ECHOTRAC MKIII

TFT MODULE
Version: 0.3

Odom Hydrographic Systems, Inc.
1450 Seaboard Avenue
Baton Rouge, Louisiana
USA
70810-6261

Telephone: (225) 769-3051 Fax: (225) 766-5122

Email@Odomhydrographic.com
http://www.odomhydrographic.com

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HYDROGRAPHIC SYSTEMS, INC.

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1 INTRODUCTION

The Echotrac MKIII TFT Module is designed to be interchangeable with the standard MKIII Thermal Printer Module and offers the following advantages:

- Display 16 bit acoustic data in real time in a profile window (similar to the printer) and simultaneously in a "signal window" (similar to an oscilloscope display).
- Logging of 16 bit data with associated GPS position for play back to the internal hard drive.
- A choice of display Algorithms that enhance the detail of the raw acoustic signal.

The TFT module consists of:

- High intensity backlit 800x600 pixel LCD module that is designed to be visible from darkness to full sunlight conditions.
- Windows Embedded NT operating system (write protected operating system).
- 40 GB shock mounted hard drive.
- 300 MHz Embedded Pentium Processor.
- 128 MB removable PCMCIA memory card.
- Ethernet interface.
- 128 MB DRAM.
- Ethernet Hub

The acquisition software running on the TFT module is supplied under license to Odom Hydrographic Systems, Inc. by Triton-Elics International, Inc. It is a highly customized version of their widely accepted data logging software. Odom's custom application is called **ChartView** and is part of a suite of available programs that can be purchased separately. Other modules include geo-encoding programs, post processing programs and mapping programs. The raw data files logged with the **ChartView** program are compatible with all of the other modules in the TEI suite of software programs (.XTF). ChartView is also available as a stand alone package for installation on a desk top or notebook PC.

The TFT module has connections for both a mouse and keyboard. These tools make navigating through the various windows and the menus easier. However, the essential task of displaying and logging data can be accomplished using the keys on the front panel of the module alone.

2 CONNECTIONS TO THE ECHOTRAC MKIII

There are three connections to the Echotrac sounder/chassis: the power connector and the two Ethernet connectors. All three connections are located on the side of the TFT Module closest to the hinge. The power connector is a brown, three-pin connector that can only be connected in one orientation. A CAT-5 Ethernet cable connects the LAN1 connector on the TFT Module to the Echotrac MKIII Ethernet Communication PC Board. The second Ethernet cable runs from the LAN2 connector of the TFT module to the rear panel mounted LAN connector on the MKIII chassis.

2.1 Mouse and Keyboard Considerations

Most of the functions in the ChartView program are accessible with the keys on the front panel. However all but very experienced operators will find it much easier to access the functions using a mouse and keyboard. If the user prefers to use a mouse, it must be plugged in before booting up the TFT module. The operator can plug in a keyboard while the TFT module is operational but the keys on the front panel will become inactive.

2.2 Starting and Shutting down the TFT Module

Once the Echotrac MKIII is turned on, a short period of time must be allowed for the TFT module to boot. Once the computer in the TFT Module is running Windows, the ChartView program will start running. If a problem occurs or the operator closes the ChartView program, there is a shortcut on the Windows desktop available to re-launch the program.

The operating system on the embedded PC inside the TFT module is protected with a write filter. Once it is time to switch off the MKIII, there is no need to boot down the operating system on the TFT module. Simply switch the Echotrac off.

2.3 Using the TFT front panel keys to control the program

2.3.1 Brightness

The TFT Module is equipped with a high intensity backlit LCD that is designed to work in sunlight or in a dark wheelhouse at night. To adjust the brightness of the backlight use these keys.

2.3.2 REW

Rewind: Press the REW key in order to change the scroll direction of the acoustic data in playback mode. Data runs backwards in time but always from the right side of the screen to the left side.

2.3.3 REC

Record: Starts logging when in real time mode.

2.3.4 Play/Pause

In real time mode, the Play/Pause key starts the acquisition mode and pauses the real time mode. In playback mode the Play/Pause key pauses the data once it is being replayed.

2.3.5 FF

Fast Forward: This key is used to change the scroll direction when in playback mode to go forwards.

2.3.6 F1

The F1 key serves the same purpose as a tab key on a standard personal computer keyboard. In conjunction with the F2 key it can be used to navigate around the application dialog boxes.

2.3.7 F2

This function key is used to set the focus for the selection of the enter key to the top of the current window. Press F2 followed by the Enter key to activate the main menu. Then use the arrow keys along the right side of the TFT Module to navigate within the selected menu.

2.4 Example of Using Keys to navigate the Menu

This example uses the keys on the front panel of the TFT Module to navigate from the Real Time mode to opening a file in Playback mode.

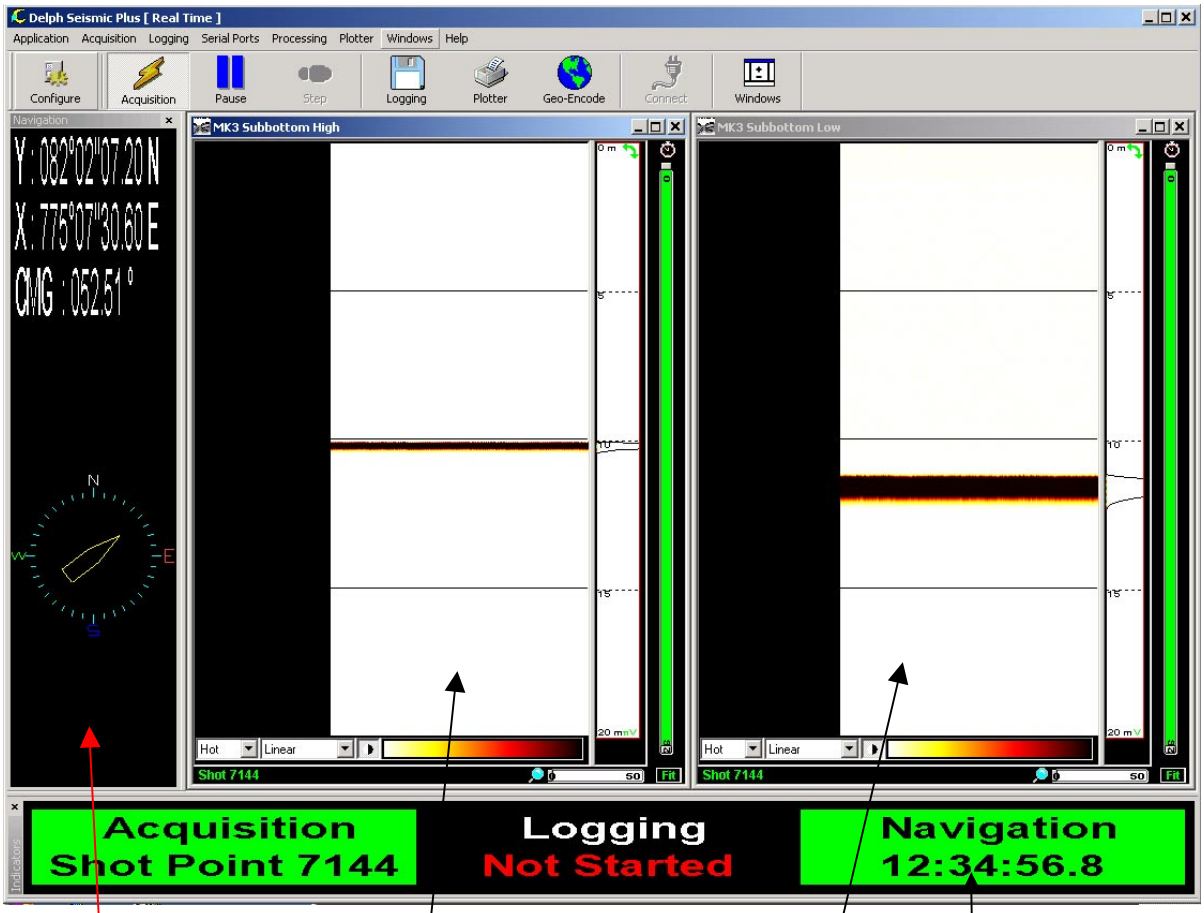
Press the **F2** key.
Press the **Right Arrow** key. The Application menu should be highlighted.
Press the **Enter** key. The Application menu should open up.
Press the **Down Arrow** key to Playback.
Press the **Enter** key. The program will start the Playback mode and open up an Open window.
Press the **F1** key until the files in the current directory are surrounded with a dotted box. Use the **arrow** keys to navigate to the correct file and press enter.

To change the directory, use the **F1** key to highlight the “Look in” window and press the **Down Arrow** key to expand the window. Use the arrow key to find the correct directory and press enter.

3 CHARTVIEW PROGRAM

The ChartView program has been adapted from TritonElics standard datalogger program to work with the Echotrac MKIII. As is common in the evolution of this type of software, several vestigial options and windows remain in the program that are not applicable in the ChartView application. The ChartView program has a real-time acquisition mode and a playback mode. Below is a typical set-up of the ChartView program during real-time acquisition mode with GPS data and both acoustic channels from the Echotrac MKIII activated.

Real Time Mode



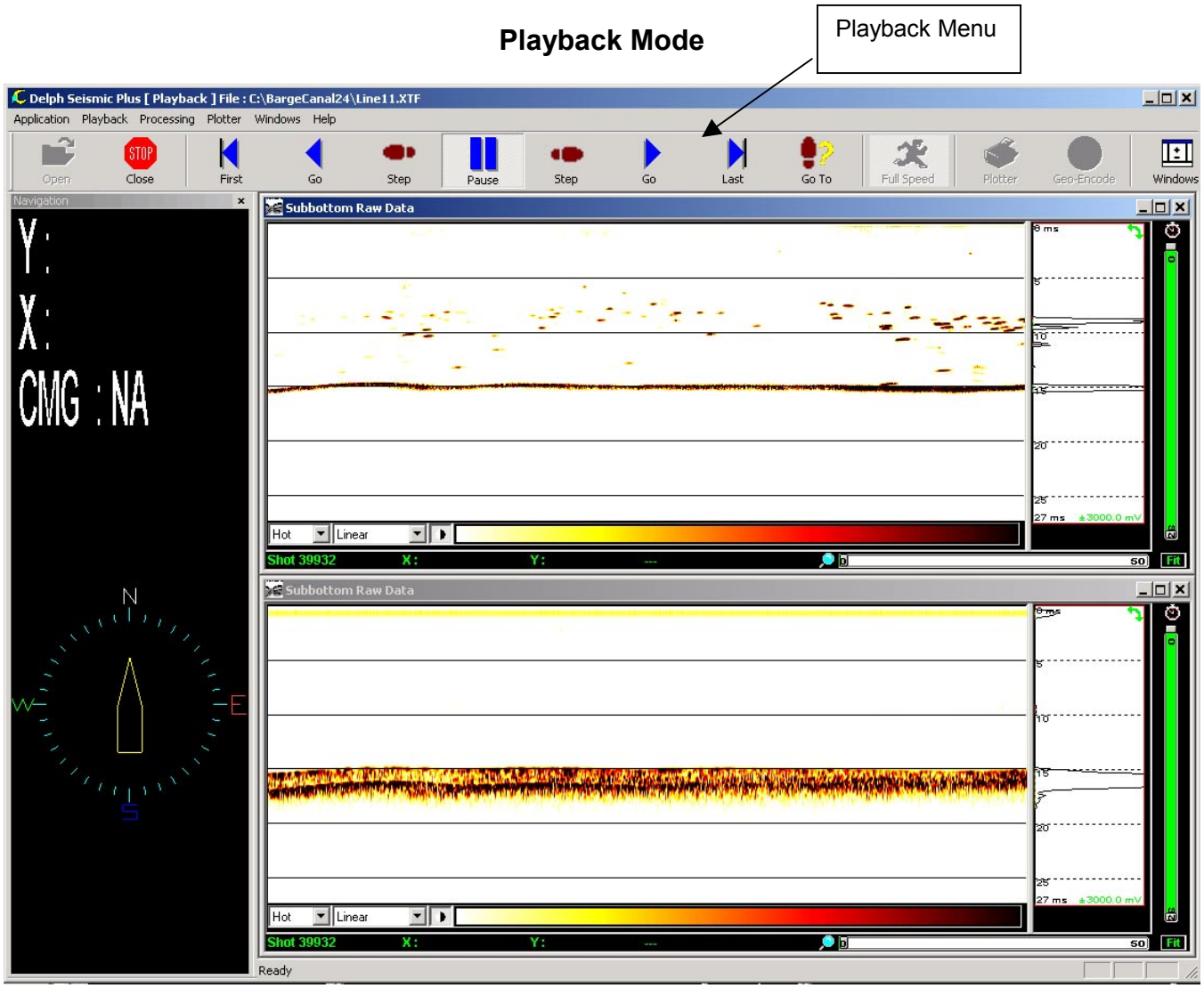
GPS Position in Navigation Window

High Frequency Channel in "MK3 Subbottom High" Window

Low Frequency Channel in "MK3 Subbottom Low" Window

Indicators Window

Playback Mode



3.1 Real-Time Acquisition Mode

The table below shows the different windows available in the Real Time Mode. The windows can be activated or deactivated in the Window Menu. The most useful windows are the profile windows, navigation window and indicators window. The best way to get a useful arrangement of the windows is to select the windows and then press the “tile vertically” or the “tile horizontally” buttons.

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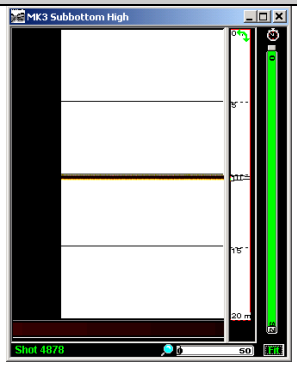
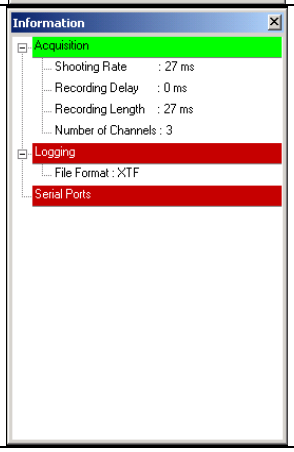
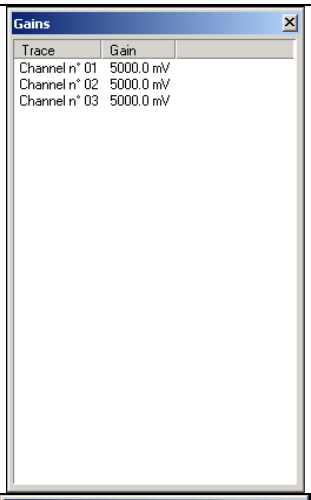
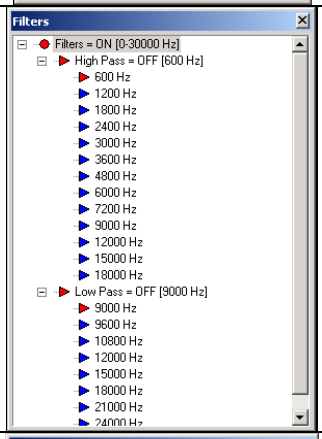
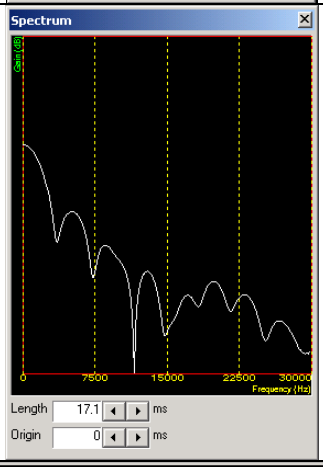
Window	Explanation
	**MK3 Subottom High, MK3 Subottom Low, MK3 Sidescan Window** Provides a scrolling display of the data for the duration of the window. The right side of the window has a time/amplitude display, which is extremely useful in viewing the return signal. The bottom of the window includes a menu bar for selecting the color pallets and different signal processing algorithms. Regardless of which algorithm is selected, only the raw data is logged. If the window is not large enough the menu bar on the bottom may not be visible. In this case resize the window and the menu bar will become visible. The sidescan window will be implemented in the future when a version of the Echotrac MKIII with 3 acoustic channels is completed.
	**Navigation Window** Shows the current Latitude, Longitude and heading of the vessel.
	**Information Window** Provides a text display of logging and navigation information. Red and green indicator boxes around the text provide a visual confirmation of acquisition and logging status.



Gains Window
Displays the maximum signal level of the data from the Echotrac MKIII and the maximum number of channels.



Filter Setting Window
Shows the current filter settings being applied to the data displayed on the screen. This window is not really useful for the Echotrac data.



Spectrum Window
Shows the frequency spectrum of the incoming signal.

Indicators Window
Provides a text display of logging and navigation information. Red and green indicator boxes around the text provide visual confirmation of acquisition and Logging.

3.2 Application Menu

3.2.1 Real Time

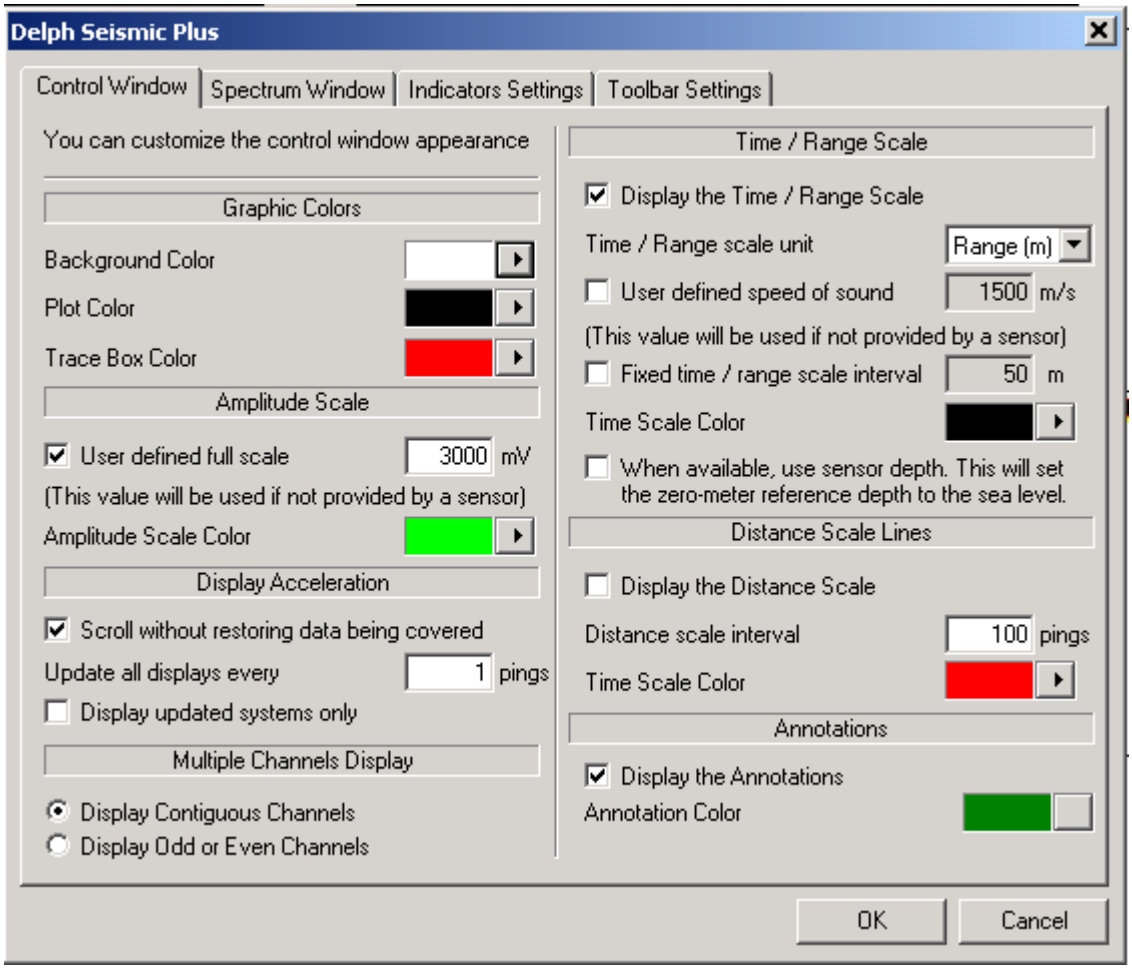
Starts the Real Time mode.

3.2.2 Playback

Starts the Playback mode.

3.2.3 Settings

This will open up a window for the display properties of both real time and playback mode.



3.2.3.1 Control Window

Graphic Colors
Sets the background color and plot color for the signal display in the profile window.

Amplitude Scale
Should always be set to User defined, full scale checked.

Display Acceleration
Scroll without restoring data being covered is best left checked. Update all displays every _, allows the program to display the data once for every number of pings the user enters. This helps the CPU conserve processor time when updating the display. The “Display updated systems only” check box will make ChartView open and close the number of profile windows, depending on which channels are active on the Echotrac.

Time/Range Scale
The display Time/Range Scale check box will display the scale on the profile window next to the signal level scale. The operator can set the scale to either meters, feet or time. The Time Scale color will set the color of the scale lines in the profile window.

The “When available, use the sensor depth. This will set the zero-meter reference depth to sea level” check box is very important. When checked, ChartView will shift the data to compensate for the draft and index values entered in the Echotrac. If not checked, the draft and index parameter values will **NOT** be applied.

Distance Scale Lines
These settings determine whether vertical scale lines are plotted in the profile window.

Annotations
Determines whether annotation information, sent to the MKIII through the serial port, is displayed on the screen.

3.2.3.2 Spectrum Window

Sets the color for the data displayed in the Spectrum Window.

3.2.3.3 Indicator Window

Sets the time out alarm for the Indicator Window.

3.2.3.4 Toolbar Settings

Sets the options for the size of the icons on the toolbar and whether they are visible.

3.3 Acquisition Menu

3.3.1 Start/Stop, Pause

These parameters parallel those selectable via the toolbar. As one would expect, they start and stop the acquisition mode.

3.3.2 Acquisition Parameters

This parameter sets the Ethernet UDP port number the Echotrac uses to send data to the TFT Module. This should always be set to 1600.

3.3.3 Select and Acquisition Device Type

Launches the server program, which interfaces the Echotrac data with the ChartView program. This is useful for trouble shooting to determine if the TFT Module is receiving data.

3.4 Logging Menu

3.4.1 Start/Stop

These are the same parameters available on the toolbar and they start and stop the logging of data.

3.4.2 Configure Logging Parameters

Sets the logging parameters for the data. Always logs data to the internal hard drive and only uses the PCMCIA card to transfer data, as the PCMCIA card is not fast enough to log data in the real-time mode nor does it have adequate capacity to accommodate the large .XTF files generated by the SW.

Line Name
Assigns the prefix for the logged data file name.

Line Switch Mode
Determines when the program automatically switches to a new file.

Start logging and acquisition at the same time.
If checked, the program will start logging data as soon as acquisition is turned on.

3.5 Serial Ports Menu

This menu is not applicable when the program is used with the Echotrac.

3.6 Processing Menu

This menu is only applicable if the program is supplied with the post processing option and is covered in a different menu. The processing program allows the user to Geo-Encode the depth data with position data. The user can then view the entire line of data and edit the digitised line.

3.7 Plotter Menu

This menu is not applicable to the Echotrac.

3.8 Windows Menu

This is the standard Windows menu, which allows the user to select the different windows to view and whether to cascade them. The windows available are discussed in section 3.1.

3.9 Starting the Acquisition mode

To start the Acquisition mode, either press the acquisition button with the mouse or press the play button on the front panel. To select which channels are displayed on the screen go to the Windows menu and select the active channels. Note: the channels must be turned on the Echotrac before they are visible on the screen. To start logging the data, press the logging button with the mouse or press the record button on the front panel.

3.10 Playback Mode

The playback mode can be accessed be going to the Application menu and selecting the Playback option. Acquisition must be turned off before the user and switch to the Playback mode. Once in Playback mode the menus are the same as the Acquisition mode, except for the playback menu, which also changes the toolbar. The default directory for opening up logged data files is the same one that is set through the logging menu.

3.11 Playback Menu

3.11.1 Open, Close…

Opens the files to play back. Data should only be logged to the D drive. All the logged files are of the .XTF type. Once the file is opened the user can change any of the parameters such as color, signal processing algorithm or different window configurations just as when the data is being collected in real time. Before opening up a new file the user must close the current file.

The rest of the selections in the Playback menu are self-explanatory. To play the data backwards or forwards the operator can use the keys on the front panel.