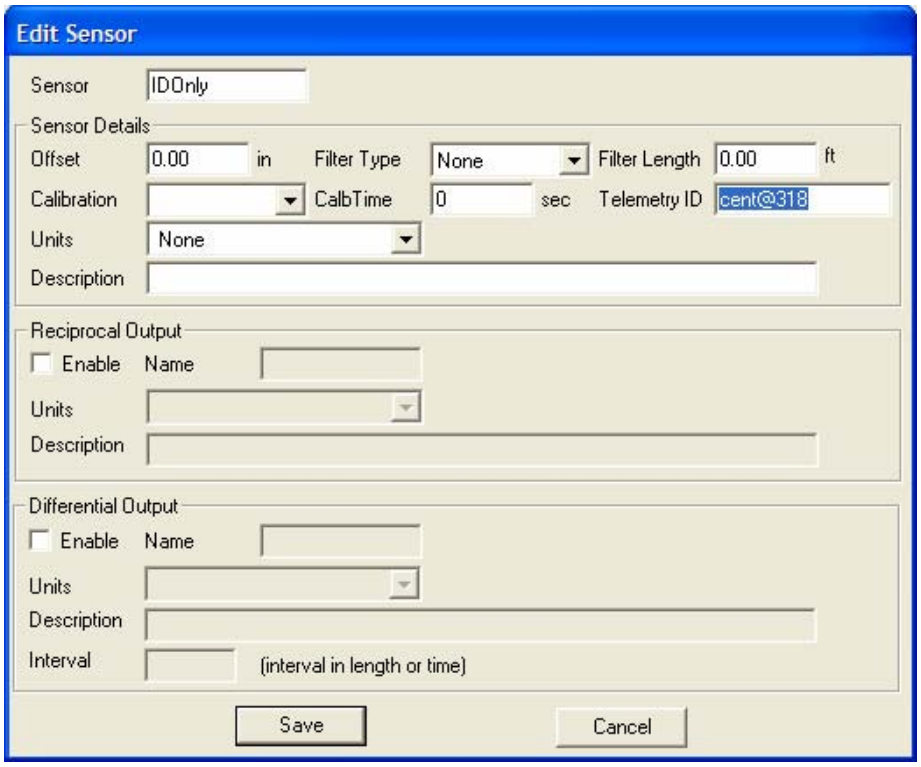


FIG: 23.3 CENT Sensor

23.1.4 SPTK-CFB

This tool type takes care of the 1-3/8" caged spinner tools. The example shown with tool serial "L00264" shows the TelID field in the Software screen, Serial Section, filled with "cfb@264" appropriately. This field will need to checked and filled when creating new tools.

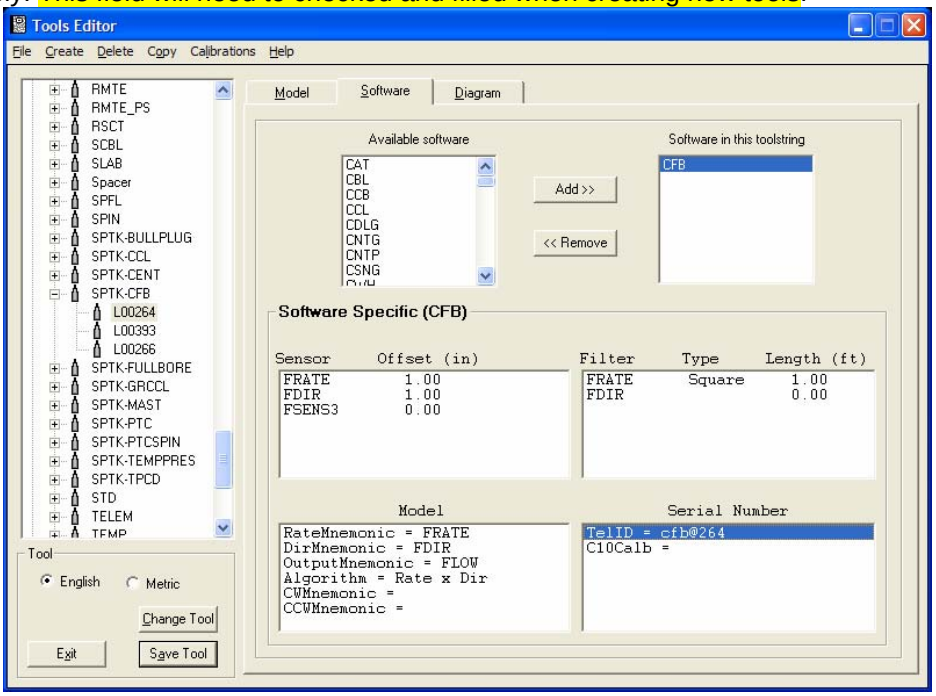


FIG: 23.4 CFB Tool

23.1.5 SPTK-FULLBORE

This tool takes care of the 1-3/8 folding flow meter. It is setup in the same manner as the **SPTK-CFB** as seen in the following screenshot, the "**TelID**" uses the same "**type**" being "**cfb**" as before. This field will need to checked and filled when creating new tools.

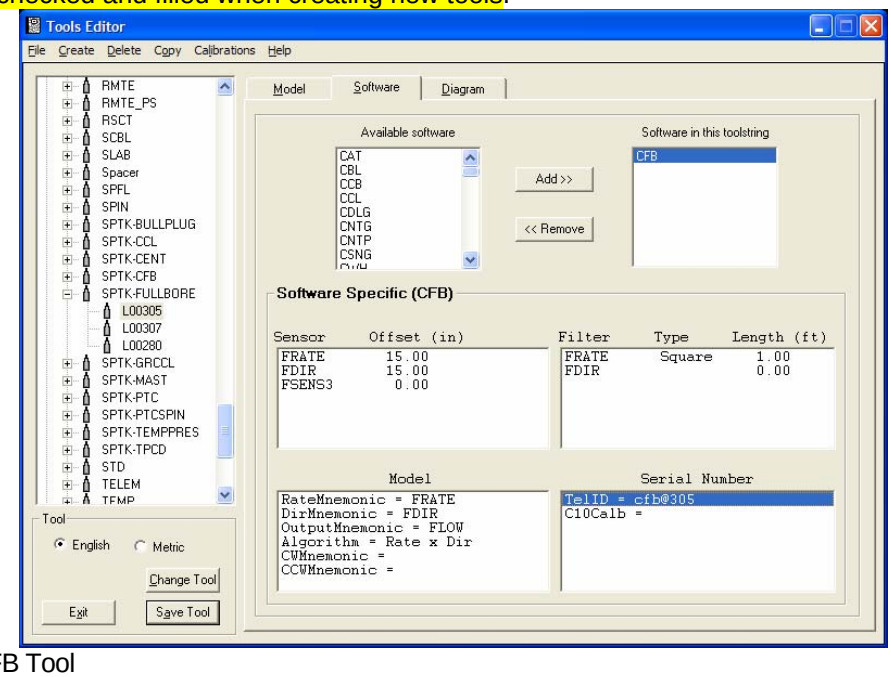


FIG: 23.5 CFB Tool

23.1.6 SPTK-GRCCL

The setup for this tool is slightly different as for the spinner tools as the tool incorporates two software modules combined to represent the tool in its single housing, being the CCL and GR. The "**TelID**" information only has to be present in one part of the tool information, we have chosen to use the CCL screen as this is the default when looking at the tool information and creating the new copies of the tool. In the screen shot below for example tool "**L00043**" the "**TelID**" is "**grccl@43**". This field will need to checked and filled when creating new tools. If you click on the "**GR**" in the "**Software in this toolstring**" box you will see the GR setup and also note that intentionally the "**TelID**" field is left blank, this does not have to be filled in as the CCL software is communicating to the telemetry that the tool is present.

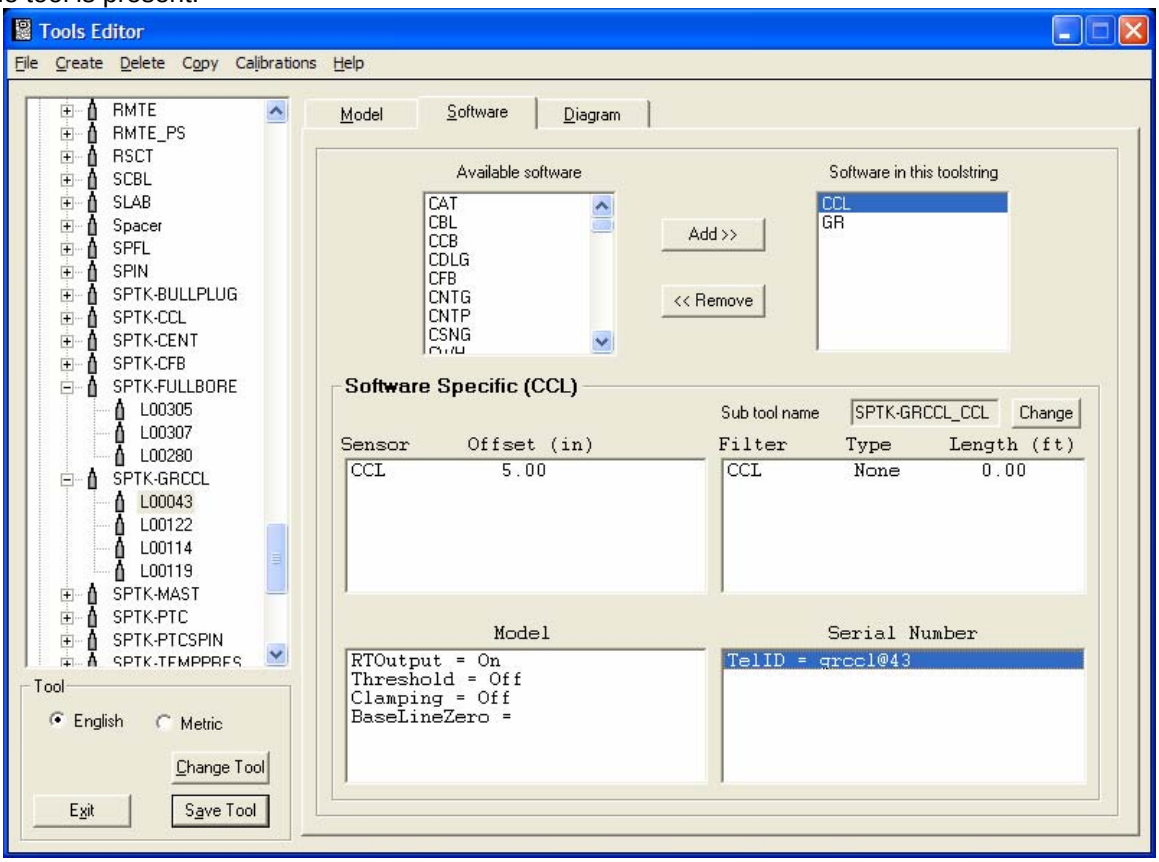


FIG: 23.5 GRCCL Tool

23.1.7 SPTK-MAST

This takes care of both the 1" and 1-3/8" telemetry master tools. There is one example of the 1" tool, serial "**L00020**" and several examples of the 1-3/8" tools, such as "**L00041**". Care must be taken when copying one of these tools to create a new one in the system that the correct model type is selected, this is in the "**Model**" tab-screen of the tool in the Tools Editor. The SPTK-MAST tools have three sensors, double clicking on any sensor will bring up its set-up screen. As each sensor can have a "**Telemetry ID**" but we only need one to convey the tool type and identity to the telemetry we have chosen to set this up with the "**CHV**" sensor. Care must be taken to check and fill in this field when copying these tools.

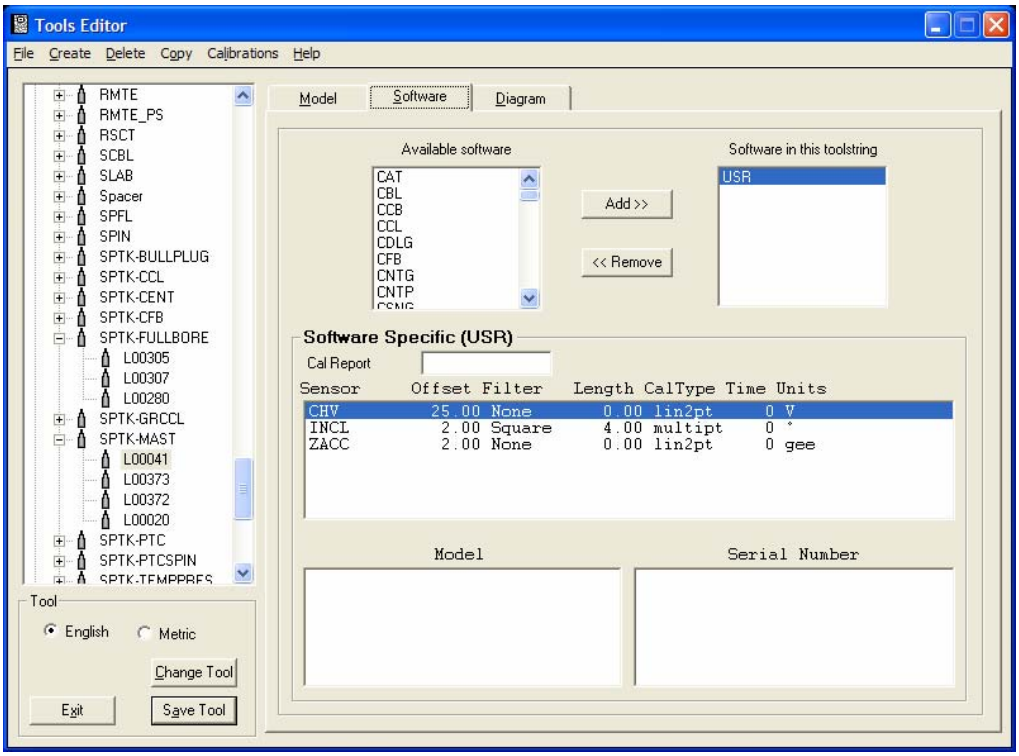


FIG: 23.6 MAST Tool

In this example the "**Telemetry ID**" is "**mast@41**", the same type "**mast**" is used for both 1" and 1-3/8" tools.

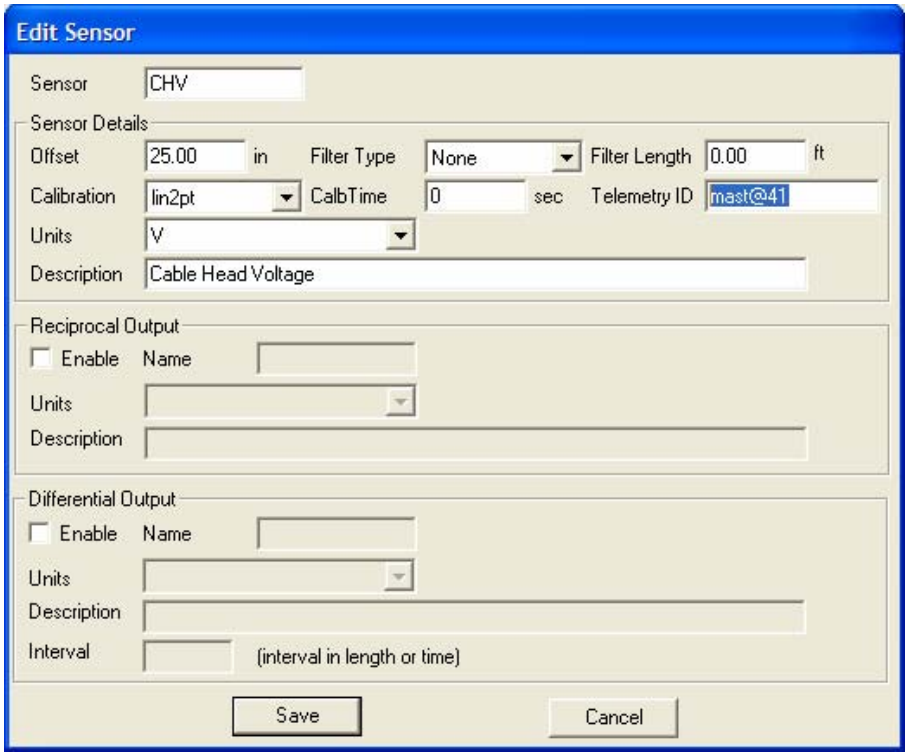


FIG: 23.7 Edit sensor

Calibration values for the INCL and ZACC have to be provided by Spartek and are hand-entered in the software using Acquisition->Edit->Calibrations and selecting the appropriate output. For example with the INCL (inclinometer):

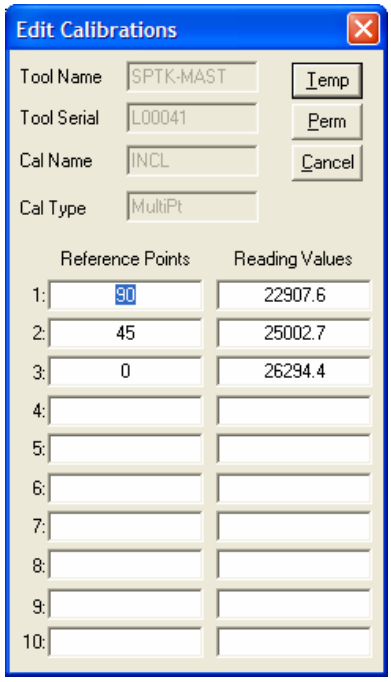


FIG: 23.8 Edit Calibration

23.1.8 SPTK-PTC

This tool is another composite of several tool software modules using **CWH** (Capacitance) and **PRESTEMP** (Pressure/temperature) software. The example tool "**L00026**" sets up the "**TelID**" in the **CWH** page as seen in the screen shot, "**ptc@26**". Care must be taken to check and fill in this field when copying these tools. The CWH calibration is hand entered similarly to the INCL mentioned above, via Acquisition->Edit->Calibrations and selecting the "**CWH**" from the list. Currently Warrior software is supporting this with 10 calibration multi-points (provided by Spartek), this may change in the future converting to a curve-fit type calibration that can handle more points. Clicking on the "**PRESTEMP**" line on the "**Software in toolstring**" box will bring us to the pressure/temperature setup. There are three sensors here, **PTCP**, **PTCT** and **PTCTEMP**. All of them need correct configuration when setting up a new tool. Double clicking on a sensor will take you to the sensor setup screen and importantly the "**Gauge Serial No.**" of each sensor needs to be filled correctly. These fields relate directly to the external calibration files (provided by Spartek) for the tool. Each prestemp sensor has a calibration file. The file name is the composite of the serial number and the sensor channel, for example for tool "**L00026**" the pressure calibration name is "**L00026-01303**", software automatically assigns the file extension (**.cff** or **.cft**) by gauge type (pressure or temperature). These fields have to be correctly configured for each sensor and each tool.

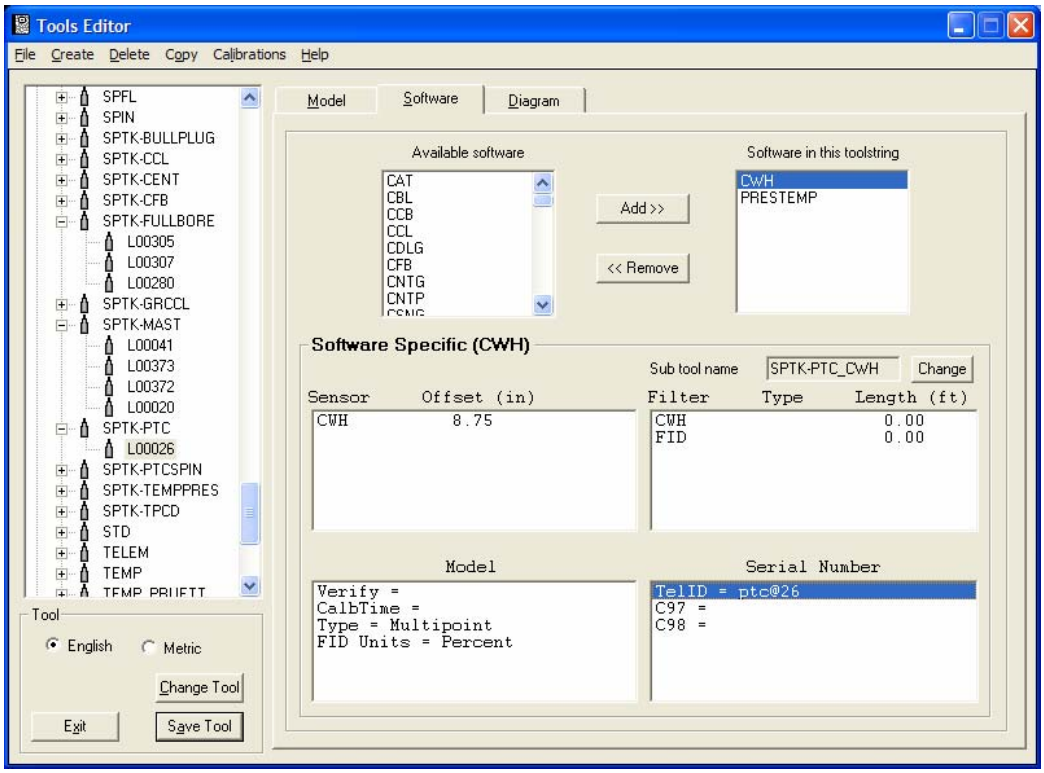


FIG: 23.9 Tools Editor

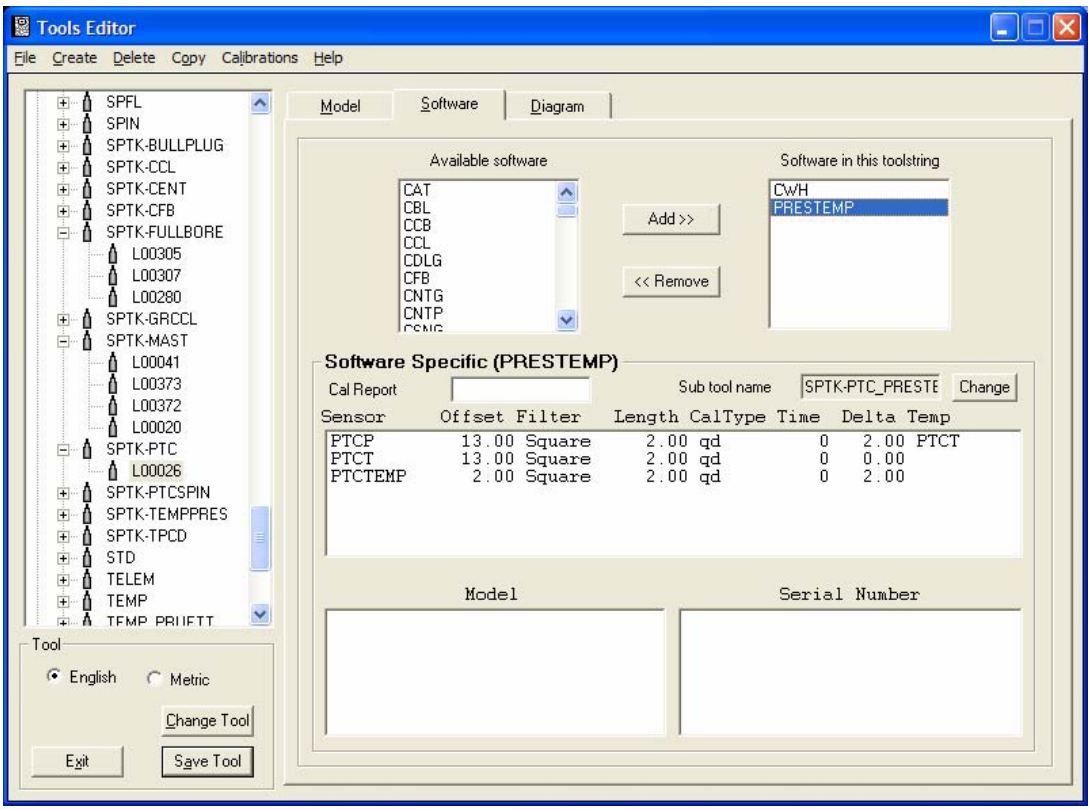


FIG: 23.10 Tools Editor

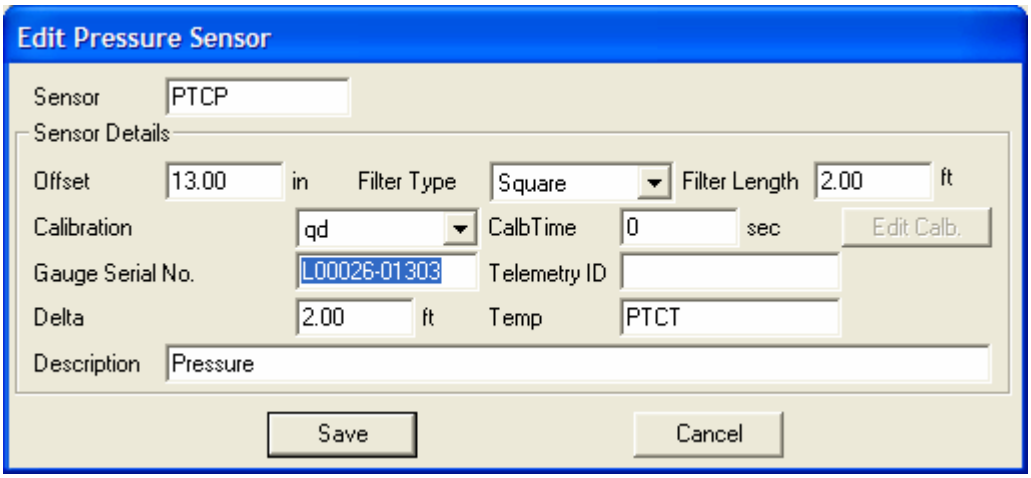


FIG: 23.11 Edit Pressure sensor

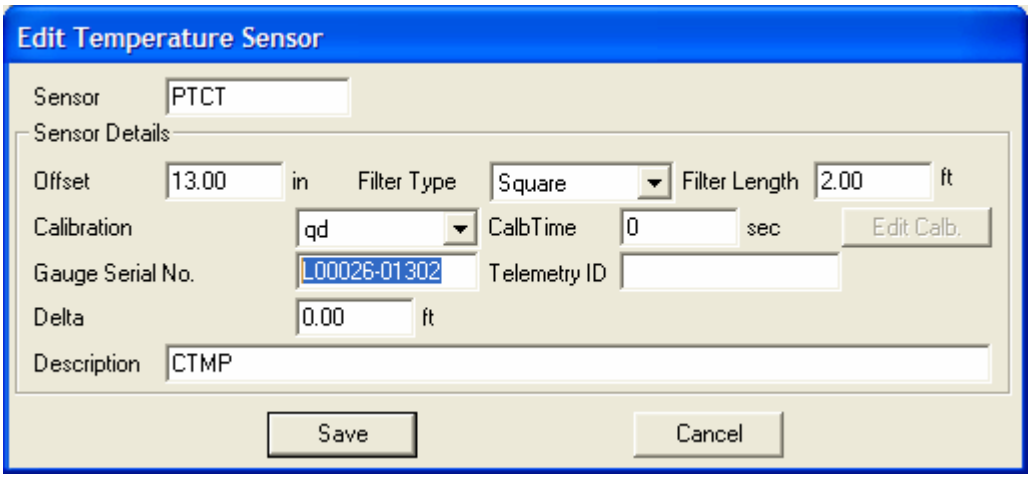


FIG: 23.11 Edit Temperature sensor

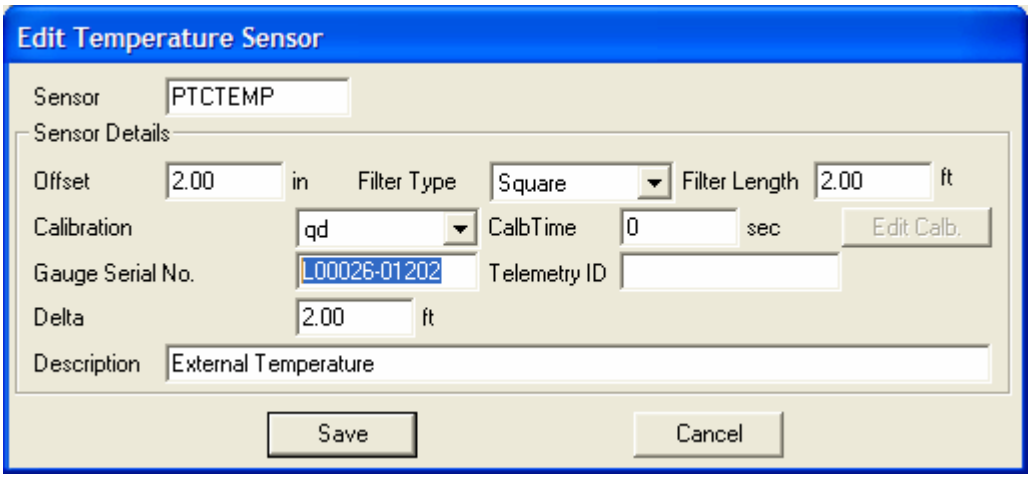


FIG: 23.12 Edit External Temperature Sensor

23.1.9 SPTK-SPIN

This is for the 1” spinner that is optionally run on the **PTC**. Setup is very similar to the **SPTK-CFB** except that the “**TelID**” has a different identifier, for the example tool “**L00026**” the “**TelID**” is “**spin@26**”.

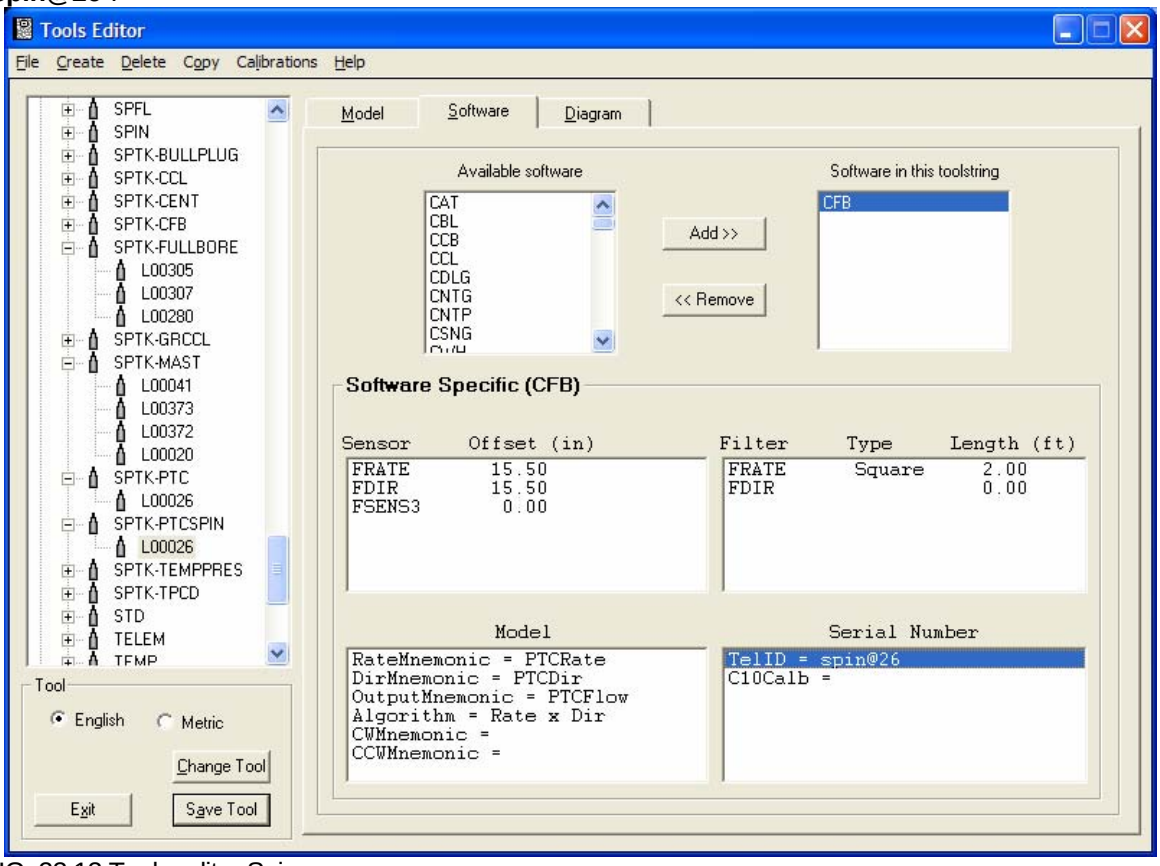


FIG: 23.13 Tools editor Spin

23.1.10 SPTK-TEMPPRES

This tool is the combined 1-3/8” Temperature/Pressure. Setup is similar to the **PTC** Prestemp software section. Each sensor must have the correct “**Gauge Serial No.**” entry to identify the calibration file. The “**Telemetry ID**” is entered only in the “**TPP**” sensor setup as shown in the screen shots below. The example tool is serial “**L00022**” and the “**Telemetry ID**” is “**tp@22**”. Each sensor must have the calibration file info entered as before in the **PTC** example and as demonstrated below. These fields have to be correctly configured for each sensor and each tool. The external calibration files will be provided by Spartek and copied to the Warrior\Config directory as before.

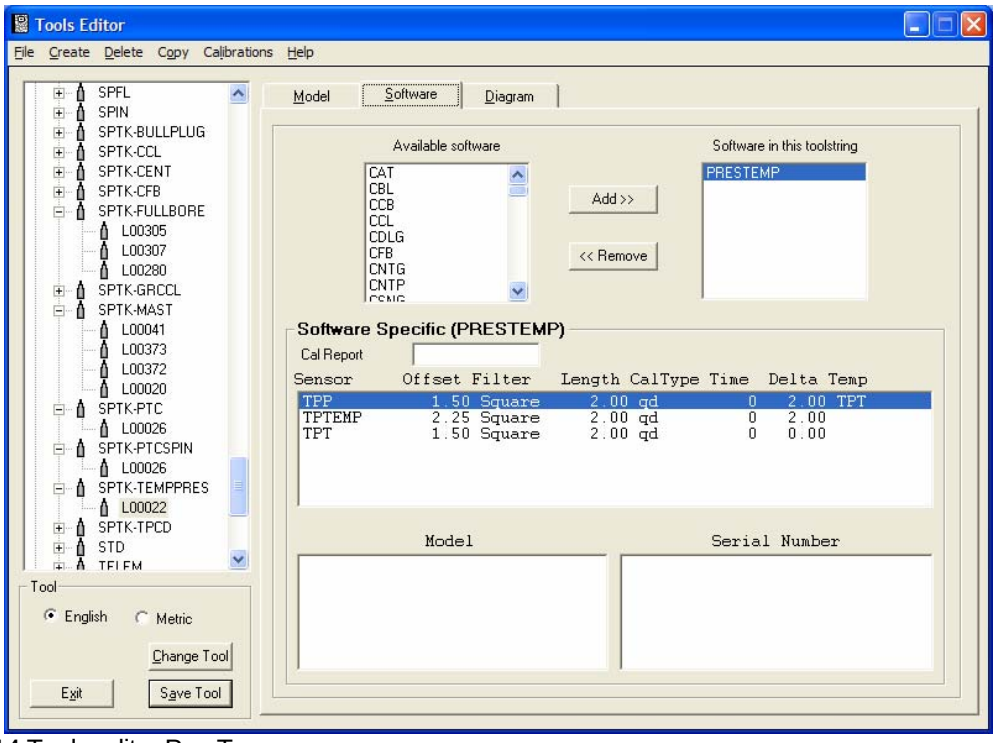


FIG: 23.14 Tools editor PresTemp

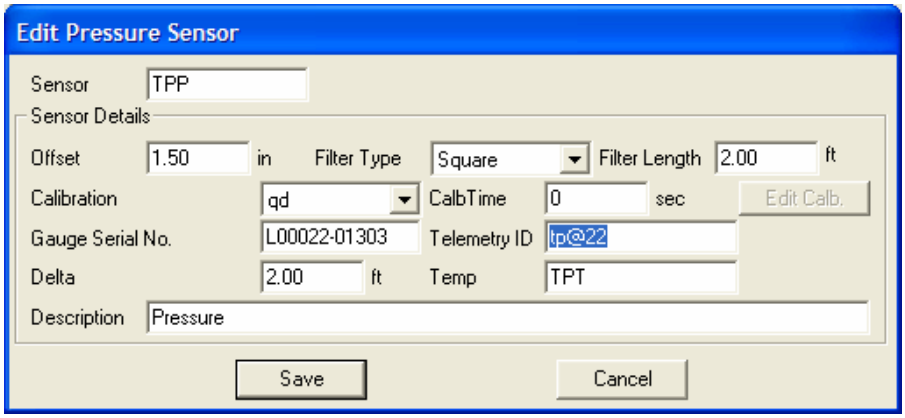


FIG: 23.15 Edit Pressure sensor

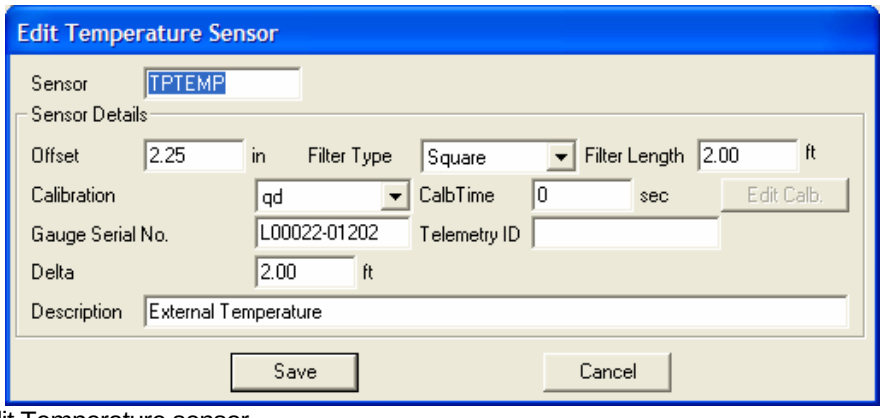


FIG: 23.16 Edit Temperature sensor

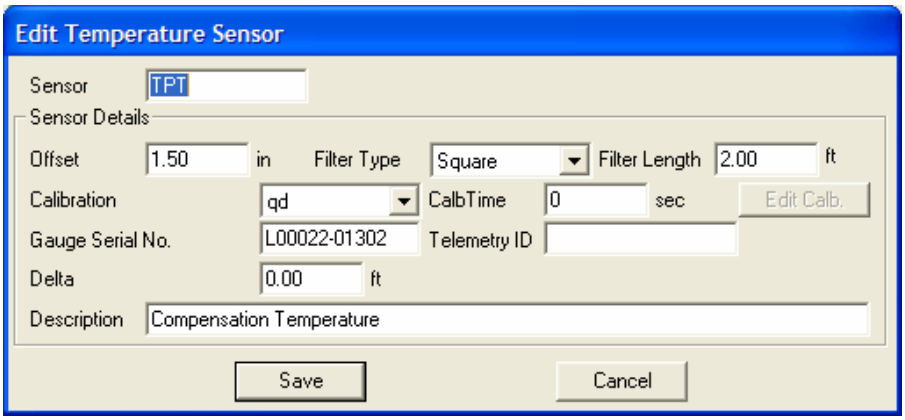


FIG: 23.17 Edit Compensation Temperature sensor

23.1.11 SPTK-TPCD

This is set up for the 1-3/8" TPCD tool with dual pressure, external temperature and capacitance. It comprises three software modules, CWH, PRESTEMP and GRADIO. GRADIO is purely a calculation module that uses pressure or delta pressure outputs together with the INCL output of the **SPTK-MAST** to calculate fluid density. Setup is the same as for the **SPTK-PTC** and this can be used as a reference with the exception shown in the "**TelID**" type being "**tpcd**", so for example tool "**L00051**" the "**TelID**" is set up as "**tpcd@51**" as seen in the CWH screen shot below. There are 5 Prestemp sensors to be configured correctly as seen in the example and this will need 5 corresponding external calibration files from Spartek copied to the \Warrior\Config directory. The sensors are **PRESU**, **PRESL**, **TEMP**, **TEMPU** and **TEMPL**.

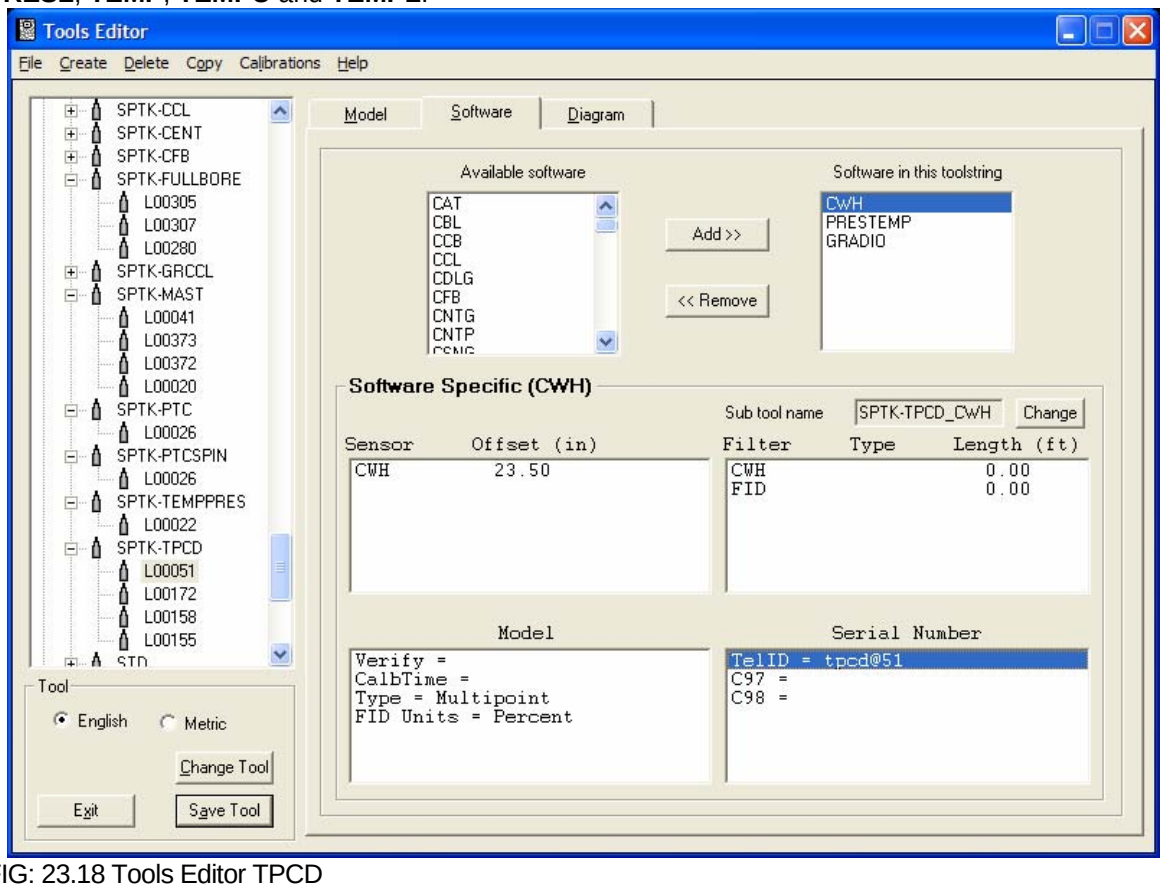


FIG: 23.18 Tools Editor TPCD

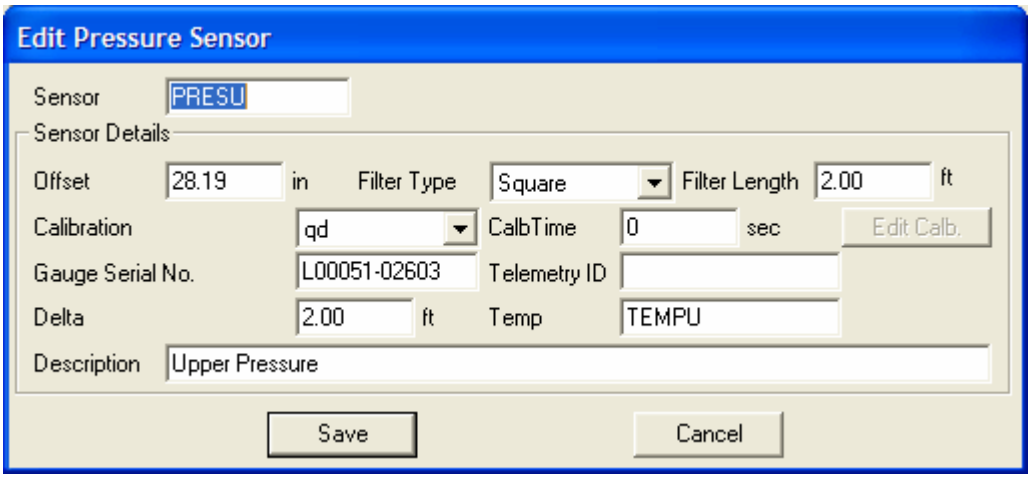


FIG: 23.19 Edit Pressure sensor

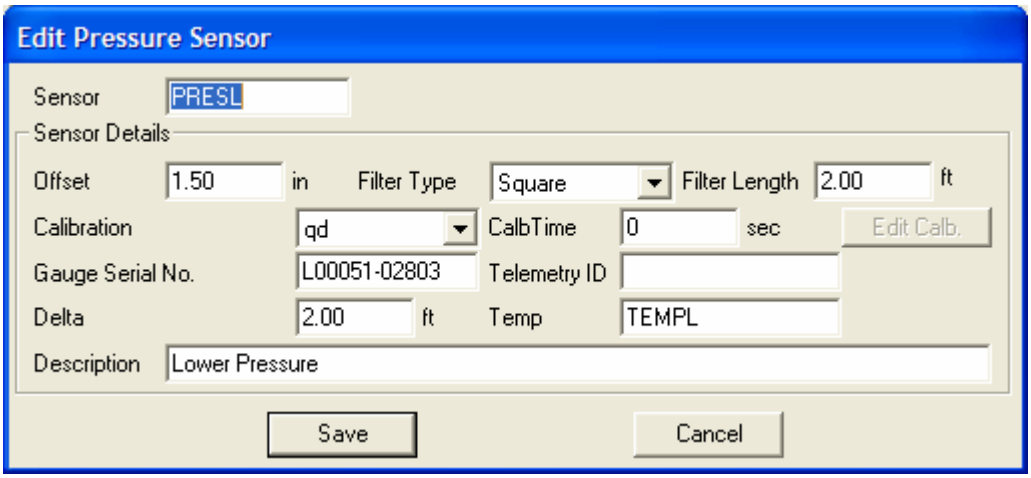


FIG: 23.20 Edit Pressure sensor

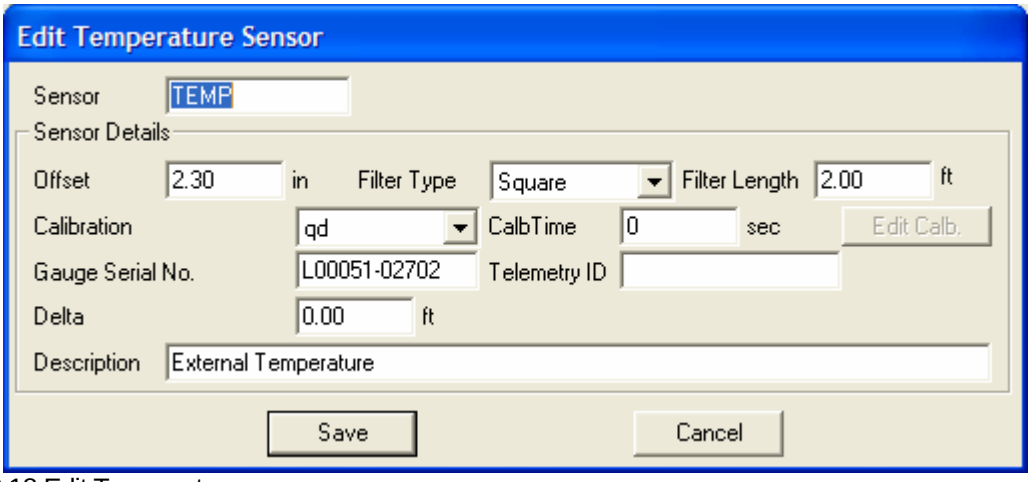


FIG: 23.18 Edit Temperature sensor

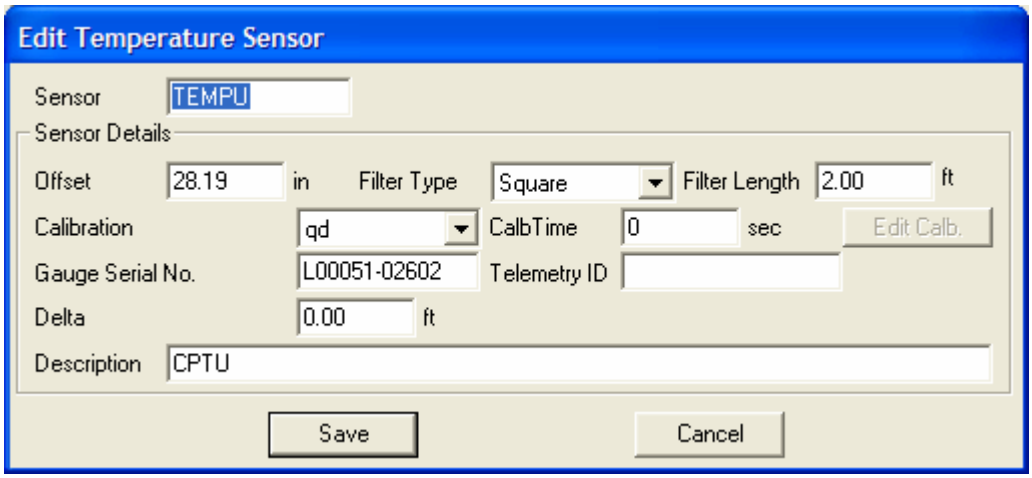


FIG: 23.19 Edit Temperature sensor

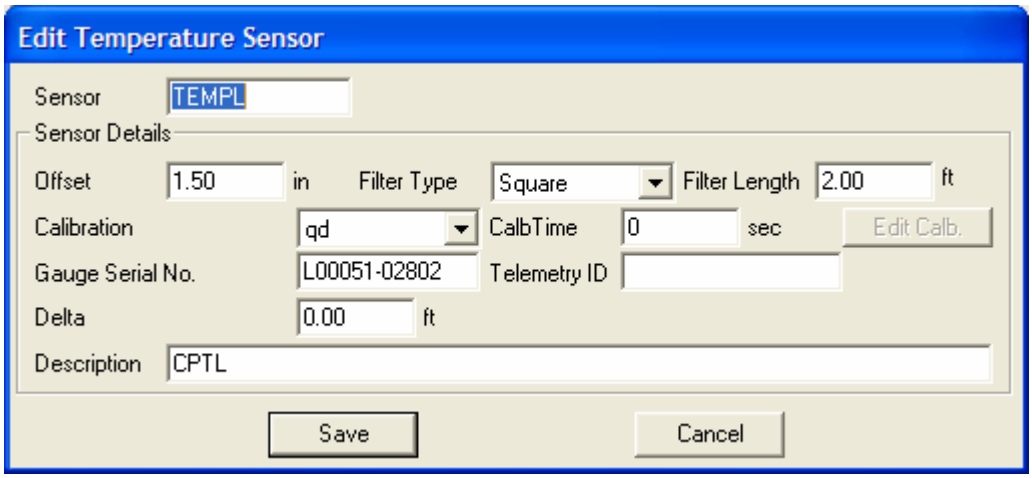


FIG: 23.20 Edit Temperature sensor

23.2 Acquisition

When selecting the Spartek service you will first need to configure the Tool String in the Tool String Editor:

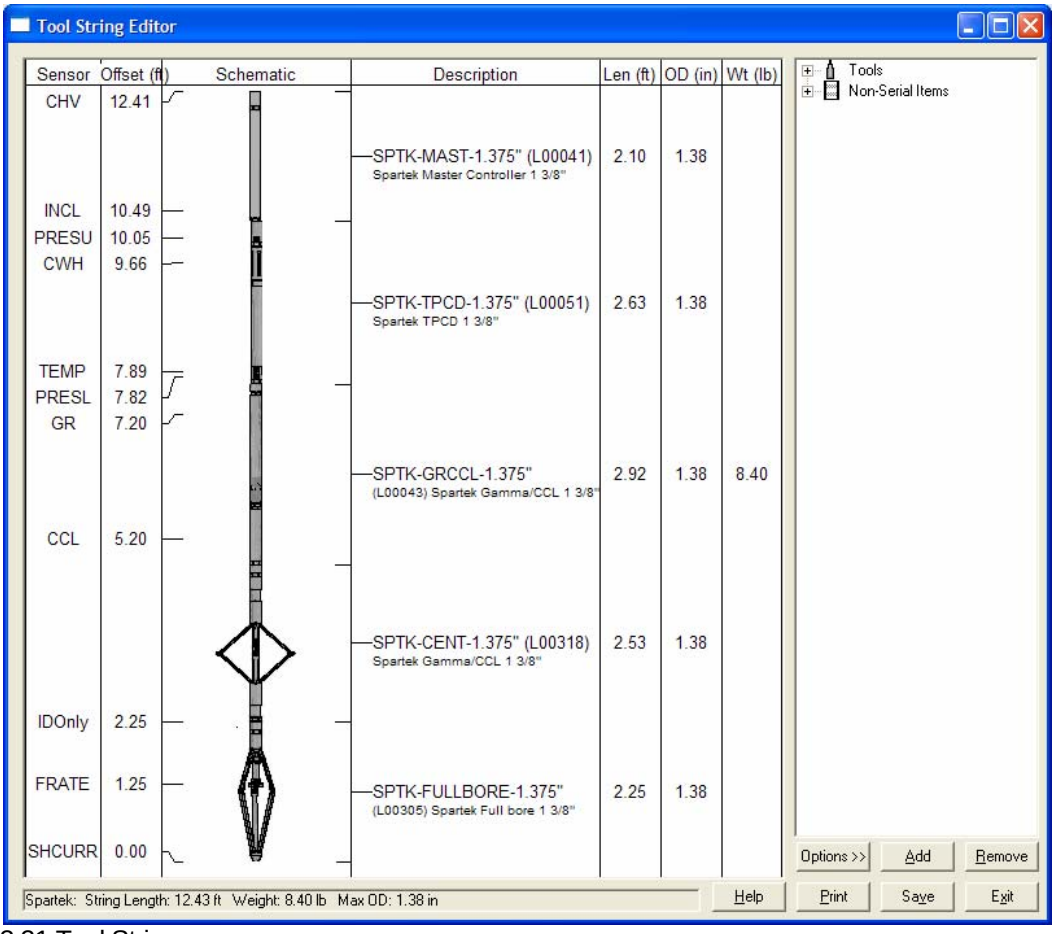


FIG: 23.21 Tool String

Once this is set up how you want to run the tools pres Save.
The normal acquisition windows will now appear and will include the Spartek Telemetry monitor, and the TEL Threshold screen. This is how they will appear before tool power is applied:

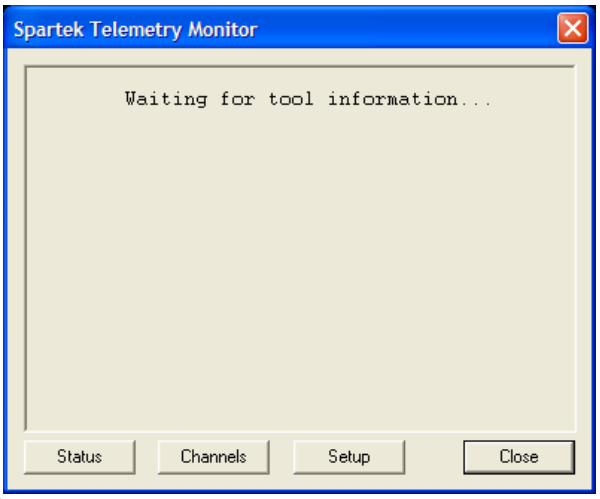


FIG: 23.22 Telemetry Monitor

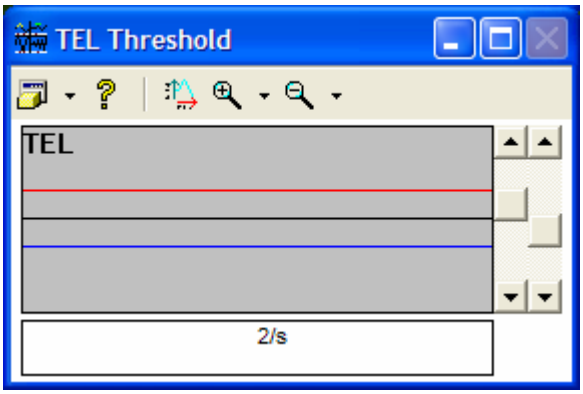


FIG: 23.23 Telemetry

Currently the system is set up to work with manual thresholds but possibly future automatic thresholds will be made available. Initial threshold settings (that can be saved so as not to set them every time the service is loaded) as above work fine.
Other settings that influence the telemetry detection are the line conditioning and gain settings. In Edit->Devices->SDSTIP the following general settings work well where only changes in the gain using the AUX slider will be needed to “sync” the tool.

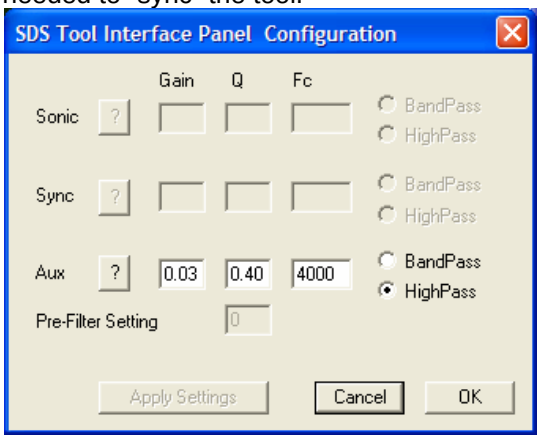


FIG: 23.24 SDSTIP

On powering the tool, if an uplink is detected the system goes through a sequence of enquiring the tools themselves as to what type and serial numbers they are and also configuring the telemetry to be setup in the specified configuration that the user selected.
Any differences between the user set up and the tool responses to the enquiries will be shown in the monitor. One other possibility is that the tools are unable to respond to the system downlink (on extremely long cables), in this case the system makes no attempt to downlink a new configuration and will simply try to acquire data from the tools in the manner they are sending it. Since these tools memorize their prior configuration it is possible to use the system to configure the tools while on surface using a dummy-load cable and then running them in the whole where they will work without being configured again on power-up.
The following screen shots indicate a normal start up and also ones with non-matching user selection and actual tools and a shot of the TEL Threshold monitor:

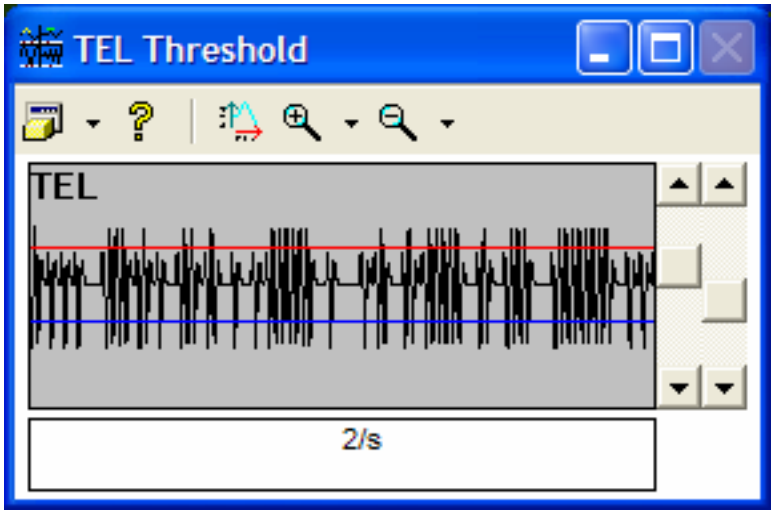


FIG: 23.25 Tel Threshold

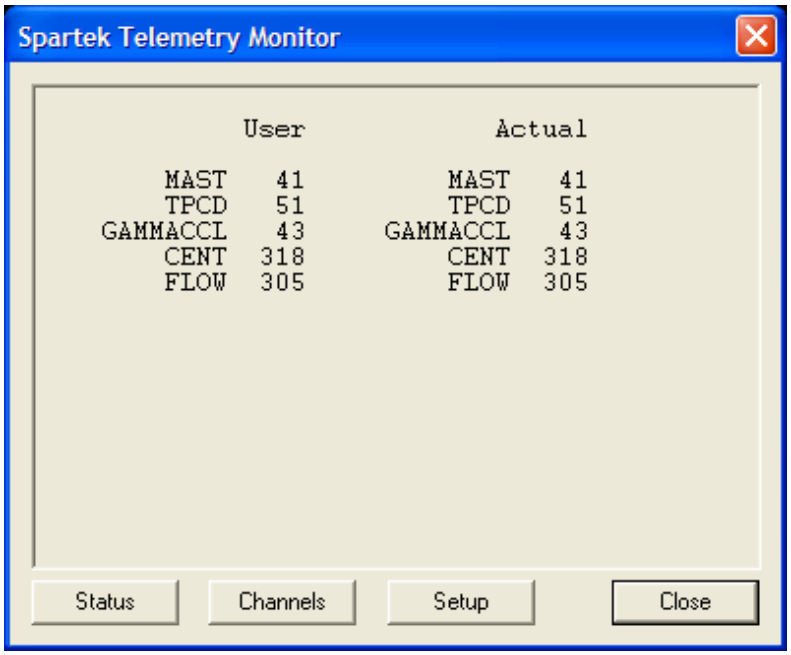


FIG: 23.26 Telemetry Monitor

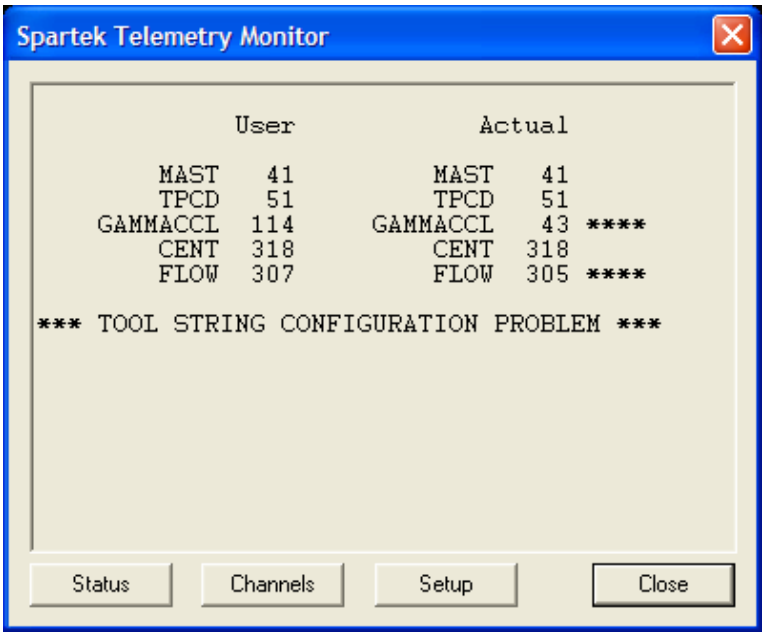


FIG: 23.27 Telemetry Monitor

It is advisable that once the status screen has been updated with the tool information that the user switch to the Channels display. This will show the Frame Count and as importantly the Errors. Normal operation will show an update of 10 frames per second, some initial errors are normal while the configuration is taking place but this should not update once the tools are running. The sensor channels are unprocessed raw counts.

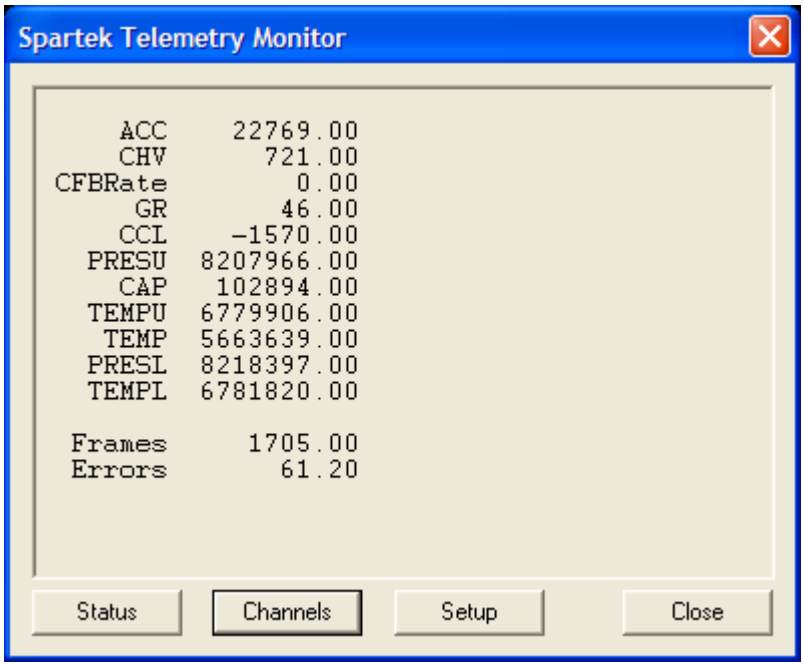


FIG: 23.28 Telemetry Monitor

The final view option is Setup. This tells us exactly what the downhole EEPROM was programmed with to configure the master controller. Each press of Setup will take us on to a new setup screen.

Section

24

24 Radioactive Tracer Survey

24.1 Setup Procedure

Bring up Radioactive Tracer service.
Click **Acquisition Box - Edit - Tool String**
Edit the tool string as necessary to reflect the tool string being run. This is important to insure proper offsets, filters, and tool diameters.
Click **Acquisition Box - Edit - Variables**

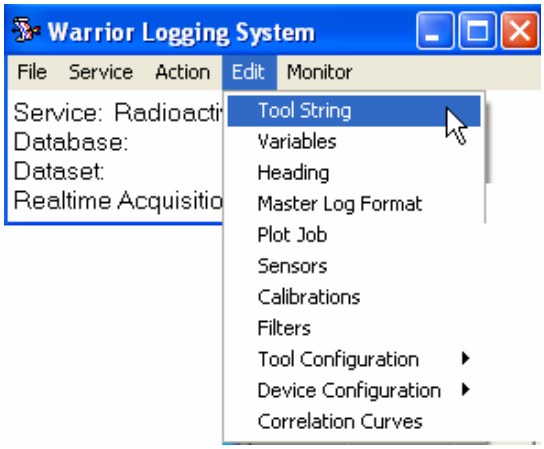


FIG: 24.1 Tool String

Edit the variables to reflect the correct casing ID and tubing ID sizes for proper flow rate calculation (Tubing OD is also important if running in annulus). Add multiple zones if needed. (Note: a size of 0 indicates no casing, tubing, etc).

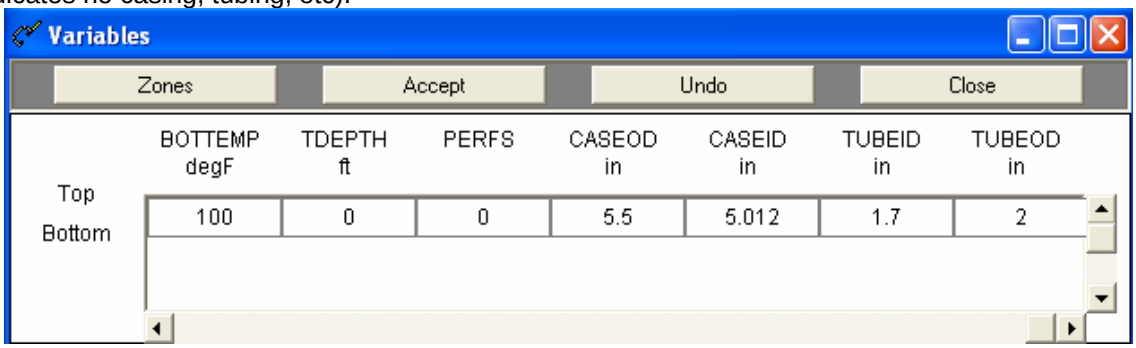


FIG: 24.2 Edit Variables

Click **Acquisition Edit Tool Configuration TREJCT** to bring up tracer configuration dialog box.

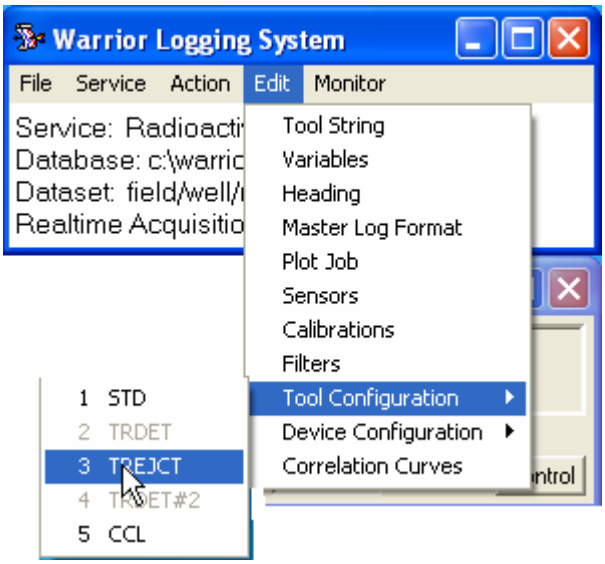


FIG: 24.3 Tool Configuration

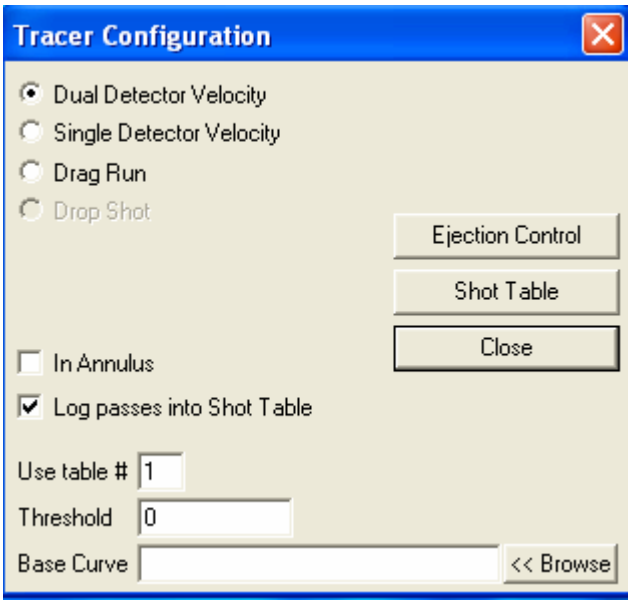


FIG: 24.4 Tracer Configuration

Pick the method of tracer log you wish to run Dual Detector, Single Detector, or Drop Run.
For Single Detector Velocity logs, the detection level can be determined from a base log pass if one has been run, (use browse to select it, it must be in your current database). Or enter a threshold value for the level of when a shot should be detected. More on this later.
If the log is being run in the annulus between the tubing and casing, check this box for proper flow rate determinations.
Other than base runs, make sure the Log Passes into Shot Table Box is checked.
While normally all shot passes are logged into a single table, more than one table can be used and would need to be selected.

24.1.1 Tracer Ejection Control

Click **Ejection Control** box to set up ejector control. The ejection duration that you choose is dependent upon your tool type and strength of the tracer material being used. (This should be tested with water prior to the job to determine the approximate number of shots that will be available during the job.)

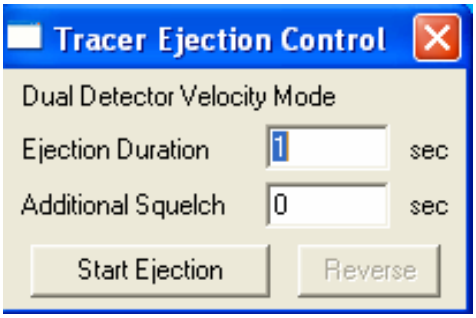


FIG: 24.5 Tracer Ejection Control

The Additional Squelch time is set to allow settling of the gamma detectors after the ejection to avoid noise being detected on the log.

24.2 Logging Procedures

The depths where a tool is positioned in the well can be critical to the final log interpretation. Normally the Warrior system uses the bottom of the tool string as its zero point; this may put the detectors several feet above the depth shown. (It is possible to change the zero point to a sensor if desired.)
If drag runs or velocity shots with a single detector are going to be done, it is recommended that a base run be logged first to record a background gamma. Use this to determine the threshold detection level or as a base curve that the threshold level is added to before detection occurs. Be aware detection occurs when the detector value crosses this threshold or base curve value plus threshold level, statistical deviations may cause premature detection. (Pick a high threshold level high enough to not cause premature detection.)

24.2.1 Velocity Shots

Position the tool in the well at the depth that you wish to make a shot. Shot passes can be Recorded on Time or by using the encoder simulator. The true depth of the encoder is used as the shot depth.
Start a log pass. Allow sufficient time for the detectors to obtain a “background reading”. Then click the **Start Ejection** control. Continue recording until the detectors have drop back to the previous background reading. Stop the log pass.
Log as many passes in this manner as desired.
The Shot Table will now reflect the information just recorded. If a single detector method was used, the times and the flow rates will be complete. If a dual detector method was used the pass will have to be correlated to calculate the proper time, and thus the flow rates, as described below.

24.2.2 Drag Runs

Normal procedure is to eject a tracer slug, then to drop down and Record Up until the slug passes, then stop the pass. Then drop back down and start another pass. Each pass is recorded as a separate entry into the shot table.
The normal calculations integrate the area between the detection level and the curve, so it is important to record the complete passing of the tracer material.

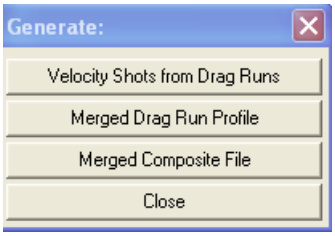


FIG: 24.6 Generate

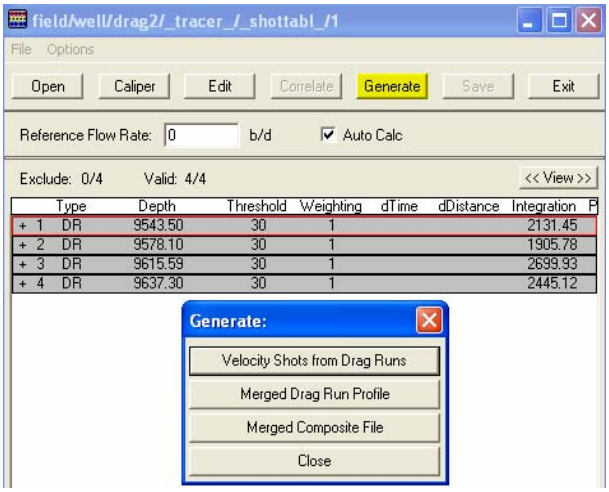


FIG: 24.7 Generate Drag Run Profile

By clicking on the Generate button of the Shot table, all drag runs with a plus sign will automatically be merged into a single presentation. Selected annotations can be added for each pass. By using auto merge, curves from other passes, such as collars, temperature, or gamma, can automatically be added to the presentation.
By clicking on Velocity Shots from Drag Runs, records in the shot table will be generated with distances between runs. To get the times, each record will then have to be correlated.

24.2.3 Shot Table Editing, Correlation, and Flow Rate Log Generation

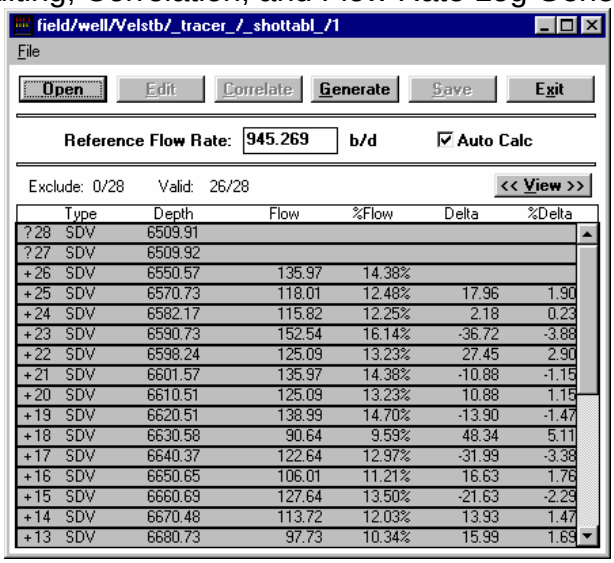


FIG: 24.8 Table flow rate

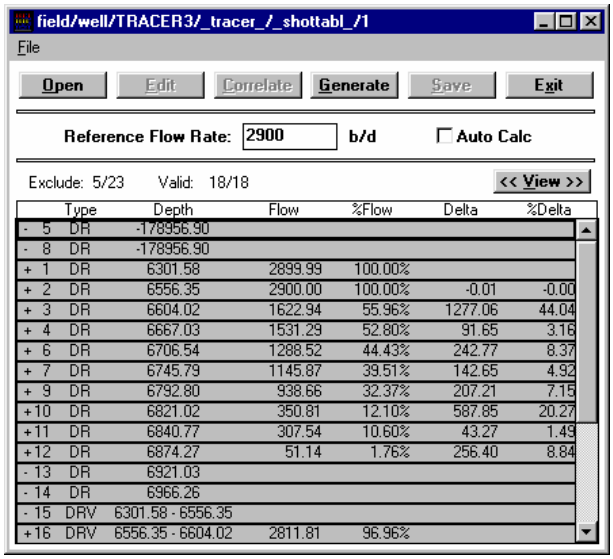


FIG: 24.9 Table Flow rate

Access to the shot table can be obtained through the Acquisition box and Editing Tool Configuration and choosing TREJCT and then clicking the Shot Table Button. It can also be accessed from the Utilities menu through the Tracer Interpretation selection.
The Shot Table shows the information taken each time a log pass was started. The first column contains a +, -, or ?. A + indicates a valid calculation. A – indicates that the record has been excluded from calculations. A ? indicates that correlation has not been done to determine time.The second column indicates the type of record. DR is drag run. DRV is velocity determined from drag runs. SDV is single detector velocity. DDV is dual detector velocity.
Other columns indicate depth of pass, flow rate, percentage of flow rate, change of flow rate, percent change of flow rate. By clicking on the view button, casing and tool dimensions can be viewed. Also available are detection times, integration, and dataset information.
Certain information for a given record can be edited by selecting the record and clicking the edit button or by double clicking on a record. Casing and tool dimensions can be changed. Weighting other than 1.0, adjusts the calculated output. . An unsatisfactory station can be removed from the flow rate calculations by removing the check mark beside **Include in calcs.** A record marked as reference will be considered to be maximum or 100% flow rate.

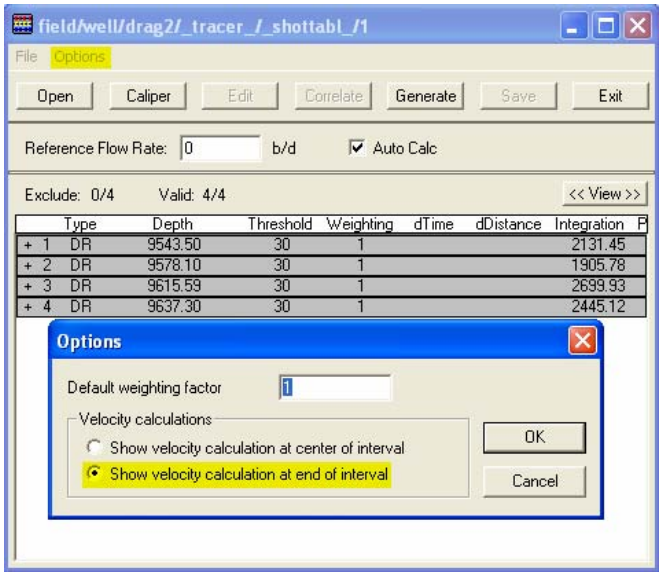


FIG: 24.10 Options

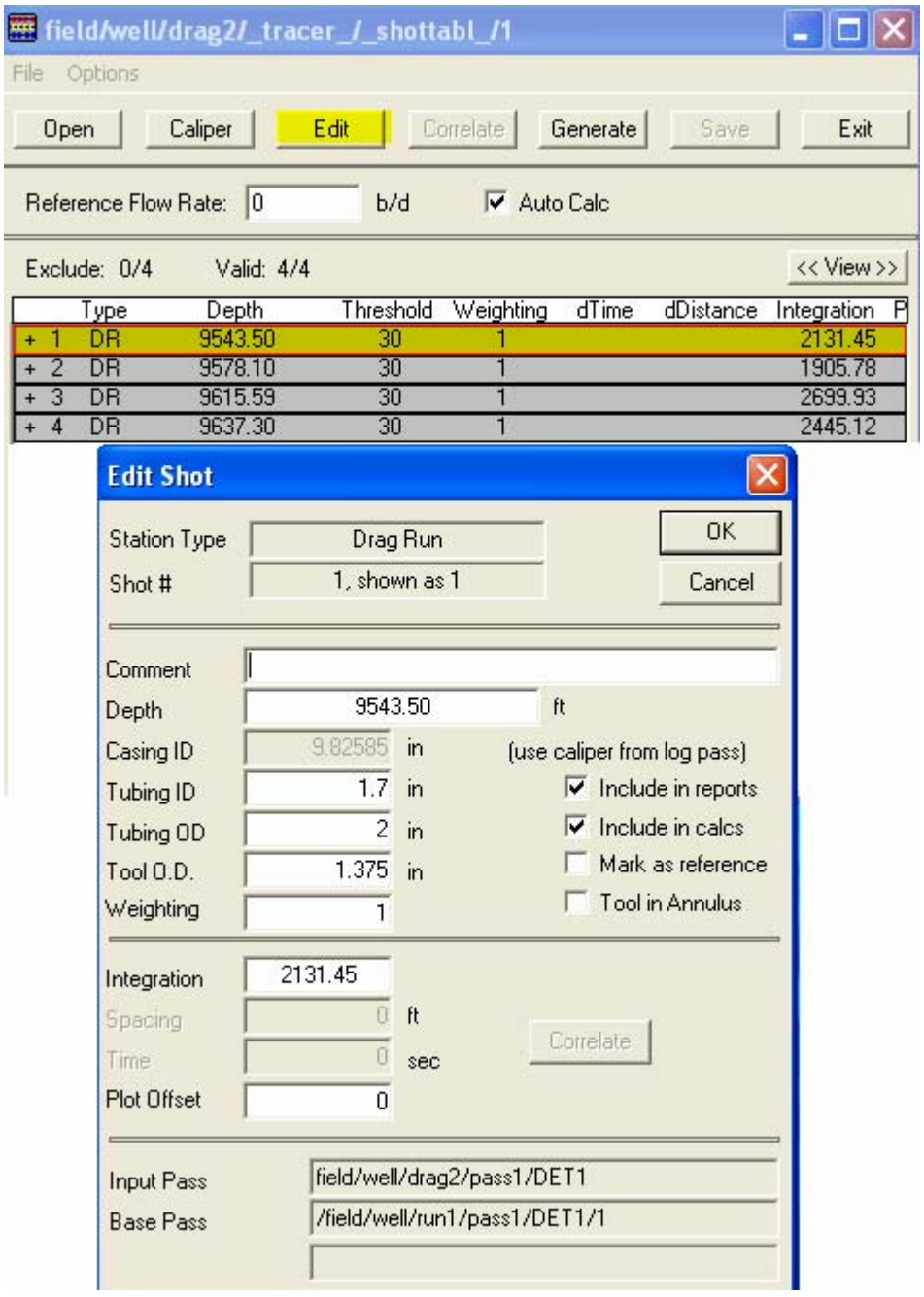


FIG: 24.11 edit shot

If a Dual Detector method or velocity shots from drag runs was used, the data recorded will have to be correlated before times will be computed. Shots that have not been computed will be tagged with a question mark (?). Click on a shot pass to select it, then click on correlate to open the correlation process box.

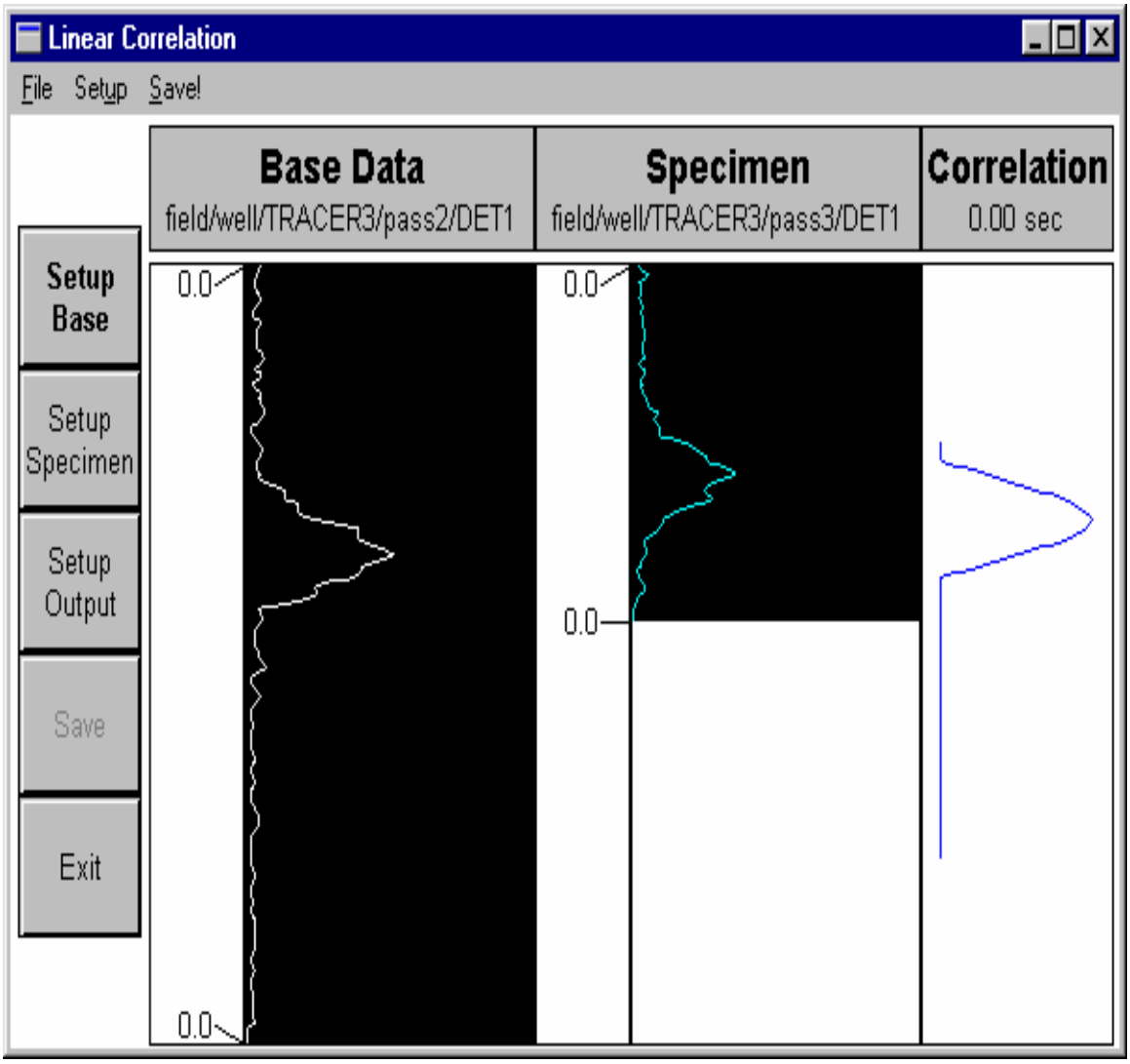


FIG: 24.12 Liner Correlation

Normally the selected base curve, specimen curve, and output curve will be setup. There are options to select different curves to be used if desired. On the base data, click and drag on the portion of the data that you think is valid, if the whole pass looks good, this step may be skipped. On the specimen data, click and drag on the portion of the data that is valid. The length of this data MUST be less than the length of the base data.
It is important that the whole response to the shot be selected since the calculations are done on the area under the curve and not on a given level.
Click Begin to compute the time. Click Save to retain the present calculations. Click Exit to return to the Shot table.
When all stations have been edited as desired, click on **Generate**. Choose Merged Composite File. Curves from a collar locator pass, a gamma ray pass, etc. may be added to the final presentation if desired. Finally when OK is clicked the flow rate presentation will be plotted out.

24.3 Service Specific - Tracer Survey

The Tracer service incorporates several special features that may require further explanation. The Warrior software attempts to calculate results from each pass of data as it is recorded or immediately afterwards.

24.3.1 Dual Detector Velocity

In **Dual Detector Velocity** mode the time displacement between the two curves is determined by a correlation technique. Any part or all of the data may be used to match the curves together. It is essential that complete event of the slug passing the detectors be recorded for this technique to be effective.

24.3.2 Single Detector Velocity

In **Single Detector Velocity** mode, the time from the ejector shot to a threshold crossing by the GR (or detector) curve is measured. If two detectors are in the tool string, the time measurement is made from the ejector shot to the first GR curve to cross the threshold.

24.3.3 Tracer

In **Tracer** the area between the designated GR (or detector) curve and either a baseline GR or a fixed level, is the primary measurement.
The results and other information are placed in a **Shot Table**. The contents of the shot table are used as a basis for the calculation of total and differential flow rates for display in tabular or log format.
When a Tracer survey is selected, **Edit/Tool Configuration/Tracer** brings up the **Tracer Configuration** window as shown below.

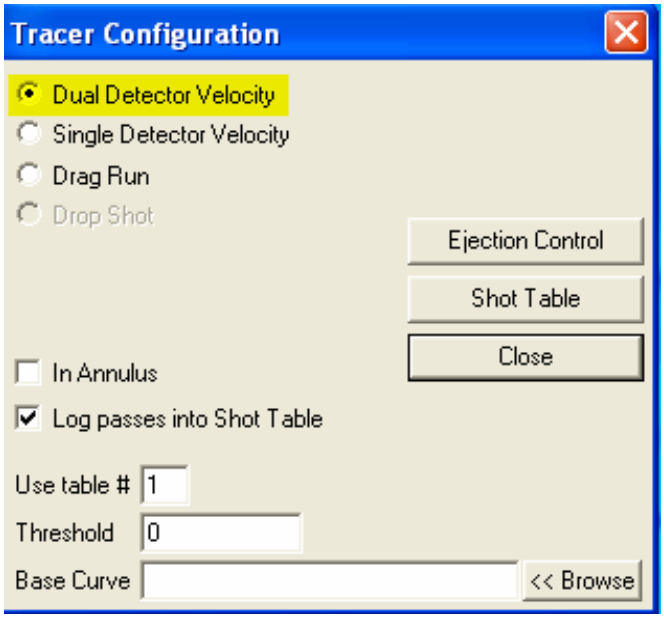


FIG: 24.13 Tracer Configuration

The user defines the type of survey to be run from a choice of Single or Dual Detector Velocity, or Tracer (Drop Run). This selection defines the type of on-line calculation that the software will attempt.
If the survey is being run in the annulus the **In Annulus** box should be selected on order that the correct calculations be made.
If it is required that the passes be inserted into the current shot table the **Log passes into Shot Table** should be selected. This would be the normal case to actually record the results and is the default.
More than one Shot Table may be defined for each survey.

24.3.4 Drag Run

Drag Run option is selected the user is asked to define which detector is to be used.

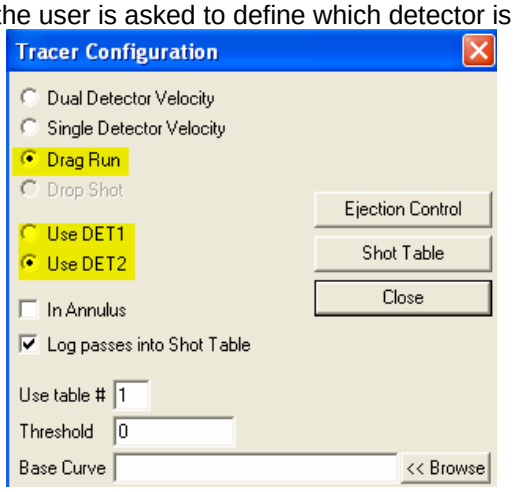


FIG: 24.14 Tracer Configuration

When two detectors are in the tool string and single detector velocity is selected the system will make calculations based on the first curve to cross the threshold.
When making calculations from the tracer passes (i.e. the area under the DET curve) it is necessary to define either a fixed threshold value or a baseline DET pass. The area under the DET curve and above the Threshold or
Base Curve is used to calculate the percentage of the original radioactive material passing the detector and the flow profile.
This information is defined in the **Threshold** or **Base Curve** fields.
To display the current **Shot Table** and/or **Tracer Ejection Control** window click on the appropriate button.

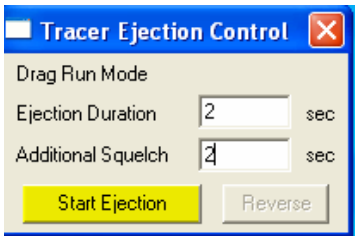


FIG: 24.15 Tracer Ejection Control

When running the service with the SDS interface panel the operator has the option to control the run time of the ejector motor from the Tracer Ejection Control window.
The length of time for each motor run is entered in the **Duration** dialog box. Clicking on the **Start Ejection** button changes the polarity of the line power for the time set in the Duration box.

24.3.5 Additional Squelch

The **Additional Squelch** field allows the user to set an additional dead time period in the DET curves after the ejector motor has run in order to avoid line noise appearing on the log. The time needed depends on various factors and is best set by trial and error.
The Tracer tool software module generates a curve called **EJECT** which shifts one unit to the right for the period of the ejection, thus indicating the occurrence and duration of the ejector motor run.
The survey is currently run by logging with the internal encoder simulator, however the actual depth is recorded as a curve named **ADEPTH**. This curve may be presented on the log in curve or tabular form, in order to indicate movement of the tool during the survey.
The elapsed time from the start of the survey is available via a curve named **ELTIM**.

Section

25

25 PANEX

25.1 Panex Monitor

The Panex Monitor will now appear when the service is loaded automatically. A few enhancements have been made.
It is now possible to change the downlink attenuation from the monitor (previously set in the script), the starting value will be whatever the script is set to. The default has now been set to 70%, this value seems to work fine on a large selection of cables we have tested on.
Also added are individual frame counts for each DSRO and a clear stats ("X") button, particularly helpful in determining the source of error frames when one particular DSRO is having problems only.

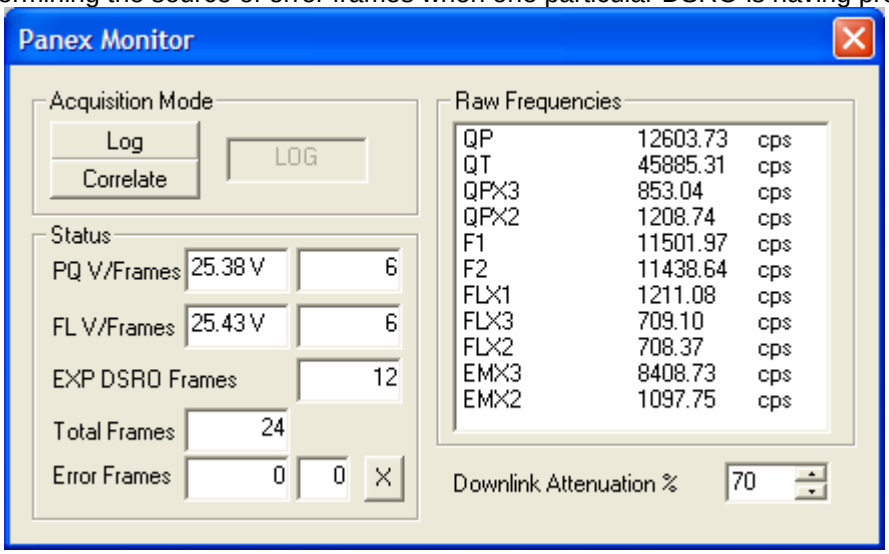


FIG: 25.1 Panex Monitor

The below settings work on a large selection of cable types and should be used in the future. Please change to these settings on your computer if they are not this way by default. (In Acquisition, Edit->Devices->SDSTIP). You may need to increase the Q value slightly on shorter (low impedence) lines.

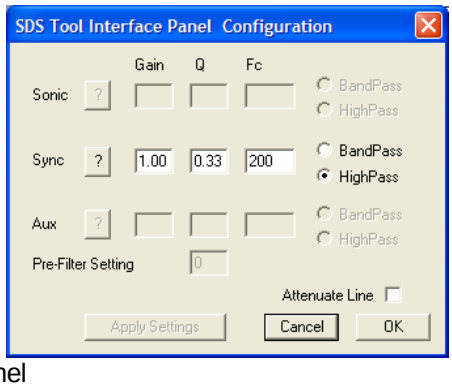


FIG: 25.2 SDS Tool Interface Panel

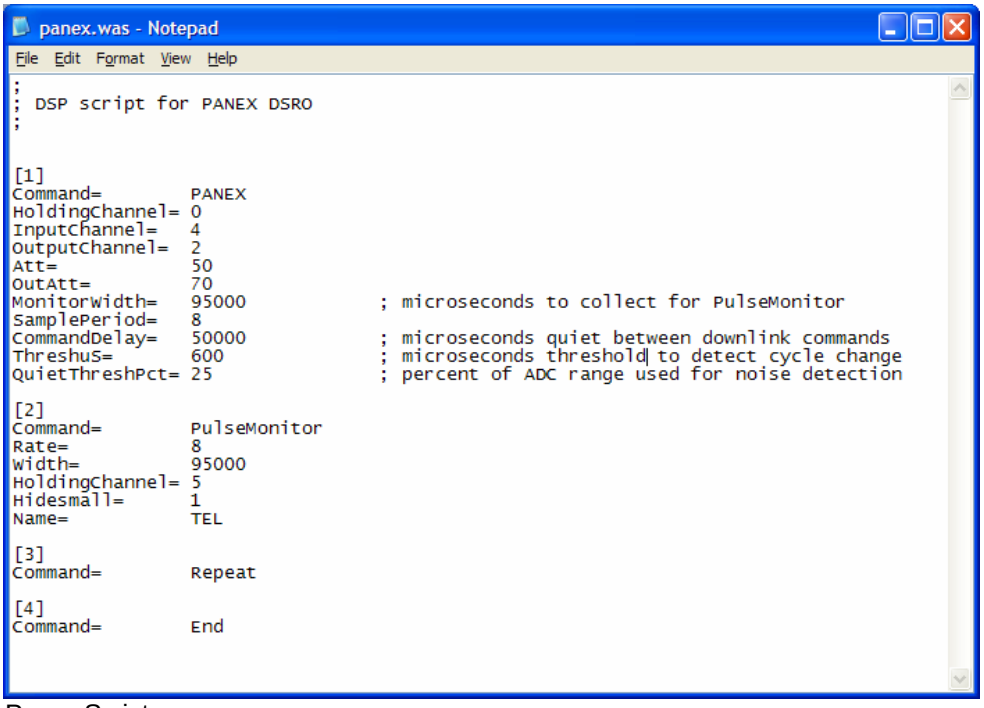


FIG: 25.3 Panex Script

The default script settings have been changed and have been tested on a large variety of cables.
In Acquisition it is possible to reset the C10 calibration coefficient (also editable via the Tool Editor). To access this Edit->Tool Configuration->PNX-FLOW. When this value is set to zero then C10 from the coefficient file will be used.

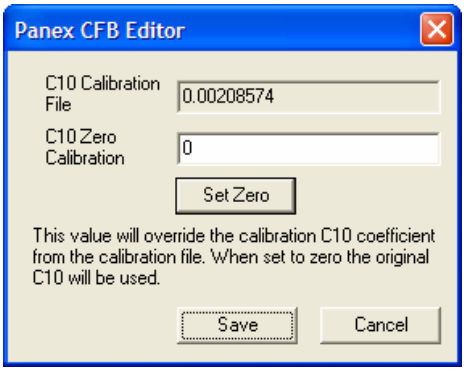


FIG: 25.4 Panex CFV Editor

Panex Gamma Ray tools are now supported, the TelID and C86 to C89 coefficients have to be entered in the Serial Number specific section of the tool editor and the CalbType has to be set to Panex.

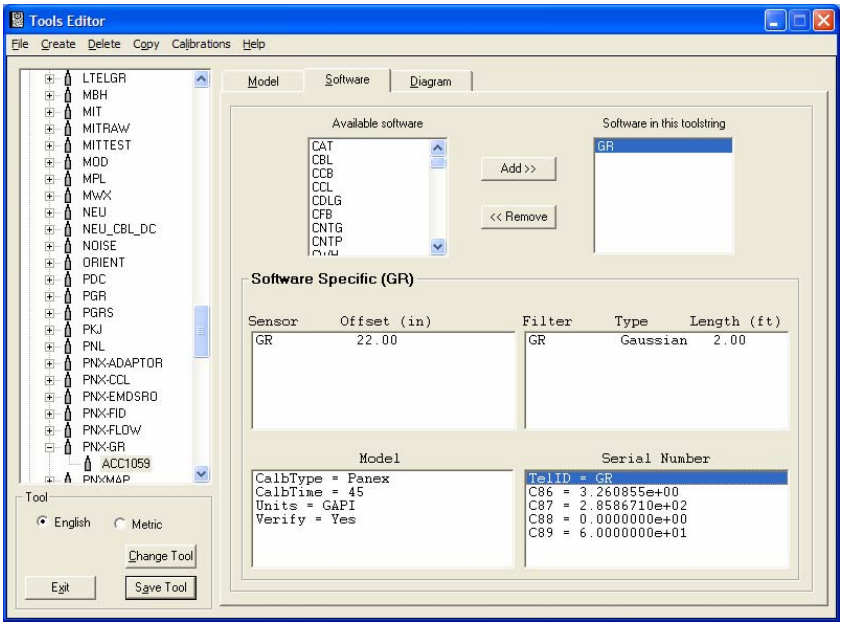


FIG: 25.5 GR Tool editor

25.2 Tool-strings:

CCL-EMDSRO-GR-ADAPTER-FID-QP-TLS-FLOW
GR-QP (you would invert the GR so the gold connector screws in to the QP)
GR-EMDSRO-TLS-ADAPTER-QP (invert the TLS and GR so the gold connectors screw in to the EMDSRO)
GR-EMDSRO-ADAPTER-TLS-QP (invert the GR so the gold connector screws in to the EMDSRO)
FID-QP-ADAPTER-GR-FLOW (invert the GR so that the gold connector screws in to the FLOW)
QP-ADAPTER-GR-FLOW (invert the GR so the gold connector screw in to the FLOW)
QP-GR-ADAPTER-FLOW (invert the QP so the gold connector of the GR screws in to the three conductor connector of the QP).

25.3 Adapters

Shows the two possible box connector ends, on the left there are three conductors and the right is one. The left would be like the top of the FLOW or QP tools. The right would be like the box end of a sensor tool like the TLS, GR or FID.

FIG: 25.6 Box Connector

This is the ADAPTER as used in the tool string; both ends are pin (external thread).

FIG: 25.7 Pin Connector

This is the sensor three conductor end of a sensor tool like the TLS, GR and FID. This end must connect to a DSRO (EMDSRO, QP or FLOW) in the 3 conductor box connection for the sensor reading to be read.

FIG: 25.8 Three Pin Connector

Box end of a DSRO where a sensor can connect to as an input.

FIG: 25.9 Three Box Connector

This is a coupling from the GR tool

FIG: 25.10 Gamma Ray Connector

Make sure that the sensor offsets are correct if you invert any tools

Section

26

26 Freepoint Service

The Warrior system supports Freepoint tools that do not require motorized deployment. This includes Applied Electronics Bowspring and Magnetic tools and Homco tools. Other models of Freepoint tools could also be setup in the Warrior system if the frequency of the transponder is known.

Be aware that the tool power and line termination passes through the Freepoint board. This means that the Freepoint board must be in the Warrior Interface panel or a jumper must be added between pins 10 and 12 on the connector for the Freepoint board. Also with the Freepoint board in the interface panel, the Routing codes for the system must be properly set up to allow the line to properly connect to the system. (Symptom of improper installation is having tool voltage but drawing no current in other services.)

26.1 FREEPOINT CONTROL PANEL

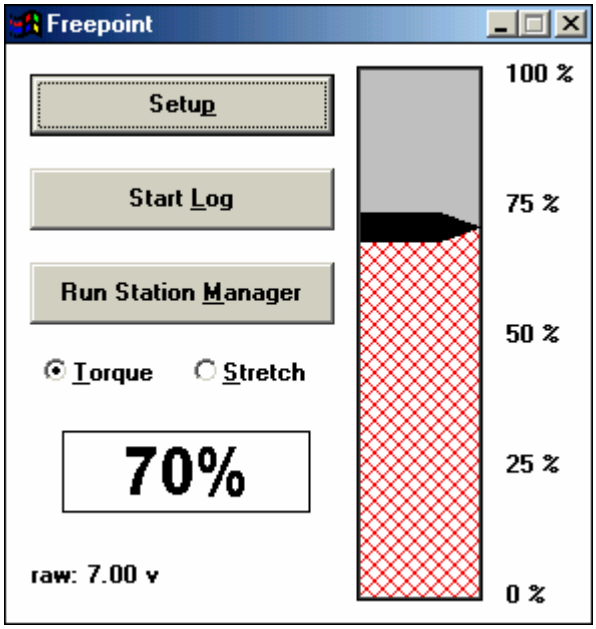


FIG: 26.1 Freepoint Control panel

When the Freepoint service is first started, the window show below will appear. This is the Freepoint service control panel. It shows a graphical representation of the Freepoint output and a text output. It has selection buttons that allow one to select whether the next station is to be run is to be torque or stretch. There are three large buttons that control the Freepoint tool setup, starting and stopping time log passes, and station manager access.

26.2 FREEPOINT TOOL SETUP

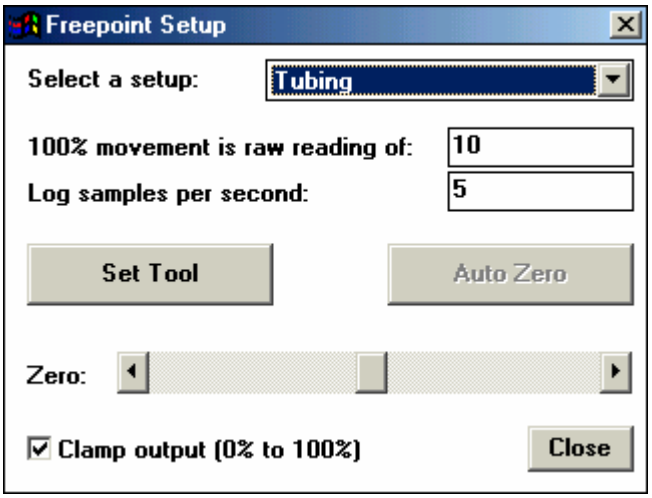


FIG: 26.2 Freepoint Setup

When the **Setup** button on the Freepoint control panel is pressed, the window shown below will appear. This is the Freepoint setup control panel. Up to five different setups may be saved. Which setup is used may be selected by clicking on the dropdown box and choosing from Heavy Drill Pipe, Drill Pipe, Large Casing, Small Casing, and Tubing. Any changes made to the log sample rate or reading for 100% movement will be saved to the setup that has been selected.
A normal sample rate for the log should be set to 5 to 10 samples per second.
The 100% movement box is used to control the sensitivity of the response similar to the gain knob on an analog panel. Note that the lower the number the more sensitive the response will become. This does not have to be a whole number and may contain a decimal point (2.75 would be valid).
The Set Tool button engages a relay in the interface panel and temporarily applies a DC voltage to the line to set the Applied Freepoint tool. Note that the tool power switch on the interface panel must be on to do this but the tool power adjustment potentiometers should be turned to 0.00.
The Zero slide bar is used to set the zero position of the output before the log pass is started and torque or stretch is applied to the casing.
There is an optional check box to clamp the Freepoint output to 0% to 100% so that it does not go off of the page on the log.

26.3 Running the Service

Once the Freepoint service has been selected and the tool lowered into the well to a depth where the casing is known to be free, the tool should be set and the output zeroed. Stretch or torque should be put on the casing and the 100% movement number adjusted to get near a 100% output reading.
This should be repeated until you are satisfied that the equipment is responding correctly in free pipe. Once satisfied, the 100% Movement number should not be changed while recording stations.
You are now ready to record the first station. Click the Start Log button on the Freepoint Control panel. The system will start recording on time. Have the rig apply torque or stretch and the output will be recorded. When you have seen the tool response, click the Stop Log button to stop the pass. The minimum and maximum Freepoint readings will be entered into the Station Manager table at the encoder depth (note that since the encoder depth is used, the log cannot be simulated using the depth simulator. You can only simulate a log by using the encoder and resetting the depth before each pass).
Drop down the well to the depth that you wish to make the next pass and repeat the process. Make as many passes as desired to determine the Freepoint location in the well. Each pass will have the maximum output entered into the station manager table.

The depths at which you run the stations do not have to be in descending order. You would normally start at the top of the well, and start doing stations going down. Once stuck pipe is found, you can come back up to a depth between there and your last free pipe station to refine the stuck depth. What ever order the stations are run, they will be entered into the Station Manager table in descending order.

26.3.1 Station Manager

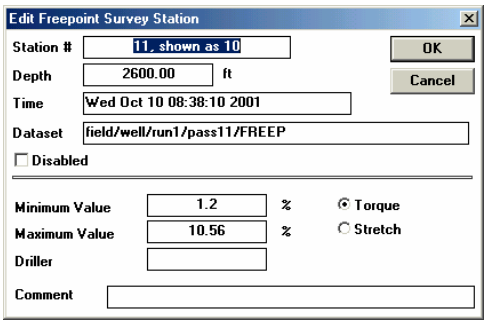
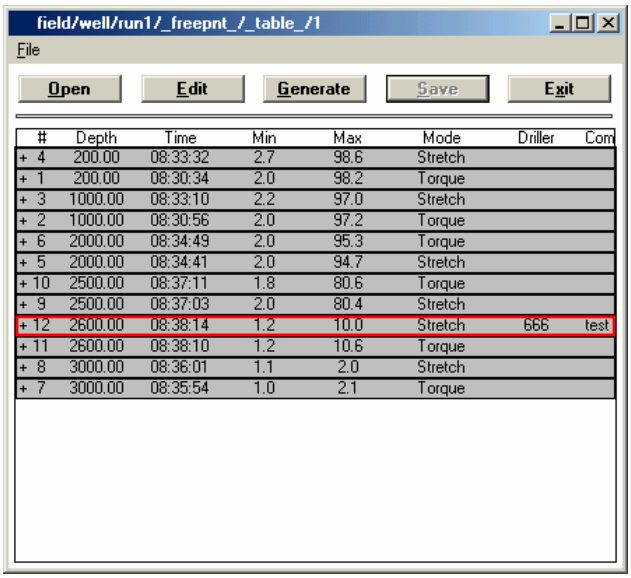


FIG: 26.3 Freepoint Survey Station



#	Depth	Time	Min	Max	Mode	Driller	Com
+ 4	200.00	08:33:32	2.7	98.6	Stretch		
+ 1	200.00	08:30:34	2.0	98.2	Torque		
+ 3	1000.00	08:33:10	2.2	97.0	Stretch		
+ 2	1000.00	08:30:56	2.0	97.2	Torque		
+ 6	2000.00	08:34:49	2.0	95.3	Torque		
+ 5	2000.00	08:34:41	2.0	94.7	Stretch		
+ 10	2500.00	08:37:11	1.8	80.6	Torque		
+ 9	2500.00	08:37:03	2.0	80.4	Stretch		
+ 12	2600.00	08:38:14	1.2	10.0	Stretch	666	test
+ 11	2600.00	08:38:10	1.2	10.6	Torque		
+ 8	3000.00	08:36:01	1.1	2.0	Stretch		
+ 7	3000.00	08:35:54	1.0	2.1	Torque		

FIG: 26.4 Freepoint Table

As each station is run, the minimum and maximum values are placed into the station manager table. Notice that the stations can be done in any order but are placed into the table in descending order.
Once a station has been entered into the table. It can be viewed and edited. Any field except the station # can be edited. This can be useful to make your final presentation more acceptable. There is a check box to disable the station so that it will not be included in the final log presentation in the event that the tool slipped or something else occurred to make the station invalid.
When all of the stations have been edited as desired, the final log presentation can be made by clicking the **Generate** button, and then click the **Depth Log** button.

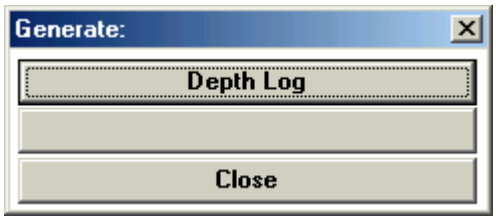


FIG: 26.5 Generate

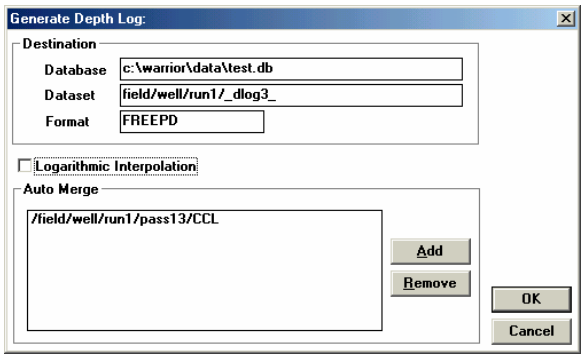


FIG: 26.6 Generate Depth

There is a check box for Logarithmic Interpolation that will produce a slight smoothing effect to the output curves. Additional curves from the same database, such as a CCL or gamma ray, can be auto merged into the output. When the **OK** button is clicked, the interactive plot will be presented on a ½" /100' scale.

Using the Plot Job Editor, a presentation can now be made for the customer. This will normally include a heading, the Freepoint survey table, the generated depth log. The individual station passes could also be included and a tool string diagram if desired.

Section

27

27 Freepoint Service Howco-GO

The Warrior system supports Freepoint tools that require minimum DC voltage for motorized deployment. This includes Applied Electronics Bowspring and Magnetic tools, and Homco tools. Other models of Freepoint tools could also be setup in the Warrior system if the frequency of the transponder is known.

Be aware that the tool power and line termination passes through the Freepoint board. This means that the Freepoint board must be in the Warrior Interface panel or a jumper must be added between pins 10 and 12 on the connector for the Freepoint board. Also with the Freepoint board in the interface panel, the Routing codes for the system must be properly set up to allow the line to properly connect to the system. (Symptom of improper installation is having tool voltage but drawing no current in other services.)
Frequency style tools such as Homco and Gearhart do not require the use of the
Freepoint Board. Signals are processed through the DSP in much the same manner as pulse type tools.

27.1 FREEPOINT CONTROL PANEL

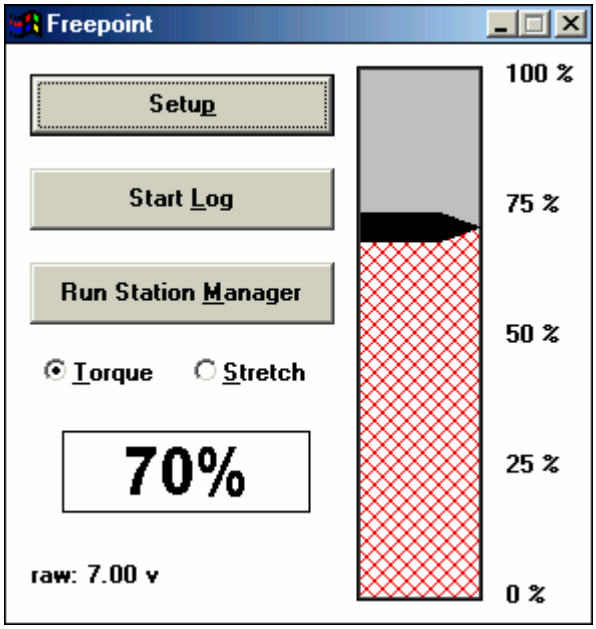


FIG: 27.1 Freepoint Control panel

When the Freepoint service is first started, the window show below will appear. This is the Freepoint service control panel. It shows a graphical representation of the Freepoint output and a text output. It

has selection buttons that allow one to select whether the next station is to be run is to be torque or stretch. There are three large buttons that control the Freepoint tool setup, starting and stopping time log passes, and station manager access.

27.2 FREEPOINT TOOL SETUP

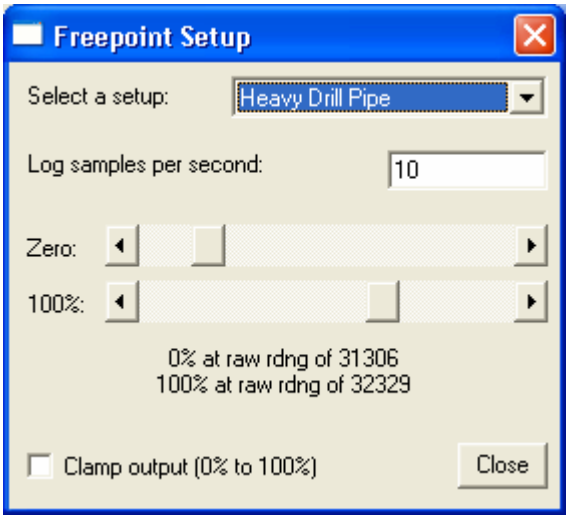


FIG: 27.2 Freepoint Setup

When the **Setup** button on the Freepoint control panel is pressed, the window shown below will appear. This is the Freepoint setup control panel. Up to six different setups may be saved. Which setup is used may be selected by clicking on the dropdown box and choosing from Heavy Drill Pipe, Drill Pipe, Large Casing, Small Casing, collars, and Tubing. Any changes made to the log sample rate or reading for 100% movement will be saved to the setup that has been selected.
A normal sample rate for the log should be set to 5 to 10 samples per second.
The Zero slider bar is used to set the frequency for when no torque or stretch is applied. The 100% slider bar is used to set the frequency for the maximum Torque or Stretch to be used.
There is an optional check box to clamp the Freepoint output to 0% to 100% so that it does not go off of the page on the log.

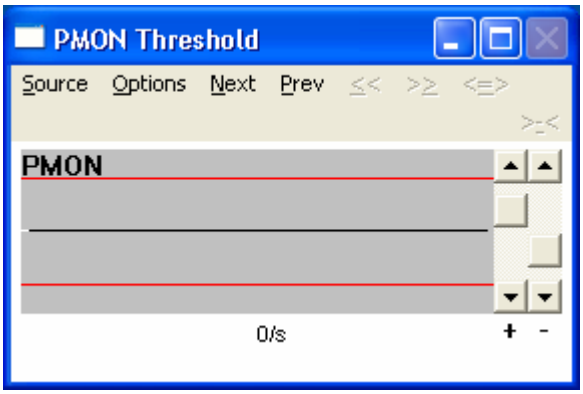


FIG: 27.3 Freepoint PMON Threshold

Remember that the signals in the PMON (pulse monitor) window need to be discriminated properly, similar to a gamma/ neutron service.

27.3 Running the Service

Once the Freepoint service has been selected and the tool lowered into the well to a depth where the casing is known to be free, the tool should be set and the output zeroed. Stretch or torque should be put on the casing and the 100% movement number adjusted to get near a 100% output reading.
This should be repeated until you are satisfied that the equipment is responding correctly in free pipe. Once satisfied, the 100% Movement number should not be changed while recording stations.
You are now ready to record the first station. Click the Start Log button on the Freepoint Control panel. The system will start recording on time. Have the rig apply torque or stretch and the output will be recorded. When you have seen the tool response, click the Stop Log button to stop the pass. The minimum and maximum Freepoint readings will be entered into the Station Manager table at the encoder depth (note that since the encoder depth is used, the log cannot be simulated using the depth simulator. You can only simulate a log by using the encoder and resetting the depth before each pass).
Drop down the well to the depth that you wish to make the next pass and repeat the process. Make as many passes as desired to determine the Freepoint location in the well. Each pass will have the maximum output entered into the station manager table.
The depths at which you run the stations do not have to be in descending order. You would normally start at the top of the well, and start doing stations going down. Once stuck pipe is found, you can come back up to a depth between there and your last free pipe station to refine the stuck depth. What ever order the stations are run, they will be entered into the Station Manager table in descending order.

27.3.1 Station Manager

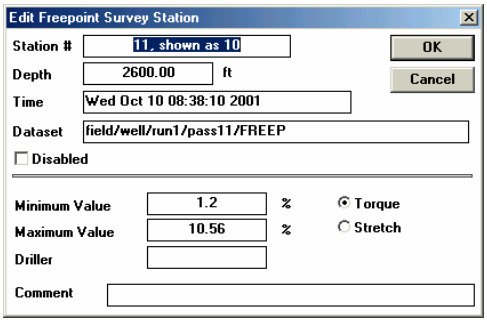
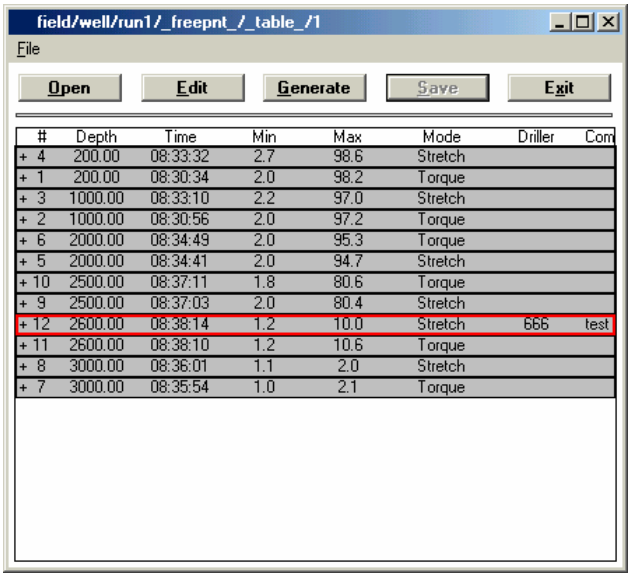


FIG: 27.4 Freepoint Survey Station



#	Depth	Time	Min	Max	Mode	Driller	Com
+ 4	200.00	08:33:32	2.7	98.6	Stretch		
+ 1	200.00	08:30:34	2.0	98.2	Torque		
+ 3	1000.00	08:33:10	2.2	97.0	Stretch		
+ 2	1000.00	08:30:56	2.0	97.2	Torque		
+ 6	2000.00	08:34:49	2.0	95.3	Torque		
+ 5	2000.00	08:34:41	2.0	94.7	Stretch		
+ 10	2500.00	08:37:11	1.8	80.6	Torque		
+ 9	2500.00	08:37:03	2.0	80.4	Stretch		
+ 12	2600.00	08:38:14	1.2	10.0	Stretch	666	test
+ 11	2600.00	08:38:10	1.2	10.6	Torque		
+ 8	3000.00	08:36:01	1.1	2.0	Stretch		
+ 7	3000.00	08:35:54	1.0	2.1	Torque		

FIG: 27.5 Freepoint Table

As each station is run, the minimum and maximum values are placed into the station manager table. Notice that the stations can be done in any order but are placed into the table in descending depth order.
Once a station has been entered into the table. It can be viewed and edited. Any field except the station # can be edited. This can be useful to make your final presentation more acceptable. There is a check box to disable the station so that it will not be included in the final log presentation in the event that the tool slipped or something else occurred to make the station invalid.
When all of the stations have been edited as desired, the final log presentation can be made by clicking the **Generate** button, and then click the **Depth Log** button.

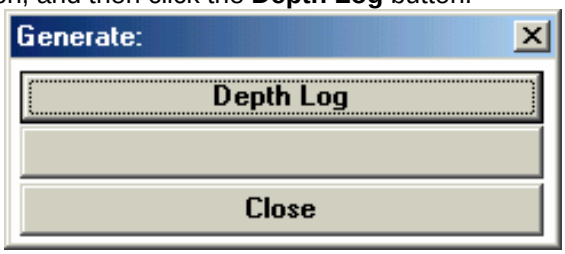


FIG: 27.6 Generate

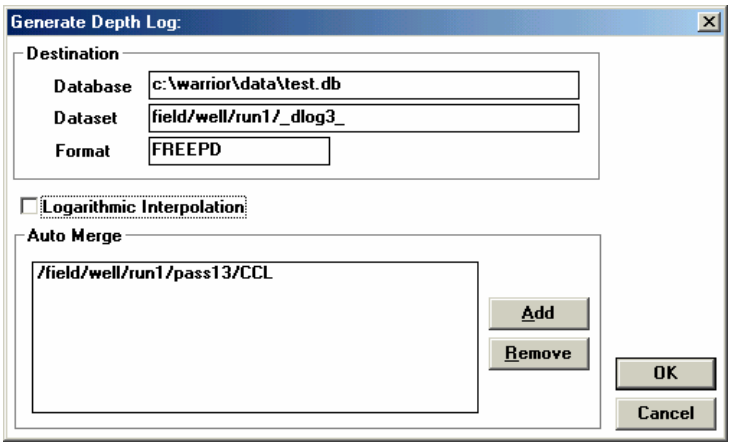


FIG: 27.7 Generate Depth

There is a check box for Logarithmic Interpolation that will produce a slight smoothing effect to the output curves. Additional curves from the same database, such as a CCL or gamma ray, can be auto merged into the output. When the **OK** button is clicked, the interactive plot will be presented on a ½" /100' scale.
Using the Plot Job Editor, a presentation can now be made for the customer. This will normally include a heading, the Freepoint survey table, and the generated depth log. The individual station passes could also be included and a tool string diagram if desired.

Section

28

28 Bond Index and Borehole Volume

28.1 BL Attenuation and Bond Index arithmetic

Bond index is the ratio of measured attenuation to maximum attenuation.

28.2 Calculation parameters

28.2.1 fMxAmp

Maximum expected amplitude; should be the same as the free pipe
Reference value used in calibration.
Obtained from zoned variable MAXAMPL. If the zero is entered then a value is calculated from the casing O.D.

28.2.2 fMnAmp

Minimum expected amplitude; should be the same as the zero signal
used in calibration except for one caveat: Zero is not a valid
value, even though it is commonly used for calibration. Suggest
using a value of one millivolt for both.
Obtained from zoned variable MINAMPL.

28.2.3 fMnAtt:

Minimum attenuation. Attenuation value expected to be measured in free pipe.
Obtained from zoned variable MINATTN. SPE papers suggest a value of 0.8 as an overall average for common casing sizes and weights.

28.2.4 fLogValue:

Calibrated log amplitude. (each sample). Transmitter/receiver spacing is assumed to be 3 feet.

28.3 Outputs:

28.3.1 fAtt:

Calculated output attenuation.

28.3.2 fBI:

Calculated output Bond Index.

28.4 Processing for each log sample: (math protection not shown)

ffRatio = fLogValue / fMxAmp;

fAtt = 20.0 / 3.0 * log(fRatio) - fMnAtt;

fRatio = fMnAmp / fMxAmp;

fBI = fAtt / (20.0 / 3.0 * log(fRatio) - fMnAtt);

28.5 BOREHOLE VOLUME

From Warrior Utilities select 'Edit Logging Tool Details'. From the Edit Tool drop down box select 'STD' Tool. From the Serial Number drop down box select the serial number of the STD tool.

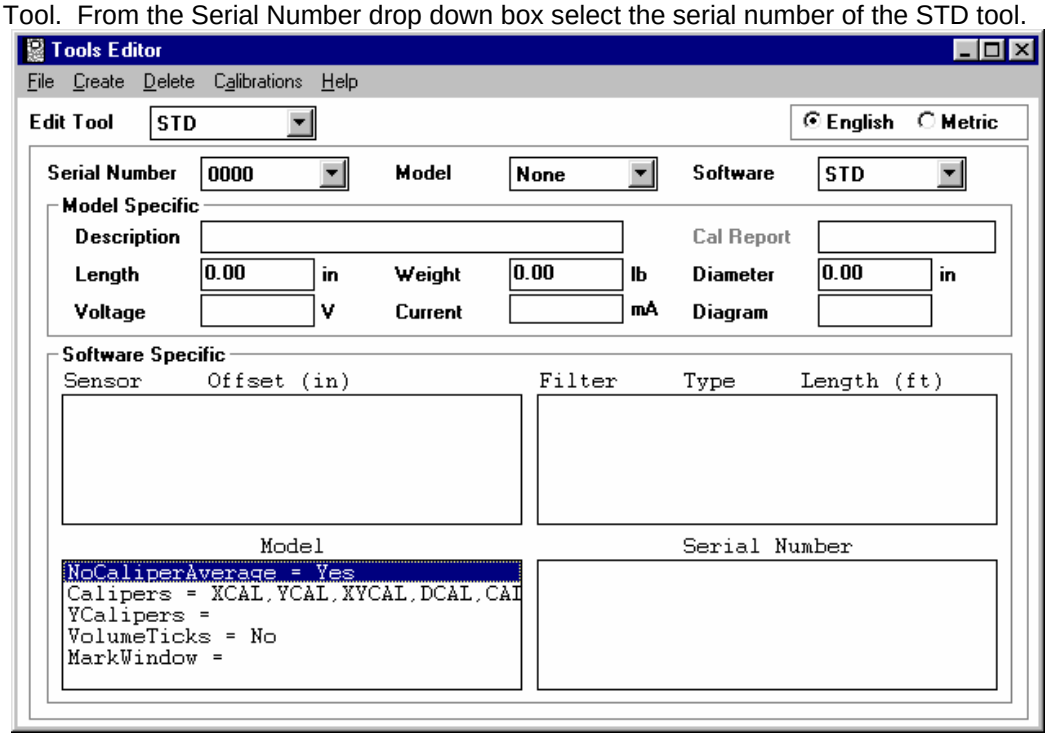


FIG: 28.1 Tools editor

Double click on the 'Calipers=' line. Enter a list of any output names, from all of your different services that should be used as main ('X') caliper inputs into the borehole volume calculation. Separate multiple names by commas.

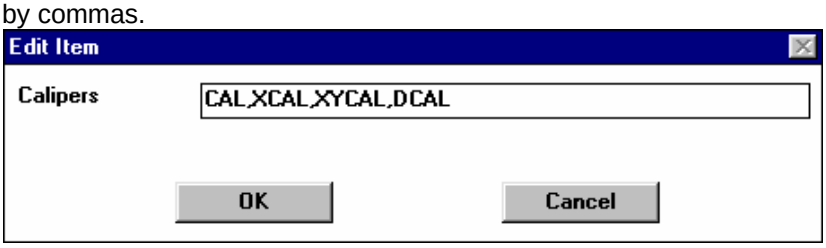


FIG: 28.2 Edit item

Repeat for the YCalipers line. Y calipers measure perpendicularly to X calipers and allow a better calculation with an elliptical hole.

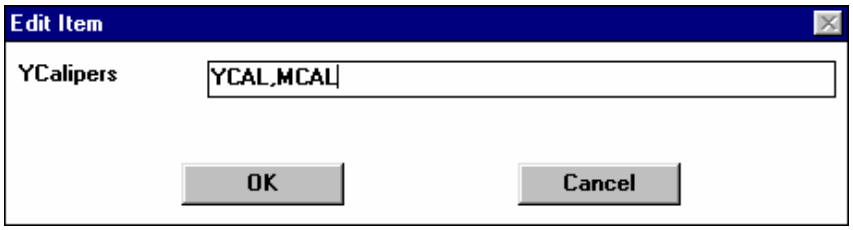


FIG: 28.3 Edit Y Caliper

If any service has more than one X or more than one Y caliper then those readings will be averaged unless the NoCaliperAverage flag is set to Yes.
Double click on the 'VolumeTicks =' Line.
Select **'YES'** if you want volume ticks displayed instead of a tabular output.
Each small tick equals 10 cubic feet or 1 cubic meter. Each large tick equals 10 small ticks.
Select '**NO**' if you want a tabular output for volume.
You can get either ticks or tabular volume, not both.

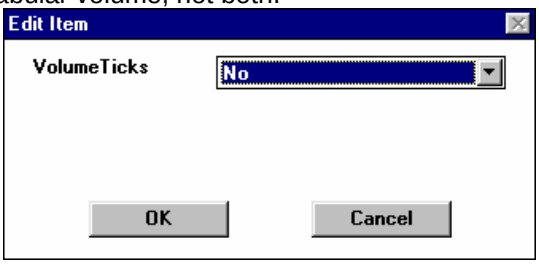


FIG: 28.4 Edit Volume Ticks

From Acquisition 'Edit Variables' the 'BOREID' size and 'CASEOD' size must be entered correctly for a valid calculation of borehole volume.
A total borehole volume curve 'TBHV' must be added to the Log format as follows:

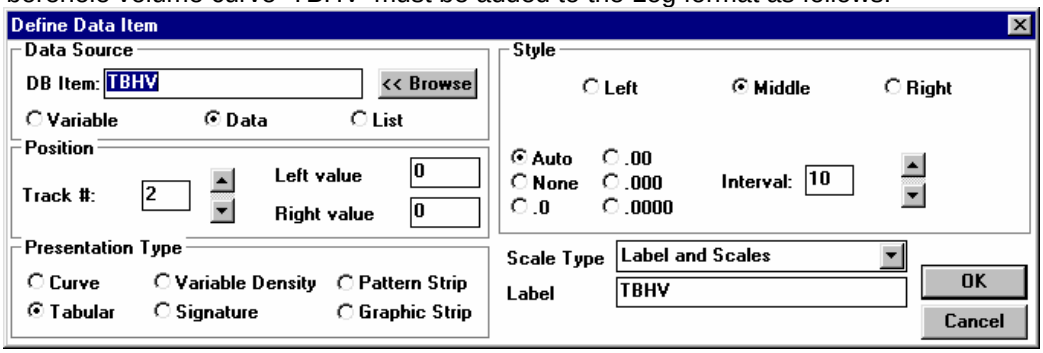


FIG: 28.5 Define Data Item

An annular bore hole volume curve 'ABHV' needs to be added to the log format as follows:

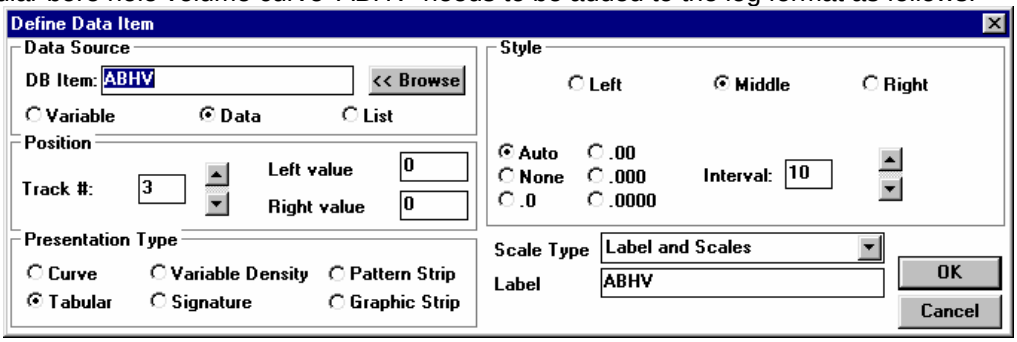


FIG: 28.6 Set Scales Data Item

Section

29

29 CSS Radial Bond Services

Computer Sonics produces two types of radial bond tool. One (the earlier model, though still produced) is known as the sequential tool. This tool has four modes of operation:
3 ft.- 5 ft. mode for generating the conventional dual spaced CBL radial mode for generating the eight receiver radial bond log (RBL)
calibration mode for generating the internal calibration signal open hole mode
The tool is switched from mode to mode and to acquire data for a complete log two passes must be made over the log interval, one in CBL mode and one in RBL.
The later tool model generates all the required signals simultaneously and is known as the multiplexed tool.
Both tools transmit nuclear, collar, and temperature log data in a digital form interleaved with analog sonic data. The telemetry scheme employed is not the same for the two tools, however in both cases it is detected and decoded in the Warrior system by DSP software through selection of the appropriate script command.
The sequential tool transmits acoustic signals on the wireline at their natural frequency (approximately 20 – 25 kHz). The multiplexed tool divides the downhole frequency by a factor of four before transmission to the surface, therefore the frequency of the tool signals on the line is approximately 6 kHz. Special provision must be made for this feature in the logging system in the form of a special filter / amplifier card that can be switched to accommodate conventional as well the CSS multiplexed tool.
In both tools CSS has provided an internal calibration signal which can be used for a well site calibration which does not rely on finding (assuming) free pipe in the well. For both tools the philosophy is the same, namely the tool is calibrated in a known environment (zero signal and a calibration pipe) and the internal calibrate signal evaluated. The calibrations for all the receivers and the value of the internal calibration signal are recorded by tool serial number. This procedure is termed the shop or master calibration. At the well site the receiver zero signals and internal calibration signal are re-evaluated and corrections made to reproduce the readings obtained during the shop calibration. In this way any changes in signal amplitudes due to electronic drift, differences in wireline and other factors may be minimized.
The 3 ft receiver signal curve is calibrated to industry standard values. The sector signals are normalized to a given log amplitude during the shop calibration for calibration pipe diameter. When logging casing of other diameters the sector amplitudes are adjusted to produce the same log deflection and cement map appearance.

29.1 SDSTIP

The gains and filters for the CSS tools should be setup as follows:
From Acquisition Window Select ‘Edit/Device Configuration/SDSTIP’
For the CSSM 1 11/16” tool, with Short to medium lines the following values should be entered in the SDSTIP Panel.

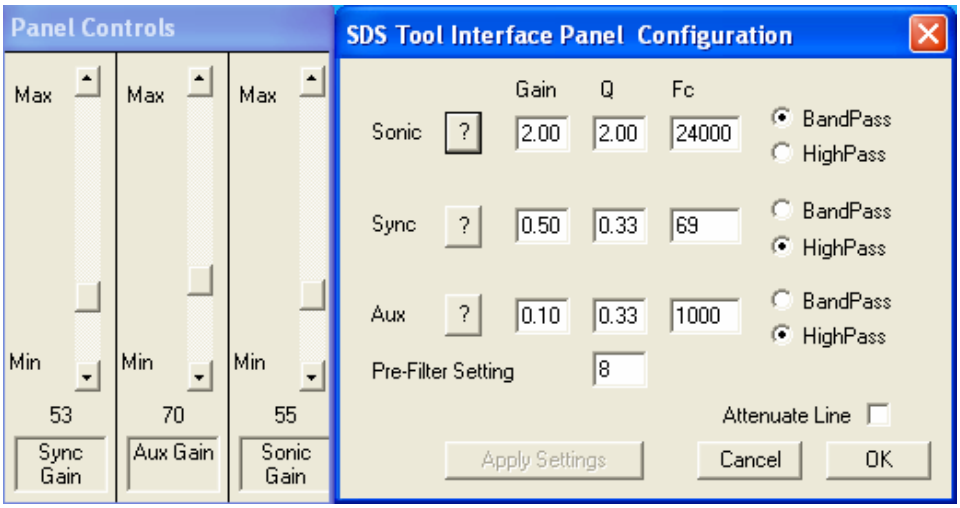


FIG: 29.1SDS Tool Interface Panel Configurations 1 11/16 Short to Medium Lines

The Gains set the maximum gain for the Panel Control Slider bars and should be set to give a usable range for the slider bars depending on line length and tool signal.
The Sonic line is for the Sonic signal.
The Sync line is for the Sync signal.
The Aux line is for the Telemetry signal.
The FC is the frequency of the signal being detected. The Q is the sharpness of the filter, the higher the Q the sharper the cutoff frequency. Band Pass or High Pass is the type filter used.
The FC for the Sonic Line should be set for the frequency of the sonic receiver crystals, with a Band Pass Filter.
The FC for the Sync Line usually works best with a low Q and Low FC, with a High Pass Filter.
The FC for the Aux Line has been tested for short to medium lines and medium to long lines, and should be entered as shown.
For the CSSM 1 11/16" tool, with medium to long lines the following values should be entered in the SDSTIP Panel.

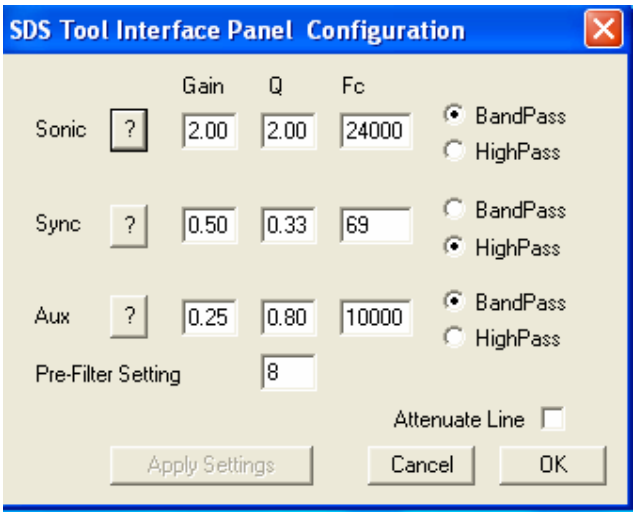


FIG: 29.2 SDS Tool Interface Panel Configurations 1 11/16 Medium to Long Lines

For the CSSM 3 1/8" tool, with short to medium lines the following values should be entered in the SDSTIP Panel.

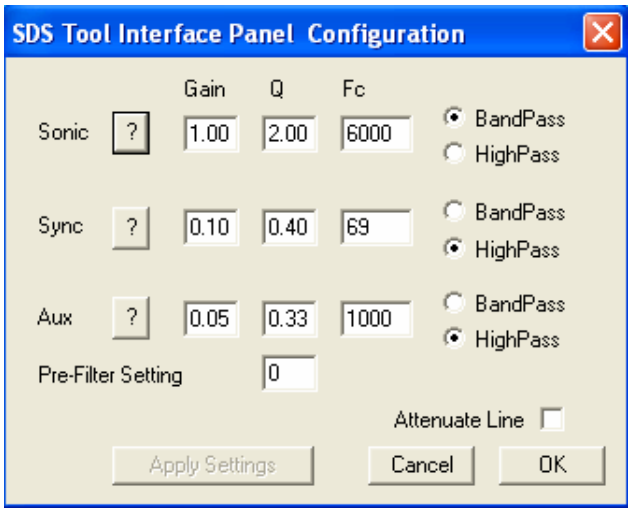


FIG: 29.3 SDS Tool Interface Panel Configurations 3 1/8 Short to Medium Lines

For the CSSM 3 1/8" tool, with medium to long lines the following values should be entered in the SDSTIP Panel.

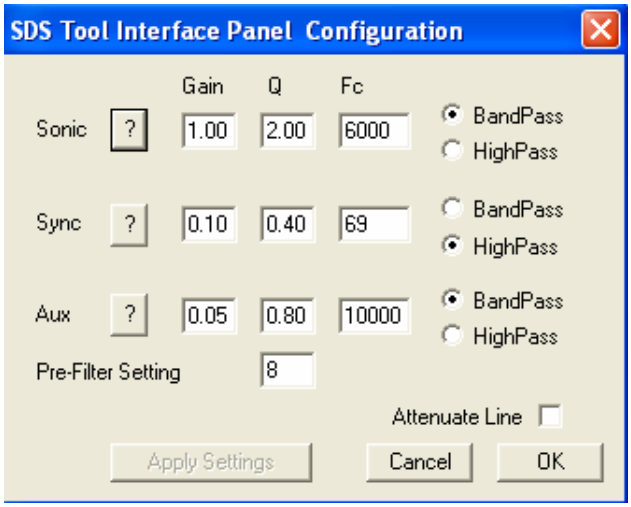


FIG: 29.4 SDS Tool Interface Panel Configurations 3 1/8 Medium to Long Lines

These values are not set and stone and may have to be tweaked for individual situations.

29.2 Acquisition

After starting Acquisition, the first step when running a Bond Tool of any type on Warrior will be to set the proper casing size.. This will ensure that the gates will default to the correct saved settings.

29.2.1 Edit

Click on the Edit menu box of the Warrior Logging System menu box and scroll down to and select Variables.

29.2.2 Variables

Displays the Variable (parameter) editor window, enabling depth dependent parameters associated with the selected service to be zoned and values to be set.

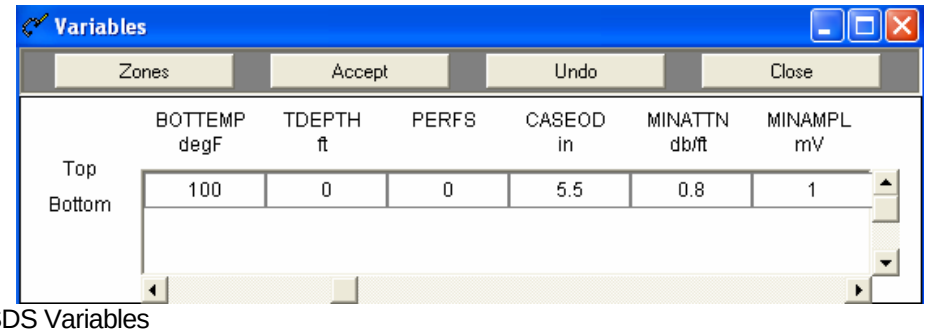


FIG: 29.5 SDS Variables

Check the proper Casing OD under CASEOD. If you are outputting a Bond Index curve, enter the Minimum and Maximum Amplitudes. Enter any other variables that may be required. Then push the Accept button.

The Minimum and Maximum Amplitude values are used for calculating the Bond Index Curve. Of these values the MINAMPL will have the greatest impact upon the calculations. The proper values are listed in Appendix A. Also, the MINATTN value is typical for most standard casings.

Warning!

29.2.3 Edit Logging Services Details

From the Warrior Logging System menu box, click on Services and select the proper service for the tool type. Tools have different telemetry schemes and the services must be set up to match the telemetry.

29.2.4 Edit logging Tools details

When the Service is selected the Edit Toolstring Window will come up automatically. Or, select Edit and Tool String, to display the following window:

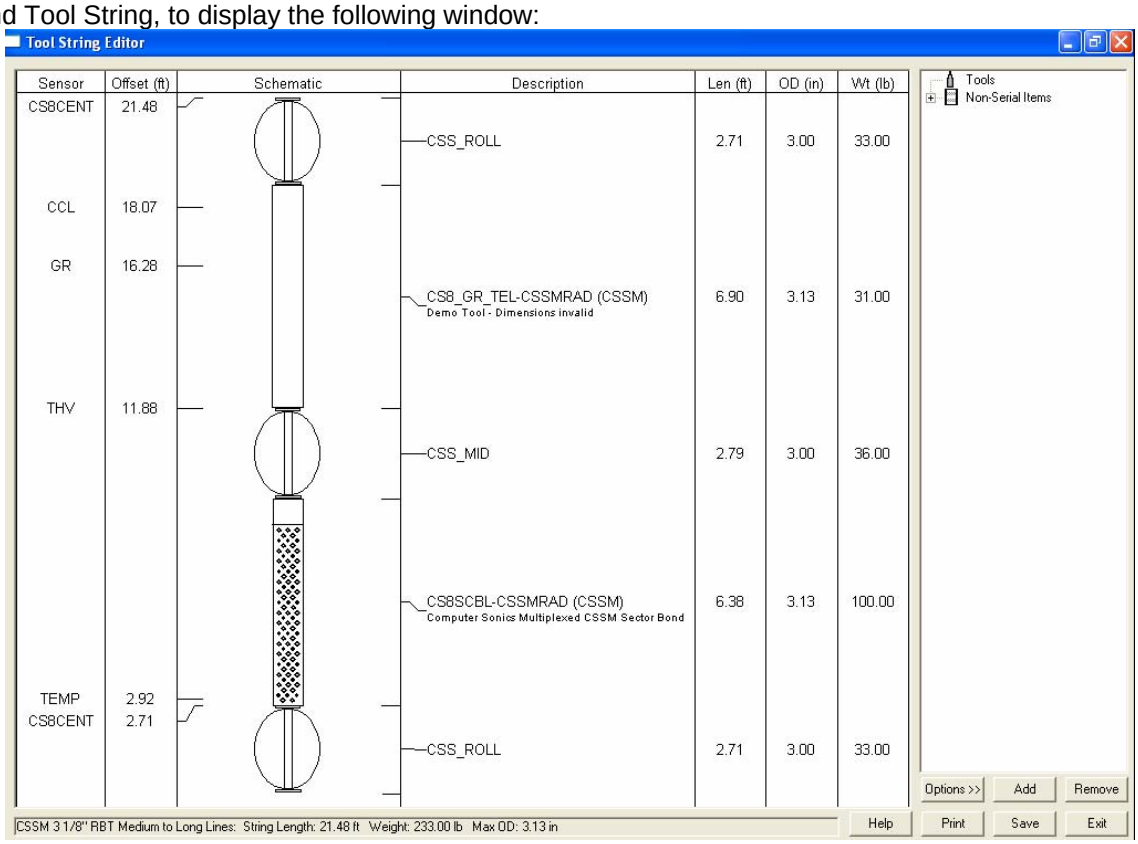
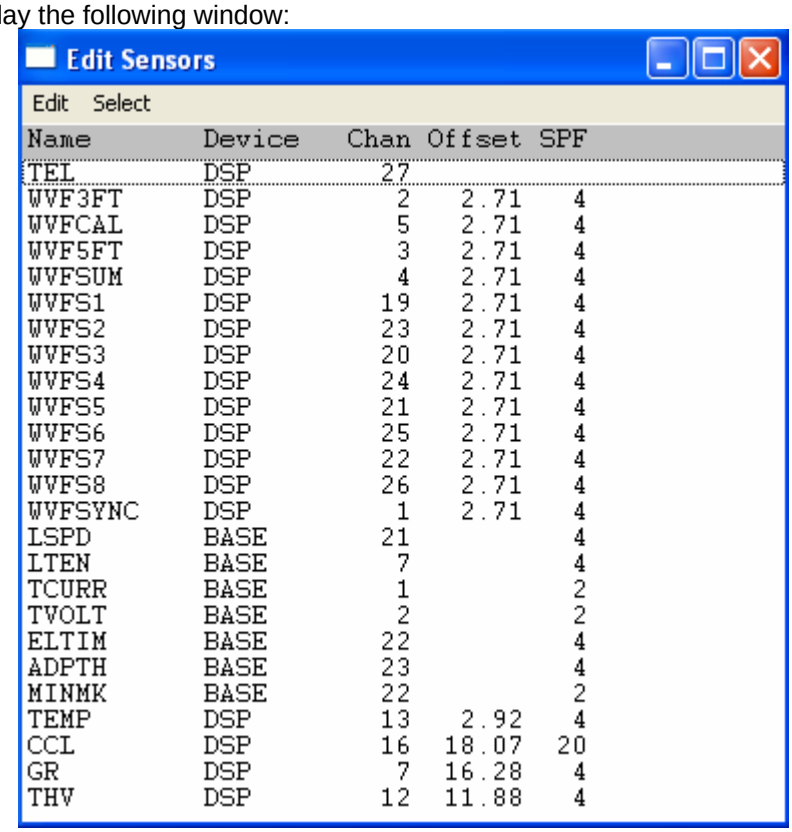


FIG: 29.6 Toolstring

From this window it is possible to change the tool being run, the order of the tools in the string, and add or delete centralizers, weight bars, knuckle joints or other tool string components. It is from the information set in this window that the calibrations, default offsets and filters settings for the log to be run are derived.

29.2.5 Tool String

Depth offsets that were derived from the Edit - Tool String step may be viewed by choosing Edit - Sensors, to display the following window:



Name	Device	Chan	Offset	SPF
TEL	DSP	27		
WVF3FT	DSP	2	2.71	4
WVFCAL	DSP	5	2.71	4
WVF5FT	DSP	3	2.71	4
WVFSUM	DSP	4	2.71	4
WVFS1	DSP	19	2.71	4
WVFS2	DSP	23	2.71	4
WVFS3	DSP	20	2.71	4
WVFS4	DSP	24	2.71	4
WVFS5	DSP	21	2.71	4
WVFS6	DSP	25	2.71	4
WVFS7	DSP	22	2.71	4
WVFS8	DSP	26	2.71	4
WVFSYNC	DSP	1	2.71	4
LSPD	BASE	21		4
LTEN	BASE	7		4
TCURR	BASE	1		2
TVOLT	BASE	2		2
ELTIM	BASE	22		4
ADPTH	BASE	23		4
MINMK	BASE	22		2
TEMP	DSP	13	2.92	4
CCL	DSP	16	18.07	20
GR	DSP	7	16.28	4
THV	DSP	12	11.88	4

FIG: 29.7 Edit Sensors

These offsets may be edited from this window, by double clicking on a sensor. The information in this window normally consists of the hardware source of the sensor (Device and Channel number), the depth offset of the sensor from tool zero reference, and the sampling rate.

The information contained in Edit Sensors is defaulted to the current service and current tool string information. For example, sensor depth offsets are derived from the selected tool string and the information contained in the tools database. The default sample rates and device channel assignments are derived from the services file. The default device and channel settings, and the default sample rates are contained in the services.ini file. The default depth offsets are derived from tool information contained in the tools.ini file.

Sensors can not be modified while in a record mode.

It is important to know that no permanent changes are saved from this window. If you change anything in the Edit Tool String window and save them, any changes under Edit Sensors will be deleted when the service is closed. If you have to edit offsets in the Edit Sensor window the Tool.ini file should be modified.

29.2.6 Power Up

Power up the tool string. (Nominally 125V at the STIP)

Adjusting the sync. Start by turning the Panel Control ‘Sync’ slider bar all the way down. Monitor the Waveform Window and slowly raise the Slider Bar. In the Waveform Window you will see the 0/s

changes to typically 3/s or 4/s on the 1 11/16” tool and 7/s or 8/s for the 3 1/8” tool. At this point the waveforms are synced. The PMON Window is used to adjust the telemetry thresholds. (This window will be hidden behind the Waveform window, and must be brought to the front.) On the PMON Window the left arrow adjusts the positive threshold and the right arrow the negative threshold.
Adjusting CSS Telemetry sync. While looking at the PMON window, adjust the positive (+) and negative (-) thresholds to about 50%. Adjust the Panel Control ‘AUX’ Slider to adjust the height of the digital signal, until the pulses are just below saturation

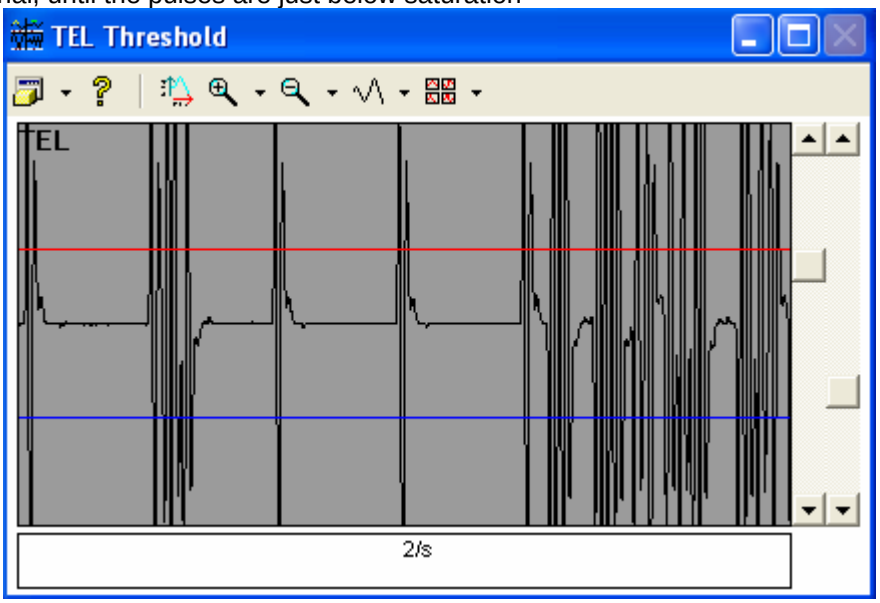


FIG: 29.8 Tel threshold

The PMON discriminator values will be what is saved in the ‘Source/Save Setup’ for this service. *Options - View Axis Scaling* may be used to more accurately set these values. This window is digital. The screen will not update until waveform sync is established. Select *Source/Save Setup* to retain these values for your next log.

29.2.7 Telemetry

Verifying Telemetry Data:
From Warrior Acquisition Window -Select Monitor/ Devices/ DSP:

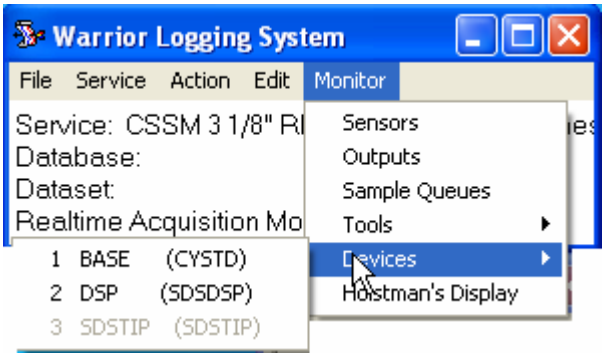
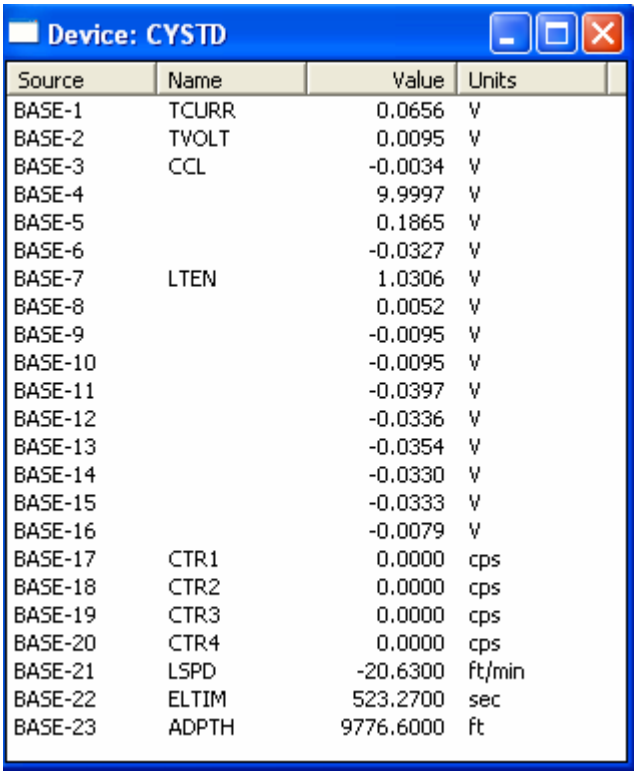


FIG: 29.9 Devices

Values for CSSM 3 1/8” Radial Bond Tool



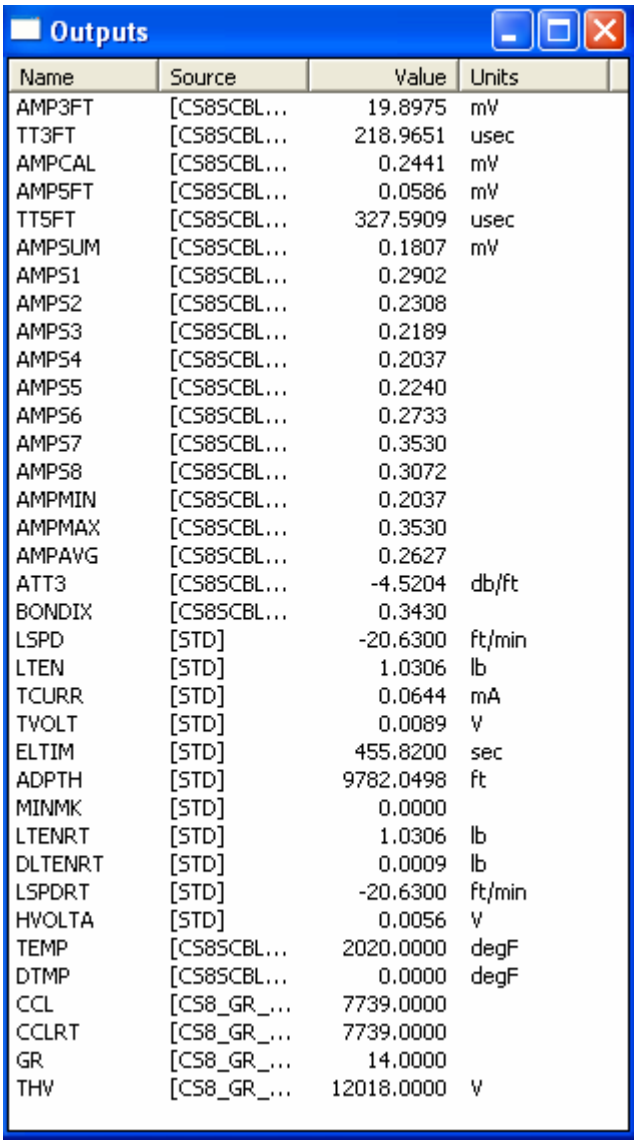
Source	Name	Value	Units
BASE-1	TCURR	0.0656	V
BASE-2	TVOLT	0.0095	V
BASE-3	CCL	-0.0034	V
BASE-4		9.9997	V
BASE-5		0.1865	V
BASE-6		-0.0327	V
BASE-7	LTEN	1.0306	V
BASE-8		0.0052	V
BASE-9		-0.0095	V
BASE-10		-0.0095	V
BASE-11		-0.0397	V
BASE-12		-0.0336	V
BASE-13		-0.0354	V
BASE-14		-0.0330	V
BASE-15		-0.0333	V
BASE-16		-0.0079	V
BASE-17	CTR1	0.0000	cps
BASE-18	CTR2	0.0000	cps
BASE-19	CTR3	0.0000	cps
BASE-20	CTR4	0.0000	cps
BASE-21	LSPD	-20.6300	ft/min
BASE-22	ELTIM	523.2700	sec
BASE-23	ADPTH	9776.6000	ft

FIG: 29.10 Devices List

The above values are very close to what the tool normally reads. Monitor TEL5-CCL, TEL7-Cable head voltage and TEL8-Temperature for stable readings. If necessary adjust the positive threshold in the PMON window up or down to stabilize the readings.

29.2.8 Monitoring Outputs.

From Warrior Acquisition Window select Monitor /Outputs. *An* Outputs window will appear that allows you to monitor signals such as CCL, GR, and other sensors.



Name	Source	Value	Units
AMP3FT	[CS85CBL...	19.8975	mV
TT3FT	[CS85CBL...	218.9651	usec
AMPCAL	[CS85CBL...	0.2441	mV
AMP5FT	[CS85CBL...	0.0586	mV
TT5FT	[CS85CBL...	327.5909	usec
AMPSUM	[CS85CBL...	0.1807	mV
AMPS1	[CS85CBL...	0.2902	
AMPS2	[CS85CBL...	0.2308	
AMPS3	[CS85CBL...	0.2189	
AMPS4	[CS85CBL...	0.2037	
AMPS5	[CS85CBL...	0.2240	
AMPS6	[CS85CBL...	0.2733	
AMPS7	[CS85CBL...	0.3530	
AMPS8	[CS85CBL...	0.3072	
AMPMIN	[CS85CBL...	0.2037	
AMPMAX	[CS85CBL...	0.3530	
AMPAVG	[CS85CBL...	0.2627	
ATT3	[CS85CBL...	-4.5204	db/ft
BONDIX	[CS85CBL...	0.3430	
LSPD	[STD]	-20.6300	ft/min
LTEN	[STD]	1.0306	lb
TCURR	[STD]	0.0644	mA
TVOLT	[STD]	0.0089	V
ELTIM	[STD]	455.8200	sec
ADPTH	[STD]	9782.0498	ft
MINMK	[STD]	0.0000	
LTENRT	[STD]	1.0306	lb
DLTENRT	[STD]	0.0009	lb
LSPDRT	[STD]	-20.6300	ft/min
HVOLTA	[STD]	0.0056	V
TEMP	[CS85CBL...	2020.0000	degF
DTMP	[CS85CBL...	0.0000	degF
CCL	[CS8_GR_...	7739.0000	
CCLRT	[CS8_GR_...	7739.0000	
GR	[CS8_GR_...	14.0000	
THV	[CS8_GR_...	12018.0000	V

FIG: 29.11 Outputs List

Continue to Shop Calibration Section.

29.3 Shop / Tank Calibration:

Make up the tool with the centralizers and slide it into the tank. The tool should show signals on all of the signals in the Waveform Window.

Bring the Waveform Window to the front. The gates appear on the waveforms as a white line on the section of the waveform where they are set.

The gates can be changed on this window by clicking on the waveform that needs to be adjusted (note the dark border around the selected waveform) and then using the buttons in the top right corner of the Waveform Window. To move the gate right or left on the x-axis use the buttons labeled <<< to move it to the left or the button labeled >>> to move the gate to the right. The width of the gate can be increased by selecting the < = > button and decreased by using the > - < button.

Note: It is recommended that you keep all of your gate widths the same. Approximatly 30 micro-seconds works well with most tool types.

Also, specific waveforms can be viewed by selecting Options – Enable, and selecting the waveforms that you want displayed. Reducing the number of waveforms gives you a screen that is easier to work with. Remember to click on the waveform before adjusting the gates.
Before gating on the first arrival use the ('BHC/CBL' pot on the panel for CBL01-09 sytems) (Panel Control 'Sonic' Slider Bar on CBLDR systems) to increase/decrease the signal. Make sure that none of the signals are saturated. (If you are going to be running logs in casing that is smaller than your calibration tank, be aware that the signals will be larger in smaller casings and decrease your signal to accomodate this.)
Note: The signal height on the screen is not valid if you are in threshold mode.
After all of the gates are set select *Source – Save As*. Give this setup a name, such as 'CSSM 1 11/16" Cal Tank Amplitudes.' If there is a problem later the setting can be restored by selecting Source – Load and selcting that setup name.
Note: The same can be done for settings on the PMON Window.

Warning!

AT THIS POINT YOU SHOULD HAVE YOUR GATE (WHITE LINE) ON ALL THE FIRST POSITVE ARRIVALS OF ALL THE SIGNALS BEING DISPLAYED. (The CAL pulse first arrival should be positive. If the first arrival is not positive, the polarity can be changed through Warrior/Utilities/Edit Logging Tool Details.)

On the Waveform Window, select Source – Threshold Mode and use the UP/DOWN Arrows (Only on the 3 ft and 5 ft display). To move the red threshold line to a suitable position where the threshold cuts the first arrival. Make sure it is far enough to avoid baseline noise (This may be above or below the baseline). Threshold Mode is only used to set the travel time thresholds.
On the Waveform Window, select Source – Normal Mode.
On the Acquisition Window select Action – Calibrate – Shop / Free Pipe Zero Cal. A window will appear to sample the base line noise.

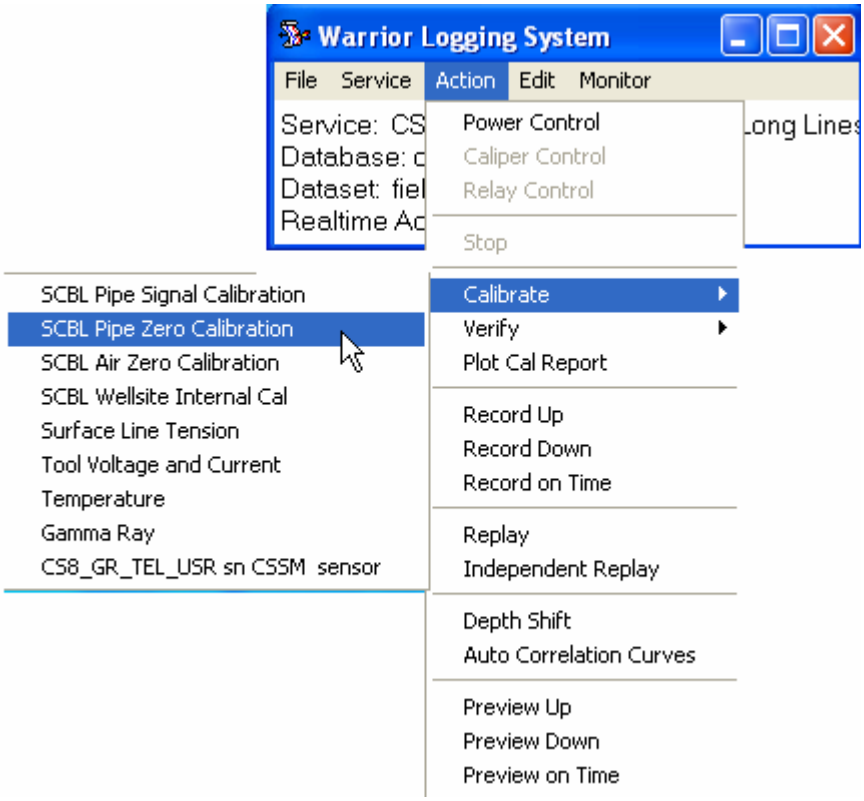


FIG: 29.12 Calibrate

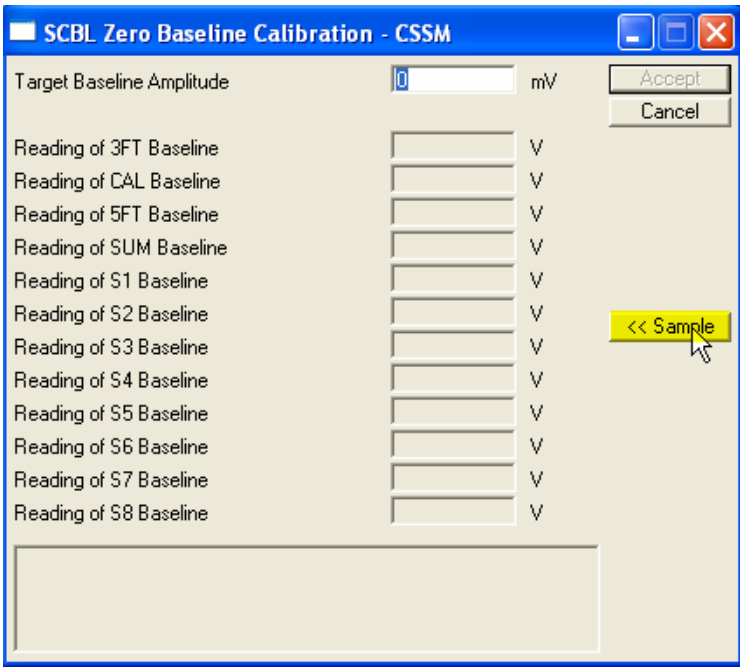


FIG: 29.13 Zero Baseline Calibration

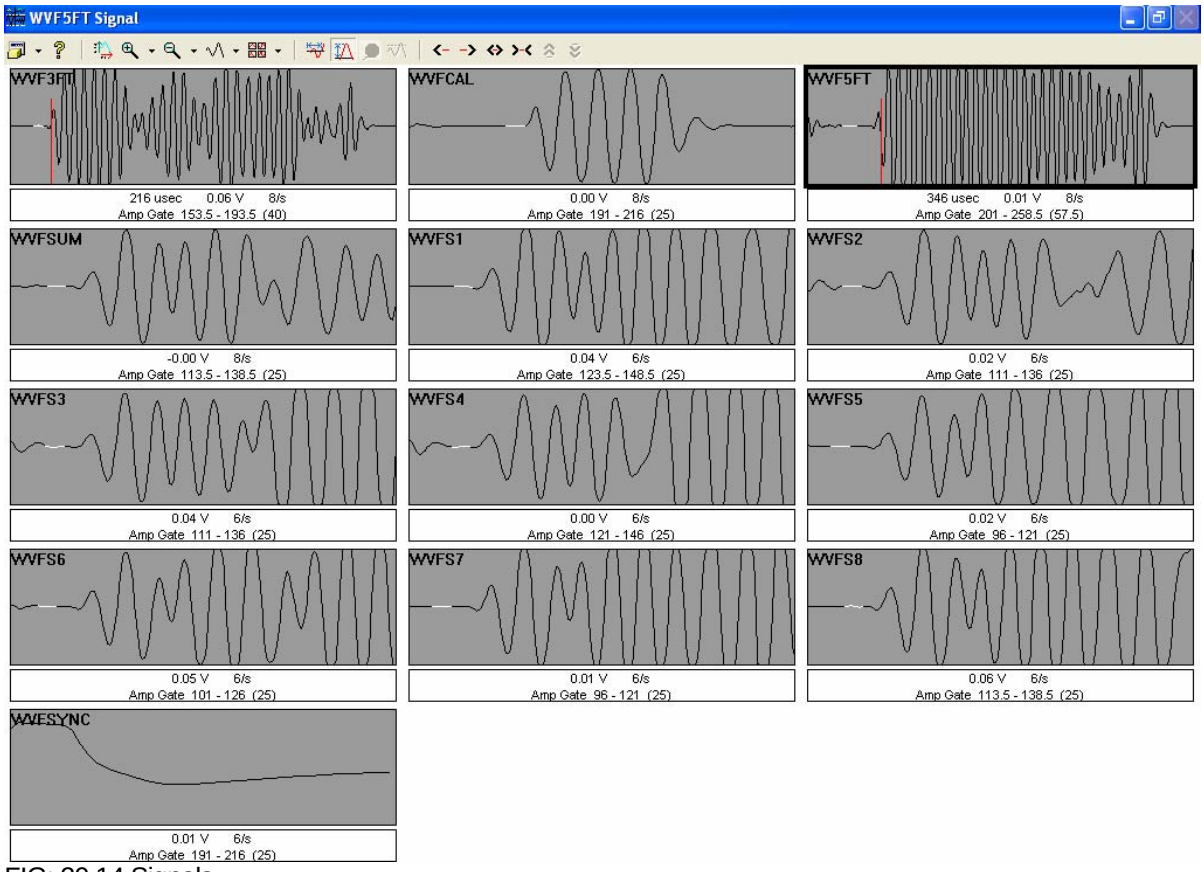


FIG: 29.14 Signals

Make sure the gates for all signals are on the flat part of baseline before the first arrival. These values will be updated when doing the well site air zero cal.
Click on the <<sample button. The Sample & Average Sensor(s) box will appear. Click on the begin button. When the sample is complete, monitor the values they should be very close to zero. If they are click the Accept button. If the values are not close to zero click the Reject button and correct the problem.

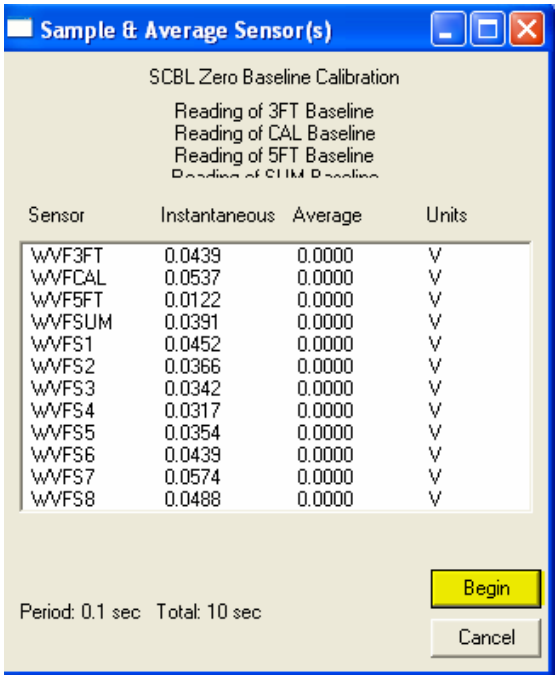


FIG: 29.15 Sensors signals

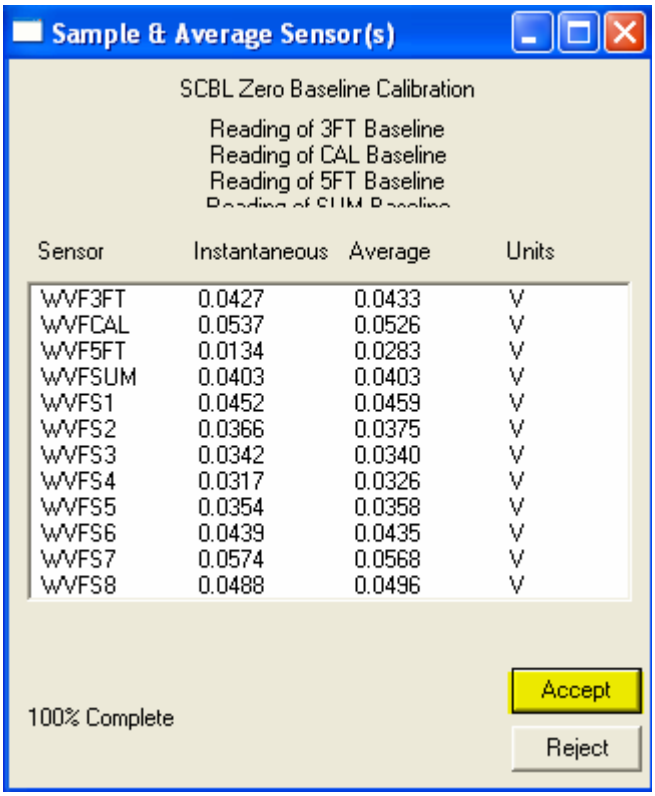


FIG: 29.16 Sensors Value signals

The SCBL Zero Baseline Calibration box will appear check that the values are all close to zero and click Accept.

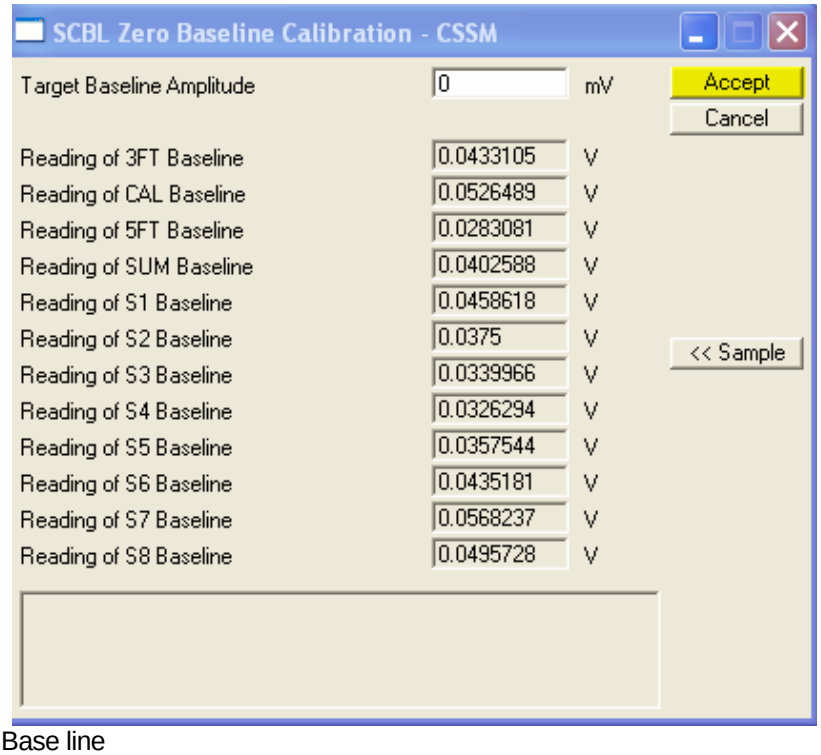


FIG: 29.17 Zero Base line

On the Acquisition Window select Action – Calibrate – Shop/Free Pipe Reference. The SCBL E1 Amplitude Calibration window will appear to sample the first arrival pipe amplitude. The Free Pipe Millvolt of the casing you are sampling is in the cells at the top of the window. The Sector E1 amplitude is normally set to 100 or made to match the 3ft E1 amplitude.

Note: If the value is not there or not correct check to see if the Casing OD and Maximum Amplitude were input in the Variables Window.

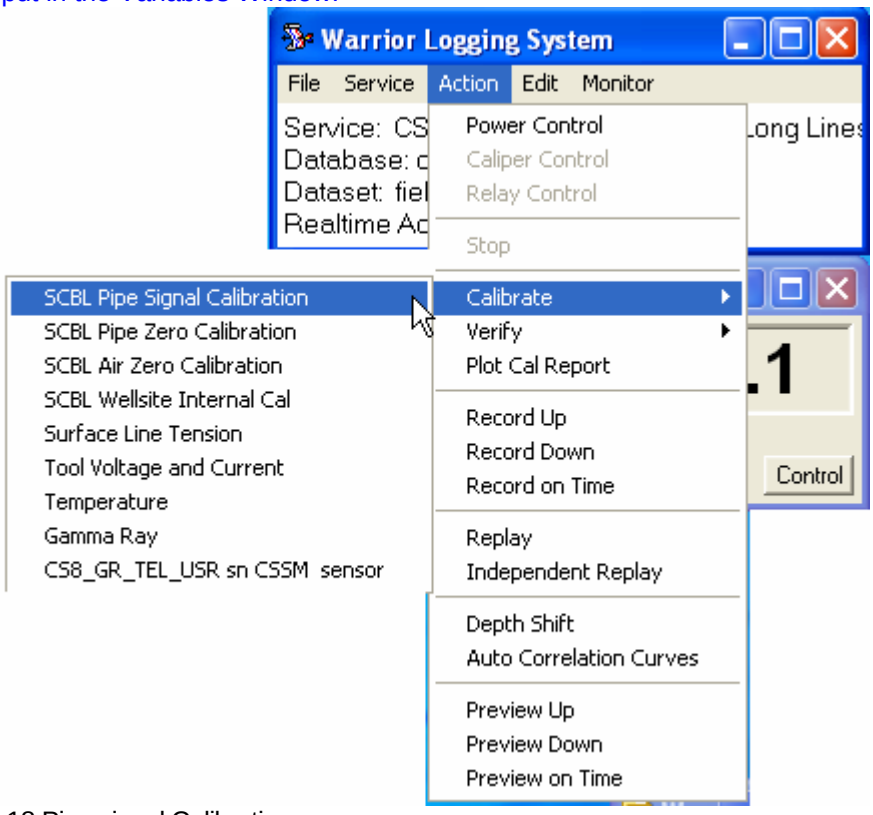


FIG: 29.18 Pipe signal Calibration

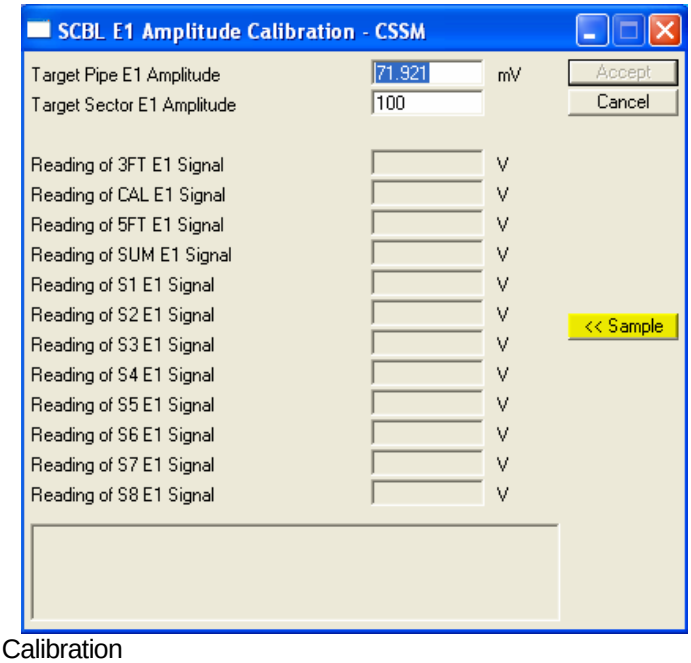


FIG: 29.19 Amplitude Calibration

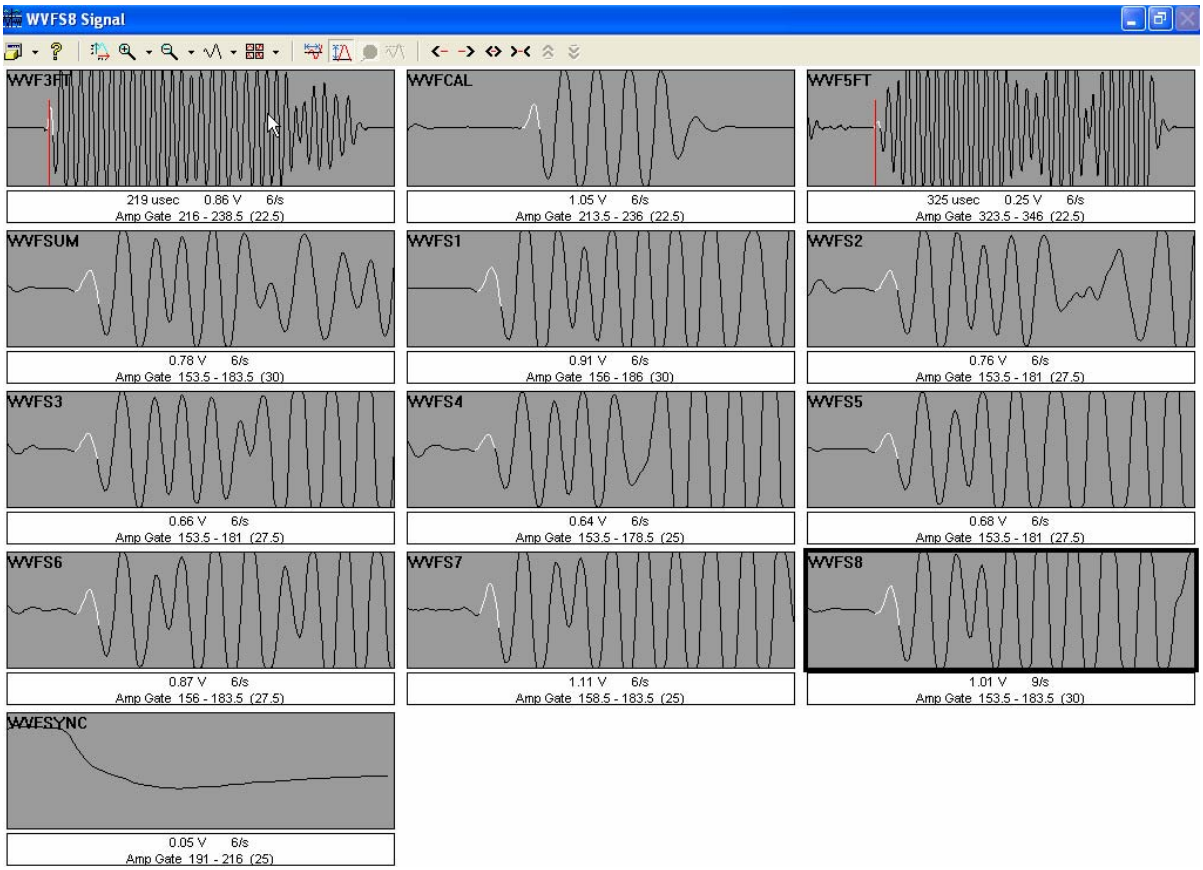


FIG: 29.20 Signals

Make sure the gates for all signals are on the positive part of the first arrival. Click on the <<sample button. The Sample & Average Sensor(s) box will appear.

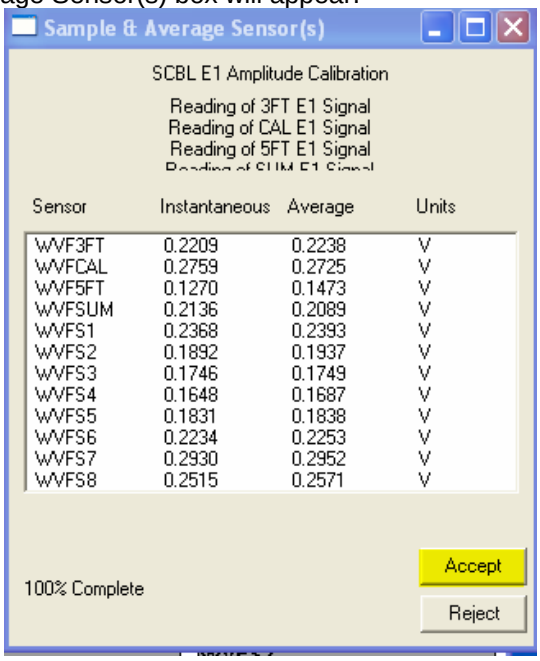


FIG: 29.21 Sample Signals

Select <<Sample. After the sampling has finished select Accept. The calibration gains and offsets for each waveform are displayed. The offsets on all waveforms should be near zero. The gains should range from 20 to150. Select OK.

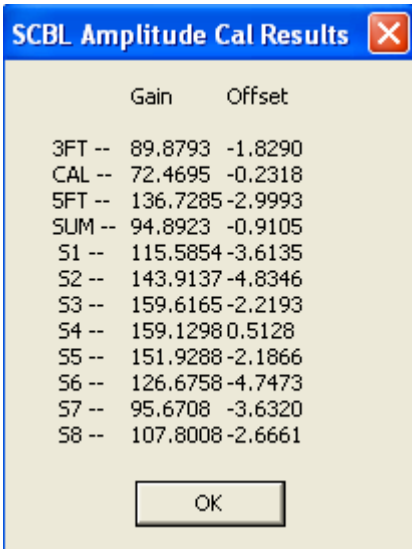


FIG: 29.22 Amplitude Calibration Results

The SCBL E1 Amplitude Calibration window will appear with the raw voltage readings displayed. Select Accept.

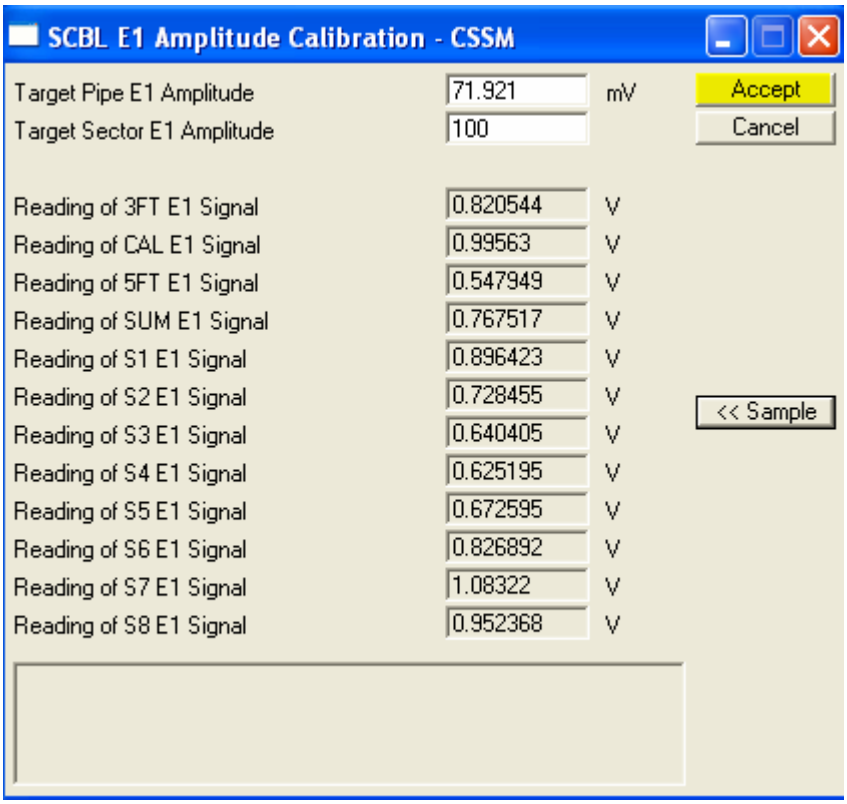


FIG: 29.23 E1 Amplitude Calibration

Note: If you need to make more than one calibration for each tool you must enter a different Serial Number.

Warning! Do not do a downhole cal with the same Serial Number because if you accept the cal and it is no good you will have over written the good shop cal, which can be utilized, if there is no Free Pipe found in the well.

Note: To create In the Warrior Screen select Utilities – Edit Logging Tool details then click Edit Tool. A list will come up, select SCBL and enter the "alias" Serial Number which you will use to do other cals on the same tool without over writing the original. Then Click Create – Tool. Enter a new serial number.

29.4 Wellsite Calibration Procedures:

The GR can be calibrated like any other GR tool. Select Action – Calibrate – Gamma Ray. Follow the onscreen menu.

29.4.1 SCBL Air Zero Cal.

SCBL Air Zero Cal: The following step is performed with the tool hanging in the air. On the Acquisition Window select Action/ Calibrate/SCBL Well Site Air Zero Cal. The SCBL Air Zero Cal window will appear.

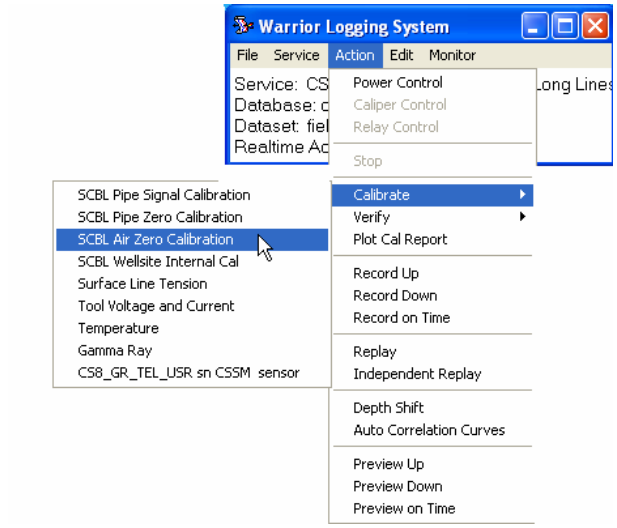


FIG: 29.24 Air Zero calibration

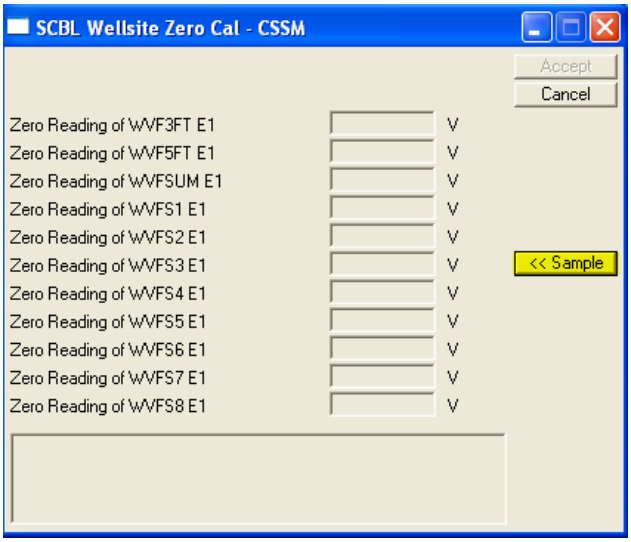


FIG: 29.25 Air Zero calibration

Ensure the gates are set in the proper position for the size pipe to be logged select <<Sample. The Sample & Average Sensor(s) box will appear. Select Begin.

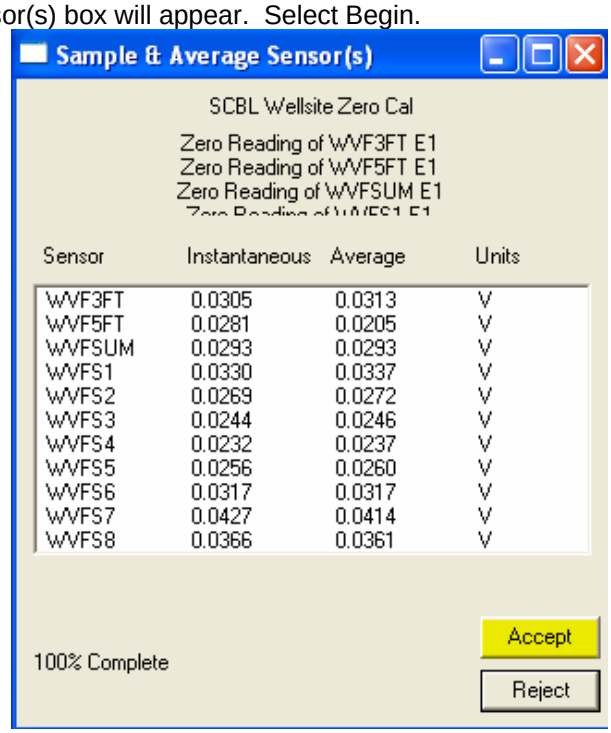


FIG: 29.26 Air Zero Values

All the values should be close to zero, and are used to establish the offset to be applied to the primary gain and offset established in the Shop Calibration. Select Accept.
Select Accept in the SCBL Air Zero Cal Window.

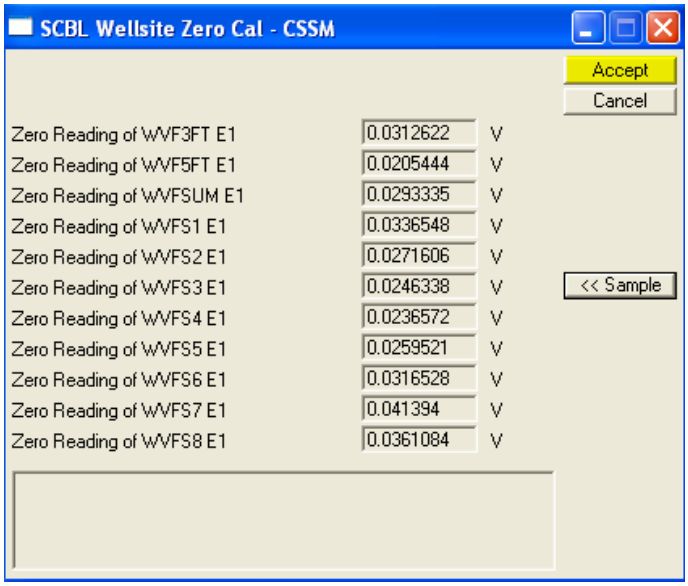


FIG: 29.27 Air Zero reading

29.4.2 SCBL Wellsite Internal Ref Cal

SCBL Wellsite Internal Ref Cal: The following step should be performed down hole. The CAL pulse is recalibrated to compensate for line resistance and temperature. The new values are used to normalize all waveform amplitude values back to the shop calibration.

On the Acquisition Window select Action/ Calibrate/ Well Site Internal Ref Cal. The SCBL Internal Reference Cal window will appear

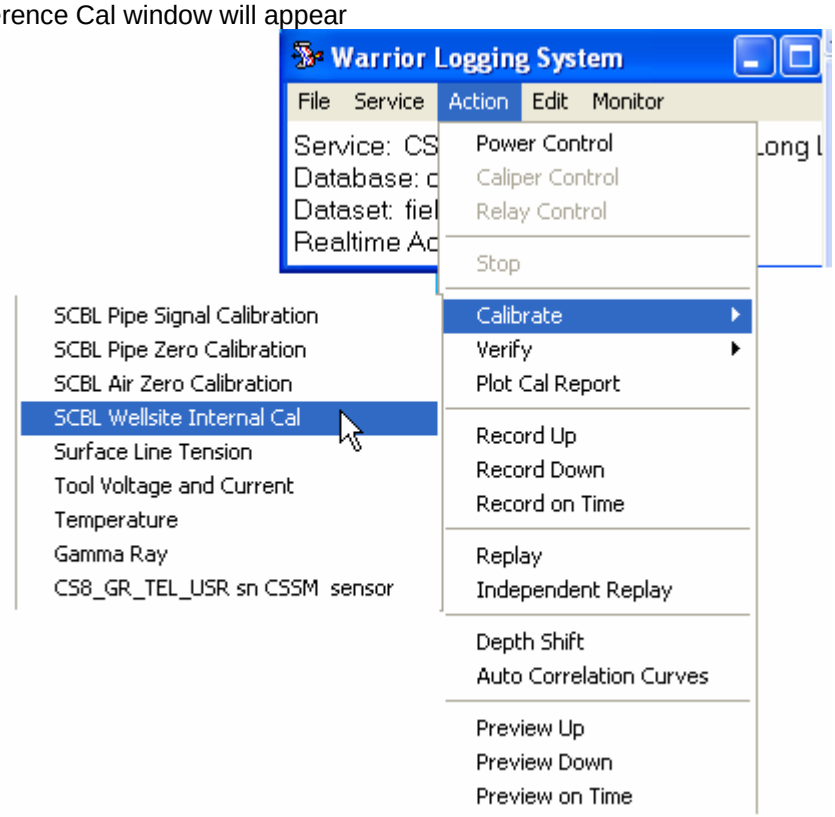


FIG: 29.28 Wellsite Internal Calibration

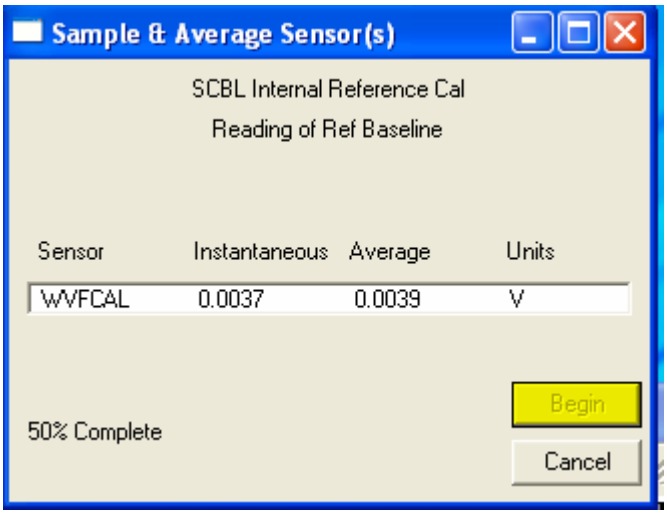


FIG: 29.29 Internal Reference Calibration

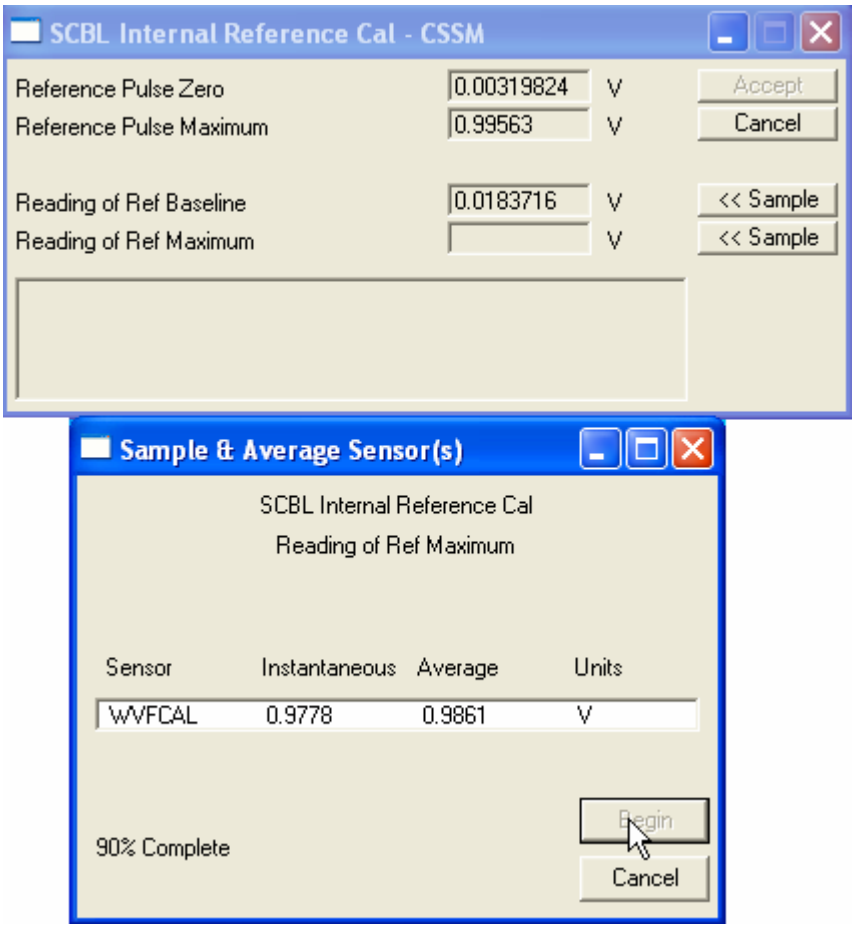


FIG: 29.29 Zero Reference

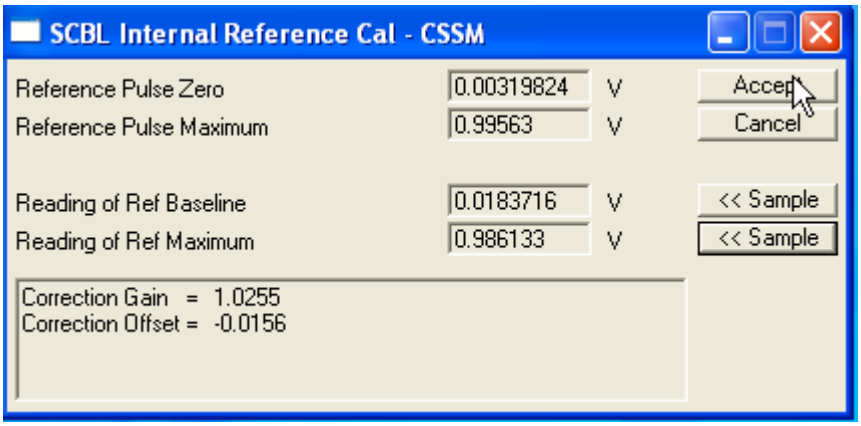


FIG: 29.30 Gain and Offset

Move the gate in the WVFCAL Signal window to the flat part of the baseline in front of the first positive arrival. Select <<Sample on the Reading of Ref Baseline. The Sample & Average Sensor(s) window will appear.

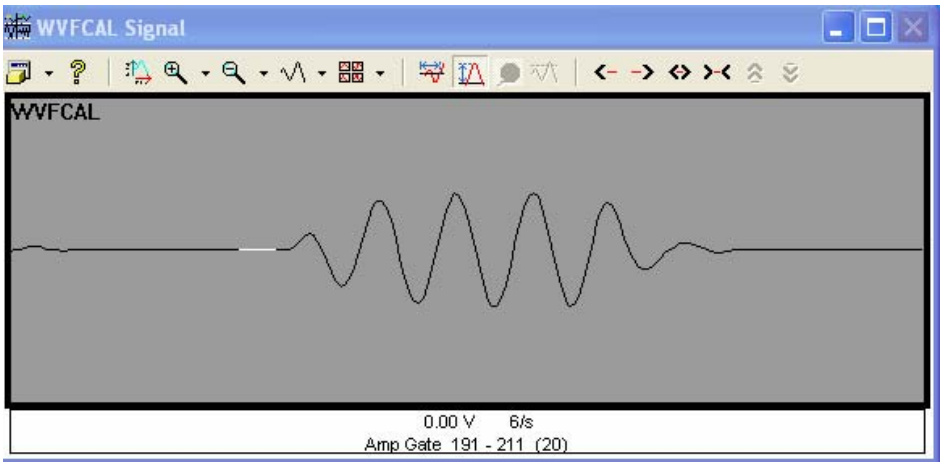


FIG: 29.31 Signal calibration reference

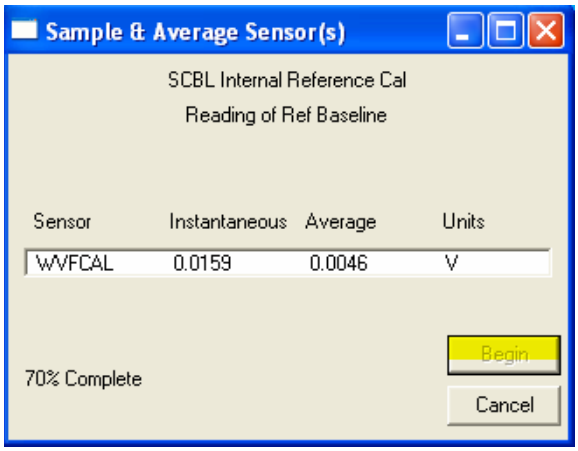


FIG: 29.32 Calibration value

Select Begin the values should be very close to zero. Select Accept.
Move the gate in the WVFCAL Signal window to gate the first positive arrival. Select <<Sample on the Reading of Ref Maximum. The Sample & Average Sensor(s) window will appear.

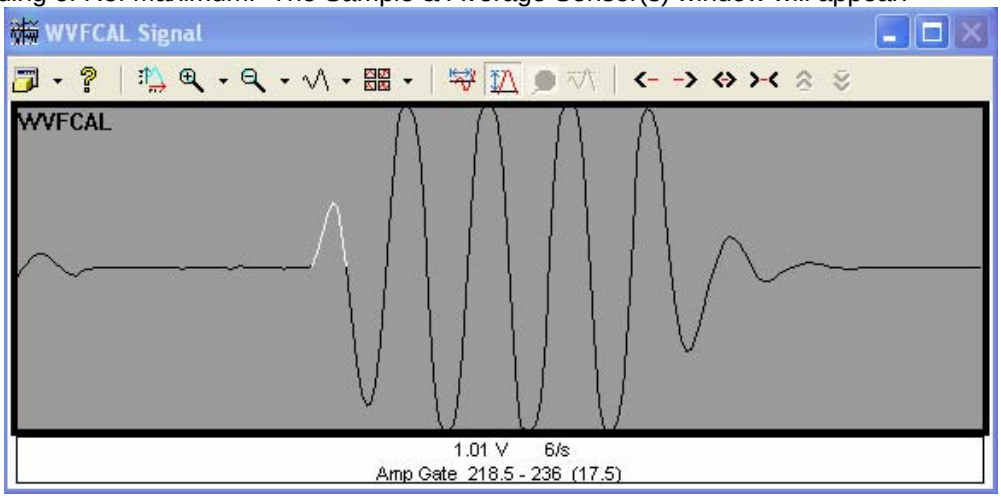


FIG: 29.33 Signal Reference Maximum value

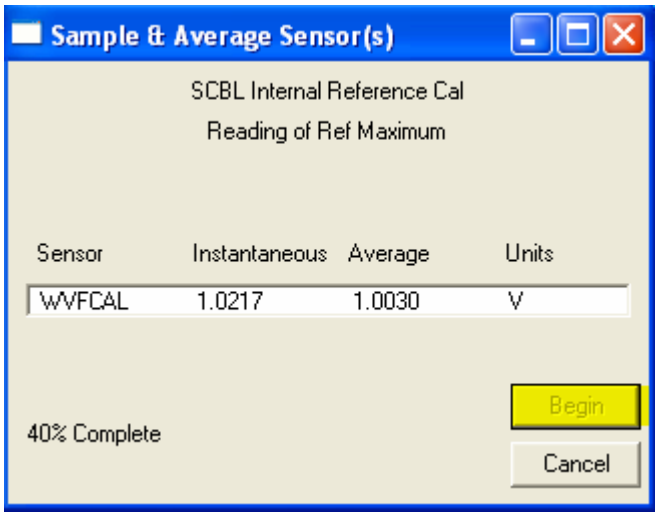


FIG: 29.34 Reference Maximum value

Select <<Begin on the Sample & Average Sensor(s). Select Accept. A gain and offset value will be shown in the SCBL Internal Reference Cal window. The gain should be very close to 1.0 and the offset value will be very close to 0. If they are not, redo your calibrations to ensure that the correct voltage is set for the WVFCAL and the gate was set in the proper position for each reading. Select Accept in the SCBL internal Reference Cal window.

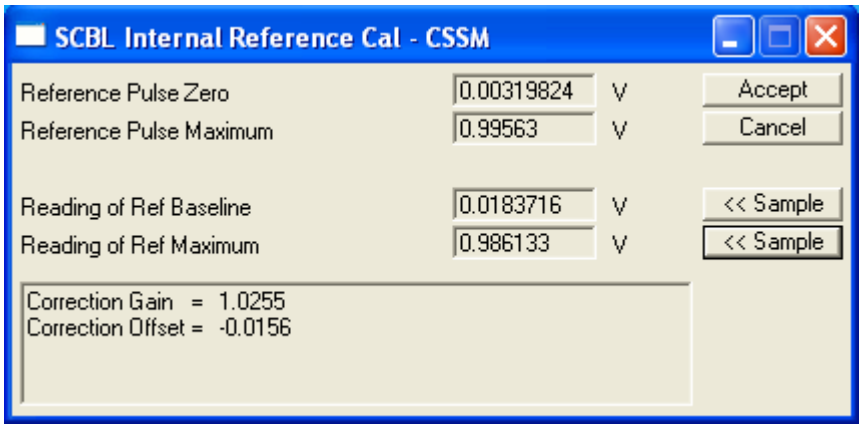


FIG: 29.35 Reference Maximum value

Go in the hole monitoring the various waveforms as shown below. Ensure that the gates are over the first positive signal and that the relative positions of the gates are correct. The gate for the 5ft receiver should be approximately 114 microseconds later in time than the 3ft. The various sector gates should be approximately 57 microseconds earlier in time than the 3ft (for a 2 foot sector spacing).

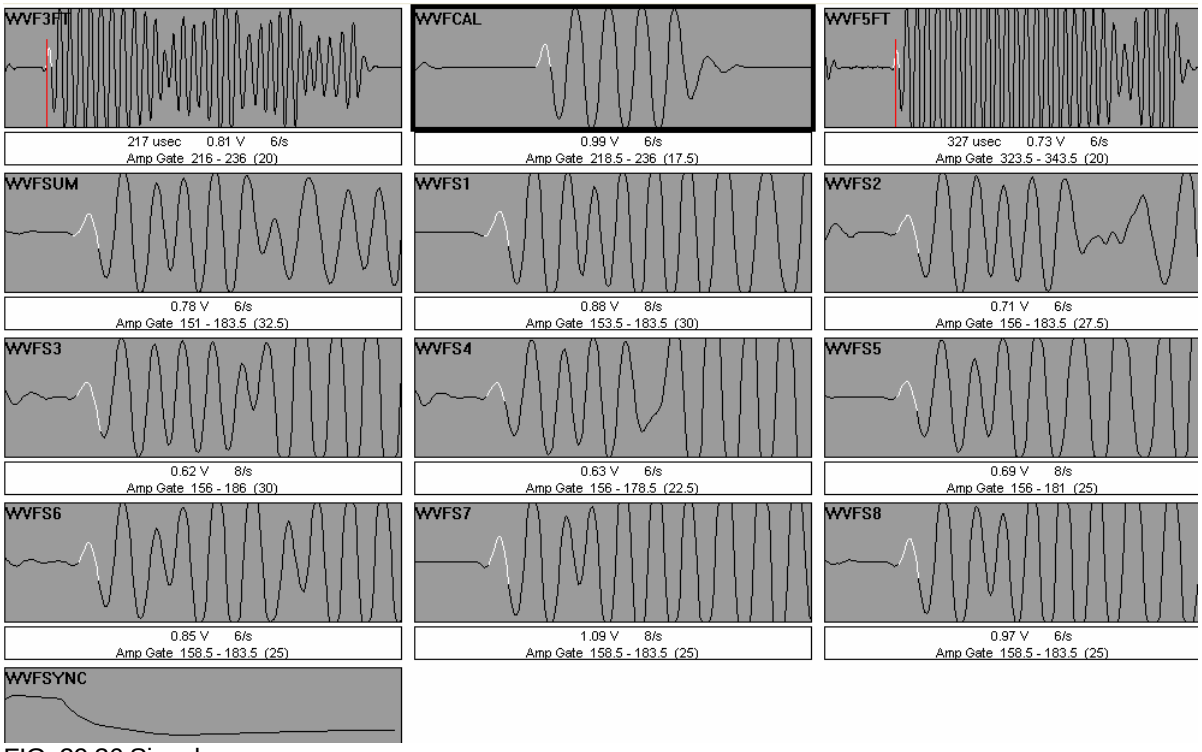


FIG: 29.36 Signals

All waveforms may be shown by selecting Options - Enable from the waveform window.
After the gates are adjusted, open the Monitor -Outputs Window and monitor the various outputs.

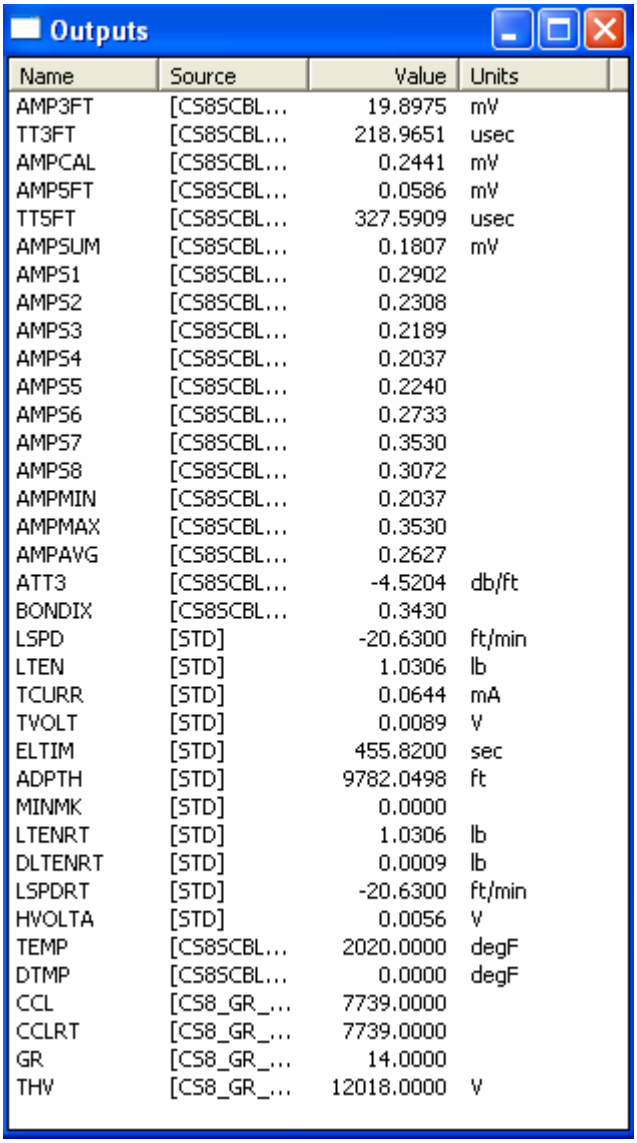


FIG: 29.36 Outputs

The maximum of the 3ft and sector outputs should be approximately those shown in appendix I for a given size casing. The minimum values in bonded casing should also match the indicated values. Sector values will tend to be slightly above indicated values in bonded pipe.

29.4.3 Setting Travel Time:

While monitoring the 3ft Waveform, choose Source - Threshold Setup Mode. Using the right hand scroll bar to set the Threshold Setting. The Travel Time should read within 10 microseconds of the value listed in Appendix I. This threshold should be kept as close to the baseline as possible without the threshold picking up baseline noise and triggering early.

29.5 Running the Log:

1 11/16” CSSM Radial Bond Tool
CCL Calibrations – Gain = 0.1 Offset = -12.8
Temp Calibrations - Gain =1.8 Offset = 32
3 1/8” CSSM Radial Bond Tool
CCL Calibrations – Gain = 0.0005 Offset = -3.7
Temp Calibrations - Gain =0.02 Offset = 0
An example Radial Bond presentation is shown below.

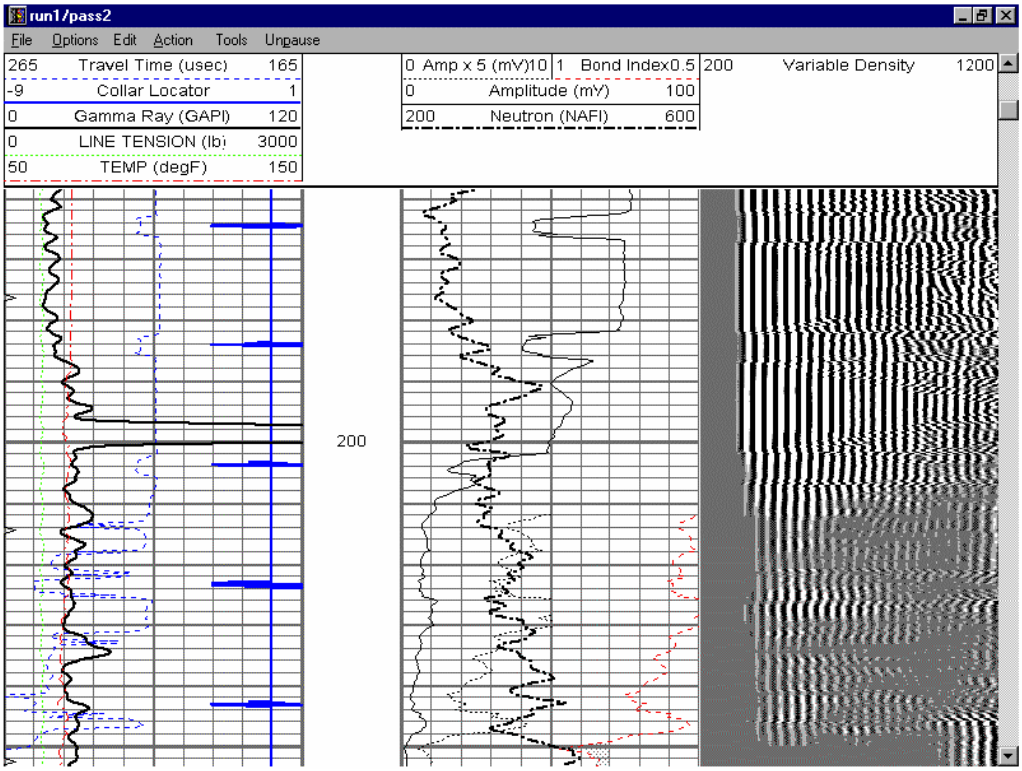


FIG: 29.37 Log

The additional Radial Bond presentation is shown below. This presentation shows the eight sector readings and the waveforms of each as a signature presentation.

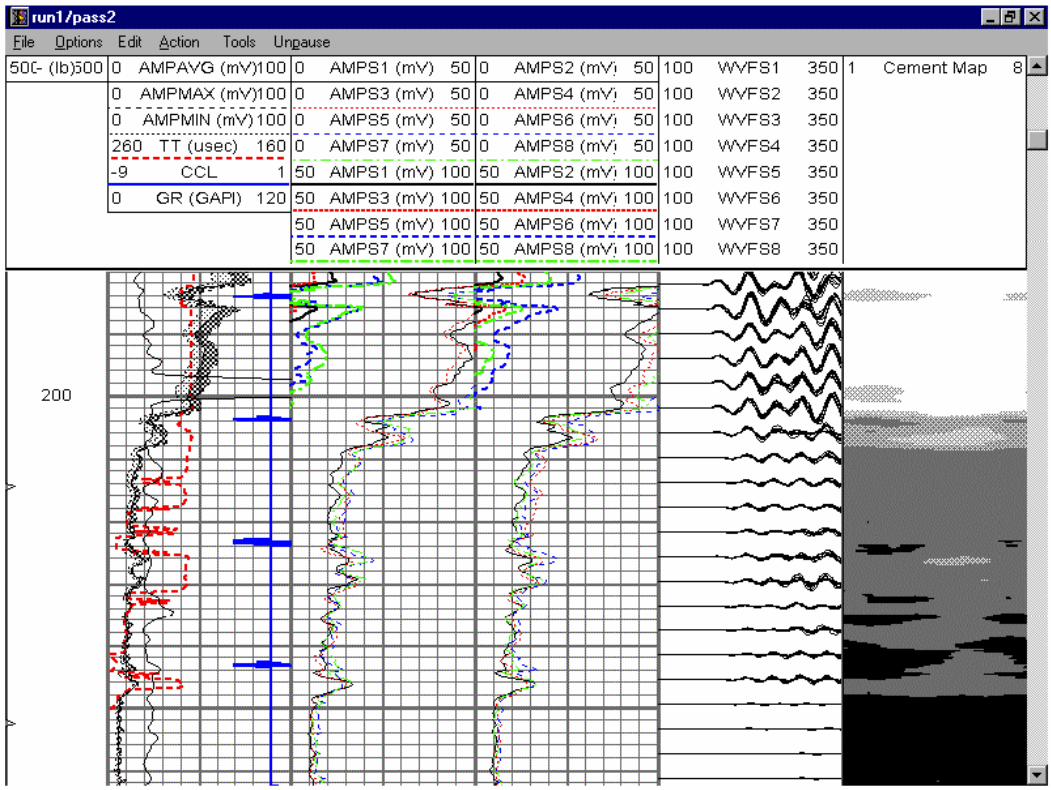


FIG: 29.37 Log Additional Radial Bond Presentation with Cement Map

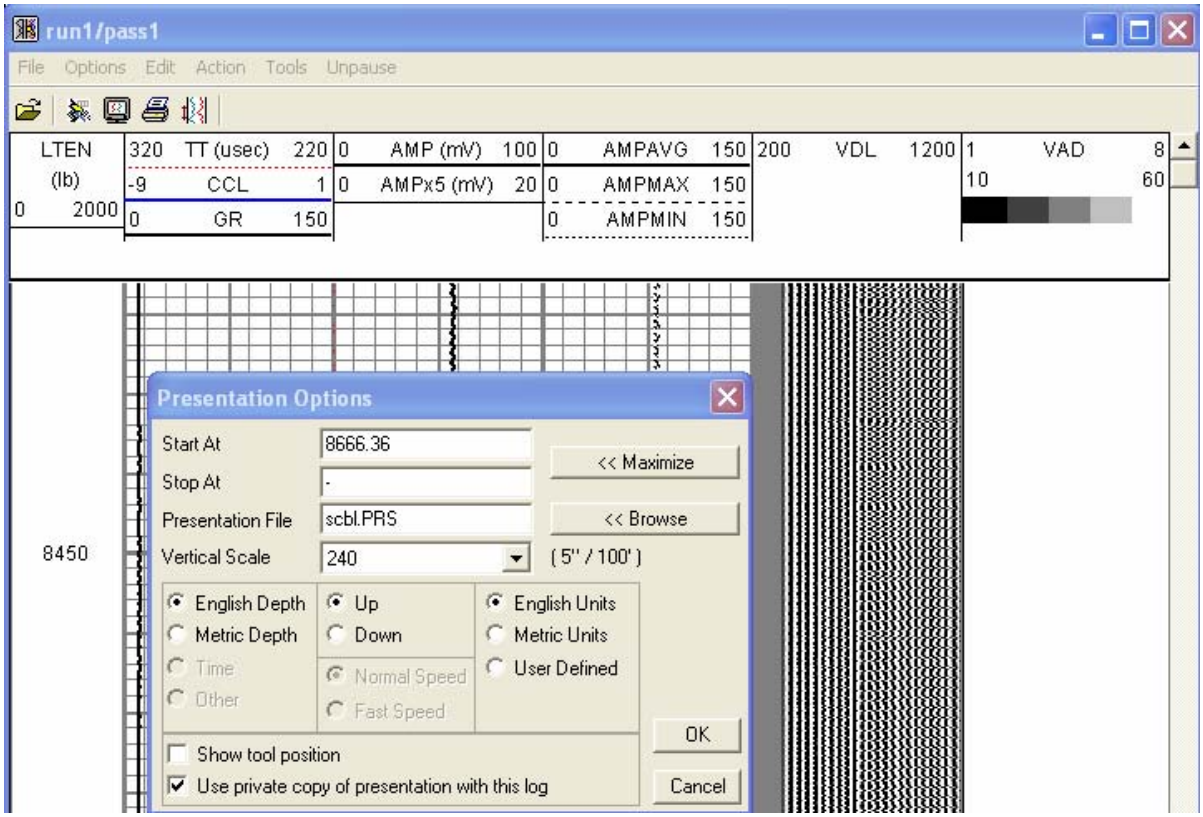


FIG: 29.38 Presentation Options

The Presentation may be changed by clicking on *Options* in the Interactive Plot Window. This brings up the window shown below. Either browse to select the presentation required, or edit the presentation name to the desired presentation.
Under Plot Job Editor, calling up Single Log pass will bring up a similar window. Editing the Format field will allow you to show the same pass, using different presentations.
Note: This same window allows you to show the same pass with different logging scales.
Note: Annotations must be made from the Interactive Replay Window for each presentation, as the annotations will not be transferred from one presentation to another.

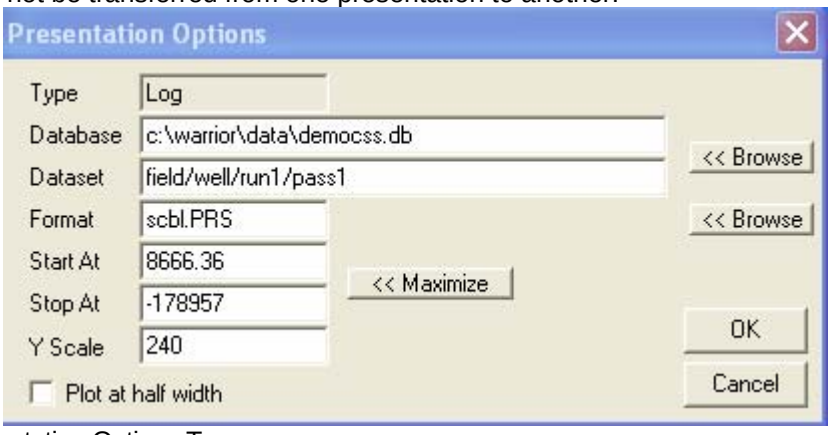


FIG: 29.38 Presentation Options Type

APPENDIX A

PIPE			1 11/16" RCBS			3 1/8" RCBL		
OD	WEIGHT	ID	RADIAL	3 FT	5 FT	RADIAL	3 FT	5 FT
2.875	6.500	2.441	128	204	318			
	7.900	2.323	126	202	316			
	8.700	2.259	125	201	315			
	9.500	2.195	123	199	313			
	10.700	2.091	121	197	311			
	11.000	2.065	121	197	311			
3.500	9.300	2.992	139	215	329			
	10.300	2.922	138	214	328			
	12.800	2.764	135	211	325			
	12.950	2.750	134	210	324			
	15.800	2.548	130	206	320			
	16.700	2.480	129	205	319			
4.000	11.850	3.476	149	225	339			
	14.000	3.340	146	222	336			
4.500	9.500	4.090	161	237	351	151	208	322
	10.500	4.052	160	236	350	150	207	321
	11.600	4.000	159	235	349	149	206	320
	13.500	3.920	157	233	347	148	205	319
	15.100	3.826	155	231	345	146	203	317
5.000	11.500	4.560	170	246	360	160	217	331
	13.000	4.494	169	245	359	159	216	330
	15.000	4.408	167	243	357	157	214	328
	18.000	4.276	164	240	354	155	212	326
	20.300	4.184	162	238	352	153	210	324
	23.200	4.044	160	236	350	150	207	321
	24.200	4.000	159	235	349	149	206	320
5.500	13.000	5.044	179	255	369	170	227	341
	14.000	5.012	179	255	369	169	226	340
	15.500	4.950	177	253	367	168	225	339
	17.000	4.892	176	252	366	167	224	338
	20.000	4.778	174	250	364	165	222	336
	23.000	4.670	172	248	362	163	220	334
	26.000	4.548	170	246	360	160	217	331

6.000	15.000	5.524	189	265	379	179	236	350
	18.000	5.424	187	263	377	177	234	348
	20.000	5.352	185	261	375	176	233	347
	23.000	5.240	183	259	373	174	231	345
	26.000	5.132	181	257	371	172	229	343
6.625	17.000	6.135	201	277	391	191	248	362
	20.000	6.047	199	275	389	190	247	361
	24.000	5.921	197	273	387	187	244	358
	28.000	5.791	194	270	384	185	242	356
	32.000	5.675	192	268	382	182	239	353
7.000	17.000	6.538	209	285	399	199	256	370
	20.000	6.456	207	283	397	198	255	369
	23.000	6.366	205	281	395	196	253	367
	26.000	6.276	203	279	393	194	251	365
	29.000	6.184	202	278	392	192	249	363
	32.000	6.094	200	276	390	190	247	361
	35.000	6.004	198	274	388	189	246	360
	38.000	5.920	196	272	386	187	244	358
7.625	20.000	7.125				211	268	382
	24.000	7.025				209	266	380
	26.400	6.969				208	265	379
	29.700	6.875				206	263	377
	33.700	6.765				204	261	375
	39.000	6.625				201	258	372
	45.300	6.435				197	254	368
8.625	24.000	8.097				230	287	401
	28.000	8.017				228	285	399
	32.000	7.921				226	283	397
	36.000	7.825				224	281	395
	40.000	7.725				222	279	393
	44.000	7.625				220	277	391
	49.000	7.511				218	275	389
9.625	29.300	9.063				249	306	420
	32.300	9.001				247	304	418
	36.000	8.921				246	303	417
	40.000	8.835				244	301	415
	43.500	8.755				243	300	414
	47.000	8.681				241	298	412
	53.500	8.535				238	295	409
	58.400	8.435				236	293	407
	61.100	8.375				235	292	406
	71.800	8.125				230	287	401

APPENDIX B

29.6 Map

29.6.1 Introduction

The heart of the Radial Bond Tool is the segmented crystal found below the transmitter. This crystal is cylindrical in shape. It is divided into 6 or 8 segments, each of which covers a section of the well bore.

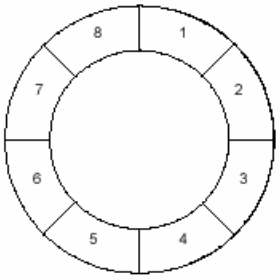


FIG: 29.39 Sector Map

29.6.2 The Calibration Procedure

When the Radial Bond Tool is calibrated, the sonde section is rigidly centralized in a 5-1/2" calibration chamber and the chamber is pressured up to 500 lbs of water pressure. The tool is powered up and the calibration signal is set to a reference voltage, using pots within the electronics section of the tool. Gates are then set over E1 of the 3ft, 5ft, and each of the segmented crystals. Each of these signals is then set to 1 Volt, again using pots within the electronics section.

Using the SCBL Shop/Free Pipe Calibration routine, the tool is then calibrated so that each of the signals reads 100 millivolts within the test chamber. Then, the test chamber is depressurized, and the tool is rotated 180 degrees. The test chamber is again pressurized and the calibrations are checked again to assure that the tool was properly centralized during the calibration procedure.

NOTE: While it is true that the expected amplitude reading for the 3ft receiver in 5-1/2" casing is 72 millivolts, that is the expected reading with pressurized water on the backside of the casing. The presence of air on the backside allows the test chamber to vibrate more freely than 5-1/2" casing. The expected readings of the 3ft in various sizes of pipe, are based upon a tool calibrated to 100 millivolts in a 5-1/2" test chamber with air on the backside.

29.6.3 The Radial Readings

Edit Calibrations

Edit Select

Name	Type	Gain	Hi Read	Hi Ref	Lo Read	Lo Ref	Offset
AMP3FT	Lin2Pt	97.649	1.009	100.000	-0.015	0.000	3.004
WS_3FT	Lin2Pt	1.008	0.000	0.000	0.005	0.000	-0.021
AMPCAL	Lin2Pt	66.102	1.503	100.000	-0.009	0.000	0.625
WS_CAL	Lin2Pt	1.008	1.493	1.503	-0.008	-0.009	-0.001
AMP5FT	Lin2Pt	98.521	1.000	100.000	-0.015	0.000	1.491
WS_5FT	Lin2Pt	1.008	0.000	0.000	-0.006	0.000	-0.009
AMPSUM	Lin2Pt	99.273	0.993	100.000	-0.014	0.000	1.403
WS_SUM	Lin2Pt	1.008	0.000	0.000	-0.008	0.000	-0.006
AMPS1	Lin2Pt	97.452	1.011	100.000	-0.015	0.000	1.482
WS_S1	Lin2Pt	1.008	0.000	0.000	-0.008	0.000	-0.007
AMPS2	Lin2Pt	98.770	0.997	100.000	-0.015	0.000	1.505
WS_S2	Lin2Pt	1.008	0.000	0.000	-0.006	0.000	-0.009
AMPS3	Lin2Pt	98.485	1.002	100.000	-0.014	0.000	1.366
WS_S3	Lin2Pt	1.008	0.000	0.000	-0.008	0.000	-0.006
AMPS4	Lin2Pt	97.953	1.008	100.000	-0.013	0.000	1.296
WS_S4	Lin2Pt	1.008	0.000	0.000	-0.007	0.000	-0.006
AMPS5	Lin2Pt	97.091	1.016	100.000	-0.014	0.000	1.337
WS_S5	Lin2Pt	1.008	0.000	0.000	-0.003	0.000	-0.011
AMPS6	Lin2Pt	98.266	1.004	100.000	-0.014	0.000	1.346
WS_S6	Lin2Pt	1.008	0.000	0.000	-0.008	0.000	-0.006
AMPS7	Lin2Pt	99.237	0.994	100.000	-0.013	0.000	1.325
WS_S7	Lin2Pt	1.008	0.000	0.000	-0.008	0.000	-0.006
AMPS8	Lin2Pt	99.230	0.995	100.000	-0.013	0.000	1.308
WS_S8	Lin2Pt	1.008	0.000	0.000	-0.007	0.000	-0.006

FIG: 29.40 Radial Readings

With the Shop Calibration recorded in the Tools.ini file, all that is left for the Engineer to do at the well site, is to perform the SCBL Wellsite Internal Reference Cal and the SCBL Air Zero Cal. These calibrations generate a secondary Gain and Offset that are applied to readings from the SCBL outputs before they are plotted and recorded. These secondary calibrations are identified by WS_ and are listed directly under the curve to which they are applied.
When the SCBL Internal Reference Calibration is performed, the High and Lo Read of the AMPCAL from the Shop Calibration are used as the Hi and Lo Ref for the WS_CAL and the Calibration Signal is calibrated back to the readings taken during the Shop Calibration. The Gain derived from this calibration is then applied to ALL of the Bond curves. This calibration adjusts the Warrior Logging System for differences in line length and variations in CBL/BHC Signal gains.
When the SCBL Air Zero Cal is performed, the gates of all the bond signals are set to their approximate values for the casing size anticipated by choosing the appropriate Setup (under *Load Setup*), while to tool is in air. This calibration generates the secondary calibration offset, which is applied to each of the Bond curves individually.
When using Shop Calibrations for logging, both of these calibrations must be done before going in the hole. If, for some reason a Wellsite Calibration is performed, there is no need to perform these two additional calibrations. Wellsite calibrations are not recommended except under unusual situations.

29.6.4 The Cement Map

The Cement Map is a graphical representation of the response of the sector measurements. The shading of the cement map is purely representative of the recorded amplitude readings from the various sectors. Look back to the representation of the segmented crystal shown at the beginning of this bulletin, and visualize the sectors laid out horizontally.

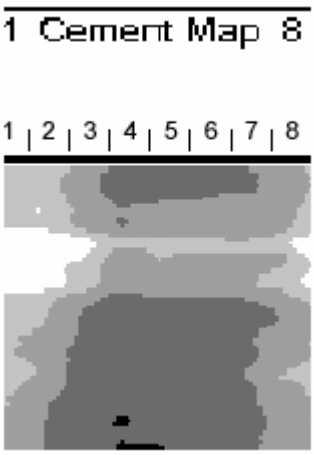


FIG: 29.41 Cement Map

Each of the individual sectors is represented by a section of the cement map, as shown below. The shade applied to each section of the map is a function of the amplitude of that sector as recorded.
The Warrior Logging System uses an algorithm to determine the shading associated with the amplitude recorded, based on several factors. These factors include:
The number of grayscales and the density of the grayscales in the Cement Map, as applied in the screen and printer setup within the Warrior.ini file.
The Filter level associated with each of the Sector Curves.
The amplitude reading of adjacent sectors.
The High Reference recorded in the Shop Calibration associated with each Sector Curve.
The Black and White values set in the presentation file.

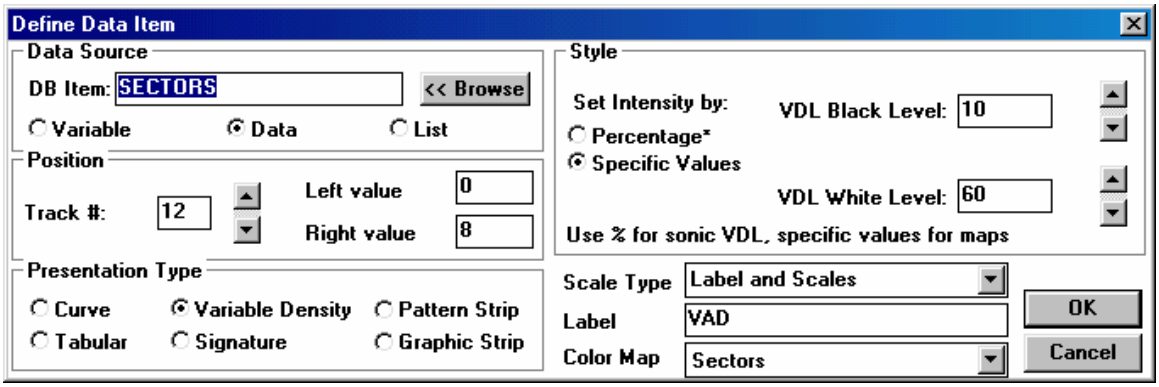


FIG: 29.42 Sectors

The only factor under control of the engineer is the Black and White values within the presentation file. The purpose of the Cement Map is to graphically illustrate small channels that may pose a problem. With that end in mind, the following is the proscribed setup for the Cement Map.
With the Black and White Levels set as above, the grays scales of the Cement Map will change as follows:

1. Amplitudes less than 10mv Black
2. Amplitudes greater than 10.0mv and less than 26.7mv Dark Gray
3. Amplitudes greater than 26.7mv and less than 43.3mv Medium Gray
4. Amplitudes greater than 43.3mv and less than 60.0mv Light Gray
5. Amplitudes greater than 60.0mv White

If different gray scales are needed for a particular application, contact Technical Support.

29.6.5 Logging Conditions

The Cement Map is a visual representation of the cement conditions behind the pipe. The Sector Crystal is not free to rotate within the tool, and the cement and casing are not free to rotate. However, the tool itself is free to rotate with the well, and it is expected that it will. For this reason, apparent “channels” may rotate within the cement map while running repeats, and that the Cement Map may not repeat exactly.
The Cement Map also becomes an important aid to quickly identify problems in tool setup or logging procedures.

Section

30

30 Ultrawire Memlog Chart

30.1 Updating Warrior V7.00

Run the self extracting Warrior Updates executable.
Add the following entry to Warrior.ini (found in the Warrior Config directory, or use the shortcut in Sondex Utilities).
In the Device Alias section add UWD=UWMEMORY
[Device Alias]
UWD=UWMEMORY
Next import the new UW memory tools using the Warrior tool editor (found in Utilities).
In the Calibration select Restore and select MBH025.wcf, UMT003.wcf, MITUW.wcf, PRC034.wcf, PRC057.wcf in turn. This imports the Memory Battery Holder, Ultrawire memory tool, Ultrawire MIT and 2 new centralizers.
Now add the new Ultrawire memory services. In the Service Editor (Utilities) import UMT Services.wsv which contains all 4 memory services.

30.2 Update MCU driver

Uninstall the current MCU device driver (using the Device Manager) and reinstall the latest MCU driver (SXMCULDR.SYS). The version required is V1,0,0,6 or greater.

30.3 Update UMT firmware

Open Ultrawire Memlog, select the Diagnostic menu and click on Upload new firmware. Select the latest firmware file (XXXX.bin) and as long as the UMT is connected to the MCU the new firmware is uploaded.

30.4 Using Ultrawire Memlog

Setting up the Service (tool string).
All service information is set up in Warrior. In Warrior Acquisition select the required Memory Service (i.e. Ultrawire Memory MIT). Make up the tool string, and at this point it is possible to perform all the calibrations using an XTU.
Next, if required set up the zoned variables in Warrior.
Once the service information is complete then UW Memlog can be used.

LEAVE WARRIOR RUNNING, DO NOT CLOSE UNTIL YOU HAVE FINISHED USING UW MEMLOG!

30.4.1 Open UW Memlog

The first thing that must be done is to set up the DPT Settings. In the Edit menu select Edit DPT Settings, the options in this window must match those on the DTR or UW Memlog will not output the correct depth units!

Create a new project (File menu, or toolbar), the user is then prompted to create the project files. Only do this if the service has been completely set up in Warrior.

UW Memlog takes all the service information from Warrior (toolstring, telemetry information etc) and creates the Project.ini and the Service.ini in the project directory. It also copies any calibration files in Warrior to the Project directory. They are not used by UW Memlog, but are a useful archive.

Next import the zoned variables from Warrior. In the UW Memlog File menu select Create Variables database. This takes the zoned variable information and places it in the Project directory (vars.db).

30.4.2 Create the Profile

The profile editor is slightly modified from the previous version of Memlog. Is it now possible to sample any tool, at any rate (within reason). For each profile line a tool can be sampled at a different rate.

The first difference is that a start time for the profile line is NOT entered; this has been changed to the length of the profile in seconds.

The second major change is the profile type. There are 4 options, LOG, OPEN, CLOSE and SLEEP.

LOG is the default and will record all the tools at the selected sample rates.

OPEN and CLOSE can only be used on tools with motorized arms. (i.e. MIT). It is recommended that each OPEN and CLOSE profile be 3 minutes in length to allow the tool to fully open and close.

Note when an OPEN or CLOSE profile type is selected the tool to be opened\closed must also be selected in the rate window. The drop down list will now contain OPEN or CLOSE rather than sample rates.

NOTE: Only one tool can be opened or closed in a single profile!

NOTE: During an open or close no other tools can be sampled.

I recommend that a LOG profile precedes each open or close profile type.

The amount of memory being used can be seen at the bottom of the window. Make sure this does NOT exceed your memory limit.

If an MIT is in the service there will be two memory usage values. Click on the Details… button and select the MIT compression rate to view the true memory used.

Save the profile.

30.4.3 Programming the tool

Assemble the toolstring and attach to the MCU etc.

If an MIT is in the toolstring, then before programming the tool, the COMPRESSION MODE must be set.

Enter Command mode in UW Memlog (toolbar option), once the Command window is loaded, using Warrior select the MIT Tool Configuration window and select the Sample Options button.

The following options should selected and sent to the MIT.

Compression Mode = Absolute (12 bit), although this is a user choice.

Sample Type= On Demand

Sample Rate = 20 or 50 ms (again a user choice).

Send the command to the MIT, if the command is sent successfully the Command window will increment the command and response counters.

NOTE: If testing in the shop it might be worth changing the Memory size to 2MB prior to programming the tool (Edit menu). This will save time, but REMEMBER TO CORRECT IT BEFORE GOING ON A JOB.

Program the tool using the toolbar option.

Monitoring the tool, or run the job

To monitor the tool select the Monitor toolbar option (Warrior MUST be open with the correct service). The Monitor window outputs the MCU voltage, but the tool readings are sent directly to Warrior and can be view in Warrior in the View Outputs window.

As UW Memlog is transmitting the data directly to Warrior, the calibrations can be preformed if required. Use the standard Warrior calibration routines.
Remember if you perform a new calibration it is recommended that you recreate the UW Memlog project files.

30.4.4 Download the tool

Download the tool using the toolbar option. It is recommended that all the errors are viewed and the user look at the UWstats text file. It will report any errors on each of the UW addresses and is a useful diagnostic tool.

30.4.5 Visual Merge the depth and tool data

Note: I have not gone into the DTR download and setup as this is identical to the old Memlog.
Visual Merge is also pretty much the same as the previous version, although UW Memlog only uses raw memory data, so the plotted data is all raw values.
The depth and tool data should be tied-in as usual and all passes picked and saved to file.

30.4.6 Output passes

UW Memlog now only outputs directly to Warrior. Select the passes to output to Warrior, and select the options for time based outputs (i.e. fast or slow sampling).
Output the passes, you are prompted for a Warrior database name. Make sure you do not attempt to over write a previously created database. You can append to an existing database but the pass names must be different.

30.4.7 Recalculating the raw UW Memlog data and creating the curves

UW Memlog outputs a raw data dump into the Warrior database. To extract the curves and apply the calibrations Warrior Recalculation must be used.
Open Warrior Recalculation and select the database you have just output from UW Memlog. Enter a name for the recalculated pass and select OK.
At this point, if an MIT or CAT is in the tool string the user is prompted to use either current or embedded calibration files. I recommend using the current files (taken from the Warrior database).
Next it is possible to configure the tools, i.e. for the MIT the user can select whether to centralize or temperature-compensate the data. The zoned variables can also be altered at this point.
Now select the maximum speed option and the calibrated curve data is plotted and is ready to use.
It is possible to recalculate the raw data as often as necessary should any changes need to be made.

30.4.8 Extras

There is a Calibration Pass option in UW Memlog; this can be found on the tool bar. This looks like the Visual Merge window and you select a calibration pass in the same way you would pick a log pass. Once a calibration pass is selected it can be sent to Warrior using the option in the File menu.
If calibration data has been recorded to memory this is the way to pass it to Warrior.
When the data is being passed to Warrior a cursor scrolls across the screen to show which data is being sent. In the Warrior Output Monitors the user can view the data, and the calibrations can be performed in the standard way.
Remember after performing calibrations it is recommended the service information in the UW Memlog project be updated.

Section

31

31 Noise Log

31.1 Services - Noise Survey

The Noise service is available on systems equipped with 330 digitizers and Model 250 and 5000 DSP boards. The signals from the noise tool are conditioned by filters and amplifiers in the tool interface panel and routed to the adc or dsp boards in the computer. The signal is sampled by digitizing for a user selectable time period e.g. 1 second. This sample is digitally filtered in the computer and divided into the conventional frequency components. The frequency spectrum and raw and filtered signals may be monitored on the computer screen. A number of samples may be averaged to produce a station reading for a given depth. The averaged frequency spectrum may be monitored on the computer screen.
Start the service from Services in the normal manner and power the downhole tool. A raw data monitor window is presented which has four signal displays corresponding to the conventional four peak to peak voltage ranges.

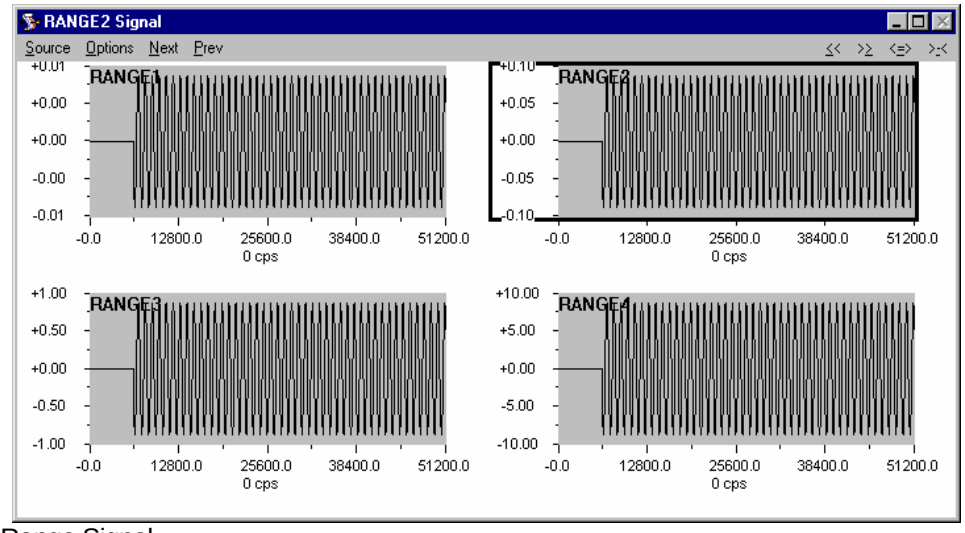


FIG: 31.1 Range Signal

The usual range of options associated with waveform monitors is available for this display. During operation the system automatically selects the most appropriate range for data collection.
The system also displays a window displaying the processed waveforms and frequency spectra.

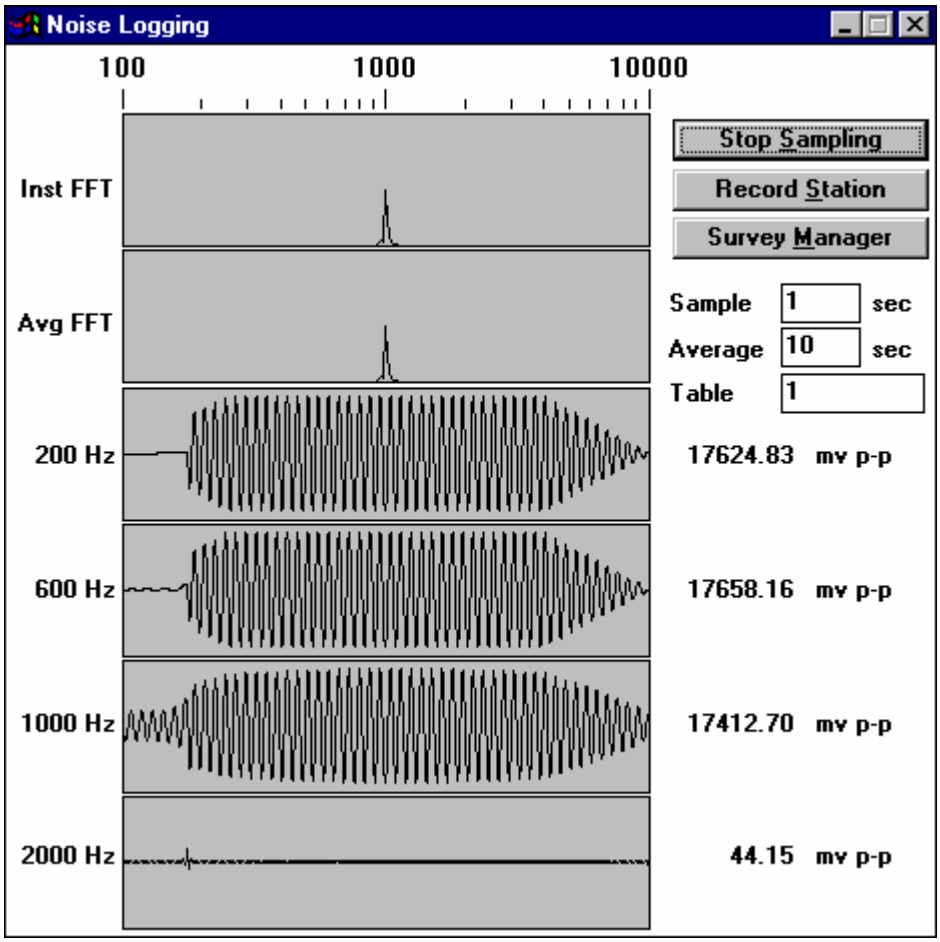


FIG: 31.2 Noise Logging Control

The survey is also controlled from this window.

31.2 To run the survey

Click on the Start Sampling button and signals should appear in the various windows. To record a station click on the Record Station button. With the parameters shown the system will take ten one second samples, average the results and record them as a depth station in a survey table.
To view the survey table click on the Survey Manager button. As each depth station is recorded the results are entered into the survey table as shown.

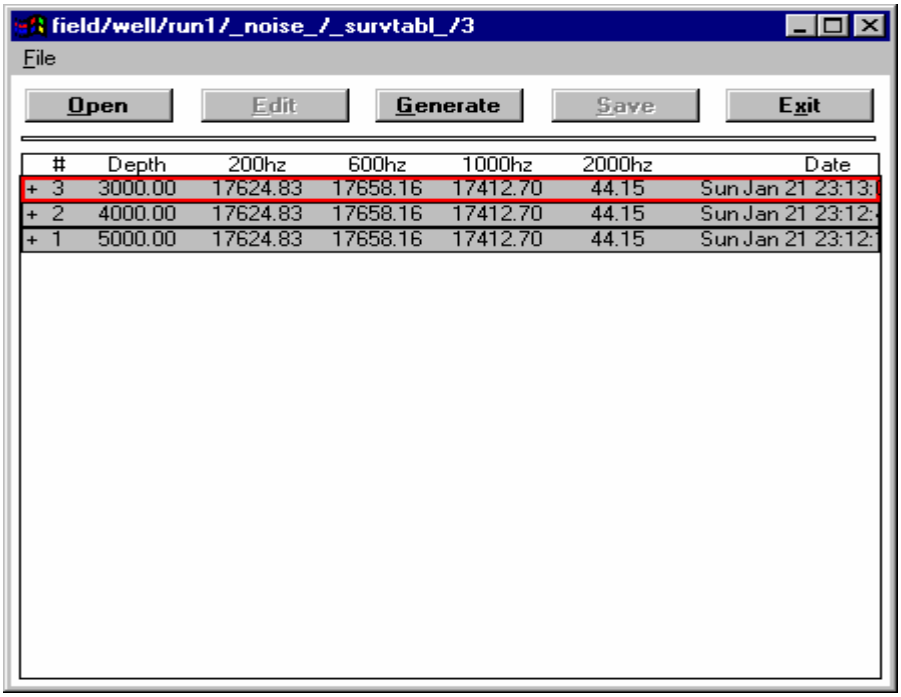


FIG: 31.3 Survey Manager

After all stations have been recorded the survey may be output as log curves and/or tabular results. If there are stations which need to be excluded from the final results this may be achieved by selecting the particular station in the survey table (by clicking anywhere in its line) and then clicking the Disabled box as shown below.

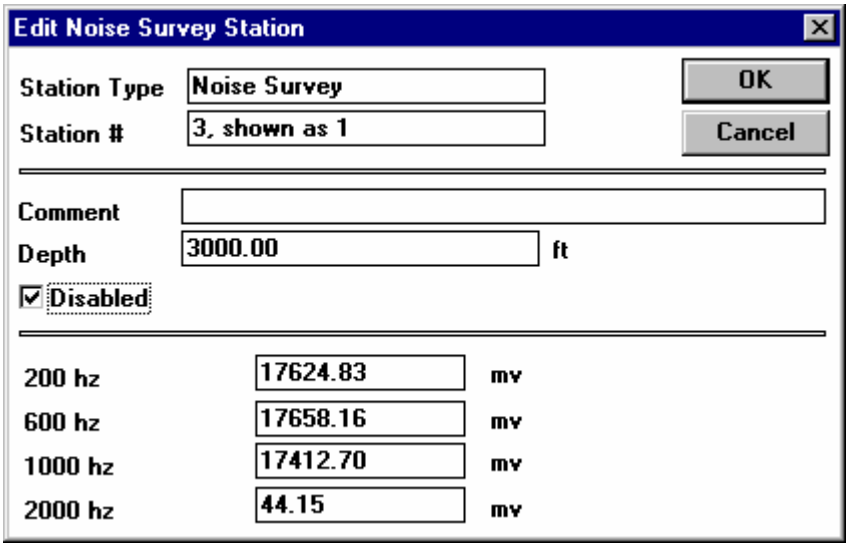


FIG: 31.4 Edit Survey Station

Clicking on the Generate button and Depth Log displays the window shown below.

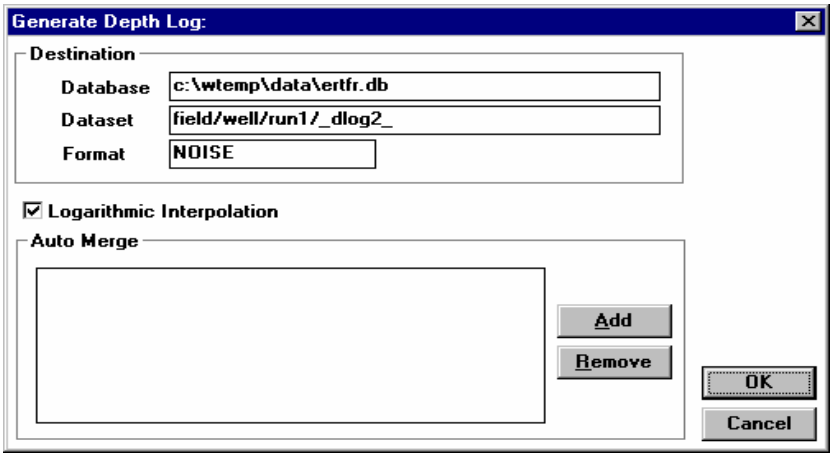


FIG: 31.5 Depth Log Format

The cryptic Dataset entry simply indicates what the resulting merged and interpolated log will be called. If a logarithmic display of the data is required then the Logarithmic Interpolation box must be checked. In this case the log presentation used must specify a logarithmic grid and a logarithmic curve.
Note that other curves e.g. CCL, may be easily merged with the noise curves using the Auto Merge feature. Clicking the Add button displays a list of the other curves present in the current database. At present it is not possible to merge curves from other databases by this method. Aliasing may be used to achieve this if required.

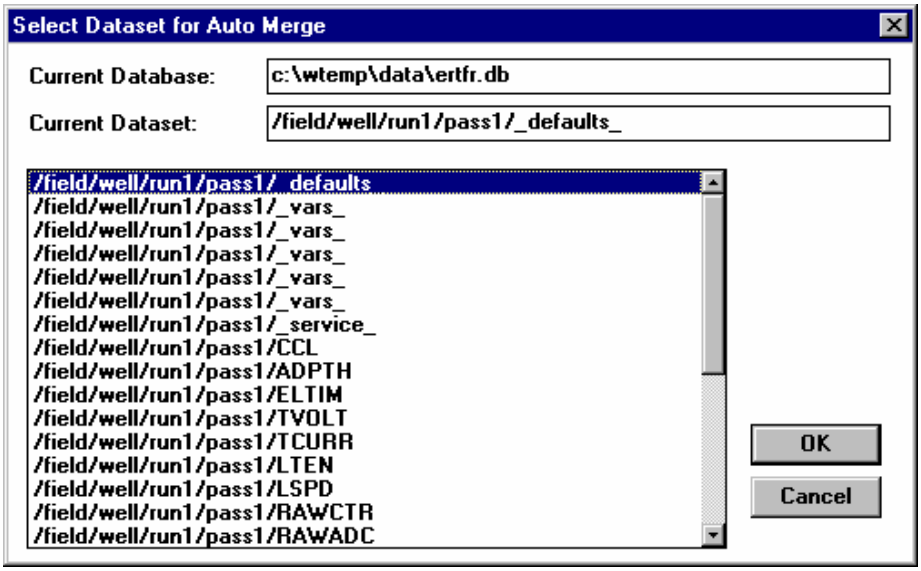


FIG: 31.6 Select Data set Auto merge

Double click on the curve(s) to be merged with the noise data. To generate the merged presentation click on the **OK** button and the merged log will be displayed on the screen. With long log intervals this may take several seconds.
Note that a merged presentation may be generated at any time in order to monitor the progress of the survey, e.g. after each depth station if required.
For final presentation a tabular output of the survey table may be added to log grid presentation when assembling the final plot using the Plot Job Editor.