iFR-IV

Integrated Field Recorder Unit

Hardware Manual
Version 1.2

How to contact us

Binary Acoustic Technology is a web-based business.

Web: www.binaryacoustictech.com
E-Mail : info@binaryacoustictech.com

SPECT'R LICENSE AGREEMENT

This user license agreement (the "AGREEMENT") is an agreement between you (individual or single entity) and Binary Acoustic Technology, for the SPECT'R embedded software (the "SOFTWARE") that is accompanying this AGREEMENT. USE OF THIS PRODUCT CONSTITUES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS.

The iFR-IV is sold preloaded with SPECT'R EMBEDDED SOFTWARE. The SOFTWARE is the property of Binary Acoustic Technology and is protected by copyright laws and international copyright treaties. The SOFT-WARE is not sold, it is licensed.

EMBEDDED VERSION

If you accepts the terms and conditions of this AGREEMENT, you have certain rights and obligations as follow:

YOU MAY:

1.	Use one copy of the EMBEDDED VERSION in conjunction with each Binary Acoustic Technology iFR-IV ultrasonic field recorder unit.

YOU MAY NOT:

1.	Sublicense, rent or lease the EMBEDDED VERSION or any portion of it.
2.	Decompile, disassemble, reverse engineer or modify the EMBEDDED VERSION or any portion of it.
3.	Distribute copies of the EMBEDDED VERSION without written consent from an authorized representative of Binary Acoustic Technology

TRANSFER OF LICENSE

	You may transfer your license to another individual or single entity on a permanent basis provided that you retain no copies and the recipient agrees to the terms of this Agreement. Notice must be given by you to Binary Acoustic Technology that such a transfer has taken place.

WARRANTY DISCLAIMER

The SOFTWARE is supplied "AS IS". Binary Acoustic Technology disclaims all warranties, expressed or implied, including, without limitation, the warranties of merchantability and of fitness for any purpose. The user must assume the entire risk of using the SOFT-WARE.

DISCLAIMER OF DAMAGES

Binary Acoustic Technology assumes no liability for damages, direct or consequential, which may result from the use of the SOFTWARE, even if Binary Acoustic Technology has been advised of the possibility of such damages. Any liability of the seller will be limited to refund the purchase price.

Chapter 1 : Unpacking

1.1 : What you should have received

The iFR-IV package includes:

One iFR-IV Field Recorder Unit.
One MIC-01 Ultrasonic Microphone element
One MIC cable
One AC to DC power converter
An assortment of cable adapters

Optional accessories:
One LCD controller ...or...
One Console cable assembly

1.2 : Minimum system requirements

The iFR-IV is a sonic and ultrasonic field recorder that is designed to be used as a standalone field recording system.

To operate the iFR-IV and generate recordings you will need to provide the following additional components:

A USB operated storage device such as
  - A USB Thumb drive
  - A USB external drive
  - A Compact Flash drive with USB interface

An LCD control or laptop computer is required
to setup and configure the iFR-IV.

Chapter 2 : Hardware

2.1 : Internal Panel Connectors

The internal panel of the iFR-IV is illustrated above. From left to right, the top panel holds two **LED indicators**, an RS-232 **console connector,** two **USB host ports**, and a **power button**. These are described below.

2.1.1 : LED Indicators

The two **LED indicators** on the internal panel display the current state of the iFR-IV. One of the indicators is labeled "Active" while the is labeled "Recording".

The LED indicator states associated with the LED patterns is shown below

Active LED	Recording LED	Unit Status
OFF	OFF	Unit is powered off
ON	ON	Unit is booting up or Powering down
FLASHING	OFF	The unit is expecting an AR receiver, but no receiver was found
ON	OFF	The unit is idle
ON	FLASHING	The unit is recording a snapshot and/or transferring recordings to storage

A typical startup sequence is as follows:

1) The iFR-IV is off and both LEDs are off.
2) The operator pushes the power button and both LEDS turn on.
3) Both LEDs remain on for 60 seconds as the unit boots up.
4) When the unit is ready the Recording LED will turn off.

The Recording LED will flash when ever the unit is recording or archive snapshots. In addition both LEDs will be simultaneously on as the unit prepares to power down. They will turn off when the unit powers off.

2.1.2 : Console Connector

The **console connector** is an DB9-based RS-232 port which is centered near the front of the panel. The console connector can be used to setup and/or control the unit using a laptop computer.

For information on how to setup the console cable and setup the iFR-IV, please review chapter 4 of this manual.

2.1.3 : USB Host Ports

The panel includes two USB host ports. One is labeled as "USB 1.1" and the other is labeled as USB 2.0. Each port can support multiple functions, however there is one restriction; only the USB 2.0 port will support an AR receiver or a Blue Icicle XLR adapter.

The recommended use of each of the ports is outlined below and marked with an asterisk.

USB Port	LCD	Storage	Audio Interface	AR Receiver/ Blue Icicle XLR adapter
USB 1.1	YES*	YES	Future	NO
USB 2.0	YES	YES*	Future	YES

2.1.4 : Power Button

The **power button** powers the unit on and off. In addition, holding down the power button for more than 15 seconds will force the unit to restart in the event of a system error.

The power button functions as follows:

1) When iFR-IV is powered off a single press of the button will power up the unit and start the boot-up cycle. Both LEDs will turn on and remain on until the iFR-IV is fully booted up and operating. The boot up operation takes about 30 seconds.

2) When the iFR-IV has finished the boot-up cycle, the power button can be used to turn the unit off. Press and hold the button for four seconds and then release. This will start the power down cycle. During the power down cycle the internal memory is first copied to the external storage and then the unit will power off.

3) If a system error occurs and the iFR-IV becomes unresponsive, the unit can be reset by pressing and holding the power button for 15 seconds. The LEDs will flash briefly indicating a system reset. Note that resetting the iFR-IV in this manner loses all the programming changes that were entered during the current session.

Current state	Button Action	Operation
Unit is OFF	Press and release	Unit will power on
Unit is booting	Press and release	No operation. Unit ignores button while booting up
Unit is active	Press and release	The unit will power up USB ports to operate LCD Controller
Unit is active	Press and hold for 4 seconds	The unit will attempt to archive any internal memory and then power down
Any State	Press and hold for more than 15 sec.	The unit will perform a hard reset and reboot cycle

2.1.5 : Simple deployment operation

Once the iFR-IV has been configured properly (see sections 3 and 4), it can be deployed without using any other equipment. The **power button** supports the basic functions needed to turn the system on, turn the system off, or reset it if there are problems.

A simple deployment protocol is as follows:

1) Open up the iFR-IV lid and verify that it is off.
   A) If on, press and hold power button for four seconds and then release. The Recording LED should start flashing. Wait until both LEDs turn off.
2) Connect MIC to right panel EXT connector.
3) Connect storage to USB 1.1 connector using angled adapter.
4) Press and release power button to turn on iFR-IV.
5) Wait until only Active LED is on.
6) Close and latch the top.

A simple data retrieval protocol is as follows:

1) Open up the iFR-IV and verify that it is off.
   A) If on, press and hold power button for four seconds and then release. The Recording LED should start flashing. Wait until both LEDs turn off.
2) Swap out storage device
3) Press and release power button to turn on iFR-IV.
4) Wait until only Active LED is on.
5) Close and latch the top.

To power down the unit and pack it up for redeployment:

1) Open up the iFR-IV, if off, press power button to turn on.
2) Wait until only the Active LED is on.
3) Press and hold power button for four seconds. The Recording LED will start flashing. Wait until both LEDs turn off.
4) Disassemble the system and pack it up.

To reset the system in case of a problem hold the power button for more than fifteen seconds.

2.2 : Left Panel Connectors

The left panel of the iFR-IV is illustrated above. From left to right, the left panel holds the 12V **power** connector, and the RJ-45 **internet access connector**, These are described below.

The **power connector** supplies 12V to 18V DC power to the unit which is used to recharge the internal batteries and/or power the unit. It can also be used to expand the battery capacity by connecting an external 12V deep cycle battery. The power connector supports one of three options:

    1) An iFR-IV 15V AC/DC power converter.
    2) An external 12V deep cycle battery
    3) A 12V rated Solar Panel.

We recommend use of a 20 Watt solar panel for most solar power applications.

The **internet access connector** is an RJ-45 internet port. It allows the iFR-IV to be connected to the internet through a direct connection, wireless access point, or cellular modem. It is primarily intended to supports remote file transfer operations.

2.3 : Right Panel Connectors

The right panel of the iFR-IV is illustrated above. It contains the eight pin **MIC input connector.**

The **MIC input connector** is used to connect the iFR-IV with a MIC-01 ultrasonic microphone element. Connect one end of the EXT microphone cable to the iFR-IV and the other end to the MIC element.

Note: the MIC should only be connected or disconnected from iFR-IV while the unit is powered off.

2.4 : Optional LCD controller module

The LCD controller is an optional module that simplifies iFR-IV configuration and operation. The LCD controller is a standalone module that plugs into one the iFR-IV USB ports. It consists of an LCD character display along with six push buttons; up, down, left, right, enter and exit.

The LCD controller presents an interactive menu-driven interface that allows the operator to monitor and/or change the iFR-IV configuration at both the office and in the field. The controller is attached to check and setup the iFR-IV and then removed afterward. It is not intended to be connected all of the time.

2.5 : Console Cable

The console cable, for the iFR-IV, is a simple null modem cable. It contains female DB-9 connectors on both ends. One end of the null modem cable plugs into the console port on the rear panel of the iFR-IV and the other end plugs into a DB-9 serial port. Note that many newer computers and laptop computers no longer support DB-9 serial connectors. In this case you will also need to use the DB-9 based USB to serial port adaptor and plug it into one of the laptop USB ports.

The console cable is only necessary when configuring the iFR-IV using a laptop or desktop computer. You do not need to use this if you intend to use the LCD controller module

2.6 : Notes on USB connectors and disk drives

According to the USB specification, each USB connector is only required to supply 2.5 Watts of power. This is plenty of power to handle many types of small external disk drives. An example would be the Western Digital Passport drives. However, if you use a large disk drive you will need to supply power directly to the drive using a external power adaptor.

The iFR-IV is designed to be closed up for weather protection while operating. Most of the smaller USB drives are thin enough to fit under the lid, however an angled USB cable adapter is required.

Two types of angled USB adapters are included with the iFR-IV. One is an angled USB to mini-B connector that will work with USB drives and the other is an angle USB to A Female connector that can be used with Thumb drives. To connect a disk drive, simply connect it to one of the iFR-IV USB connectors. The iFR-IV will automatically detect and mount the drive.

The iFR-IV only works with disk drives that are formatted as FAT32. The recommended format is FAT32 with a 32K allocation size. Third party tools such as FAT32 Format are available on the internet for formatting the large disk drives that can not be formatted using Windows 7.

Before disconnecting a disk drive, **you must power down the iFR-IV first**. This will safely and automatically dismount the drives and allow them to be removed. Otherwise, the disks may be corrupted because they were removed prematurely.

To power down the iFR-IV, press and hold the power button for four seconds. Then wait until both LEDs are turned off. Alternatively, you can power down the iFR-IV using the LCD controller, or by typing *halt* at the console command prompt.

2.7 : Notes on using Blue Icicle XLR adapter

The Blue Icicle XLR adapter is used to interface high quality XLR microphones to the iFR-IV for audio recording applications such as bird recording.

The Blue Icicle XLR adapter must be connected to the iFR-IV USB 2.0 port. Once connected the adapter should not be removed until the recording session has been completed and the iFR-IV is halted and powered down.

When using the Blue Icicle adapter for audio recording the following settings must be changed:

Input device selection:	USB
Time Expansion:	1
Low Frequency:	(reset to desired audio low freq)
High Frequency:	(reset to desired audio high freq)

2.8 : Notes on networking

The iFR-IV is pre-configured to auto detect an external network device, but it assumes that it is operating on a local subnet of 192.168.1.x. It is also programmed to use 192.168.1.1 as the local gateway. This means that you will need to program your network interface equipment accordingly.
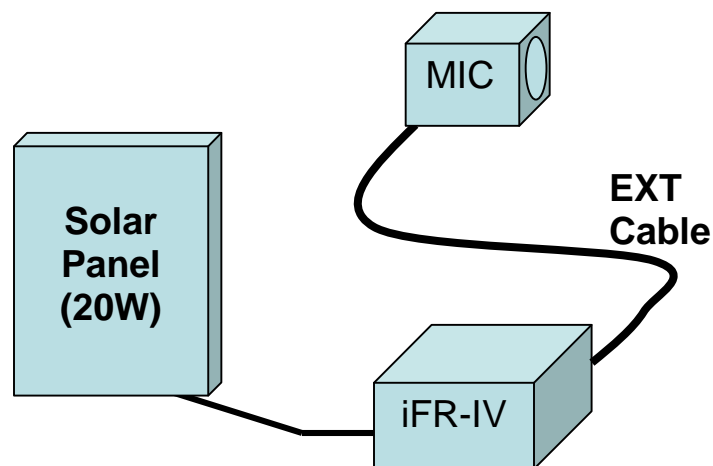
Any wireless access port or cellular modem should be configured to respond as a gateway to local address 192.168.1.1. We have tested and verified proper operation on LinkSys network and wireless gear as well as the Sierra Wireless Raven-X cellular modems.

If you have other needs please contact us and we will help you re-configure the iFR-IV to suit your situation.

2.9 : Example of Typical Monitoring Station

A long duration monitoring station includes:

      1) An ultrasonic microphone.
      2) An iFR-IV field recorder.
      3) A storage device, either a thumb-drive or USB drive.
      4) A Solar panel

An overnight monitoring station only requires the iFR-IV and microphone. Under normal conditions the iFR-IV will operate up to three nights on a full charge. This can be extended to a week using an external 18 Ah deep cycle battery.

A long term monitoring station requires the addition of a 20W or larger solar panel. The panel must be placed in an open space and have an unobstructed view of the sky for at least five hours a day.

Chapter 3 : Configuring using the LCD controller

3.1 : Overview

The simplest method of configuring the iFR-IV is by using the LCD controller module. We will describe this method first, here in chapter three. If you plan to use the serial console, please skip this and move on to chapter 4.

The LCD controller attaches to the iFR-IV using one of the USB ports. We recommend using the LCD controller interchangeably with the AR125 receiver if you are using an AR125 in the system. In other words use either the LCD controller or the AR125 but not both at the same time.

It takes approximately sixty seconds for the iFR-IV to boot up. While booting the LCD screen will be blank. Then after 60 seconds the banner will appear as shown below.

Once the banner appears, press any key to access the menu.

This section assumes the iFR-IV is programmed with firmware version 3.2.2 or above.

LCD Controller Module

3.2 : Navigating the Menu System

The menu structure is organized as one main menu along with several submenus which are organized by function. The main menu allows the operator to navigate and choose basic functions and the submenus allow the operator to change or configure specific settings.

The menu is navigated by pressing one of the six available buttons on the controller. The buttons are up, down, left, right, enter, and exit. The direction buttons are self explanatory. The enter button has the green check mark and the exit button has the red X.

To scroll through a menu press the up or down buttons. To move into a submenu or to edit a setting press the enter button. To back up press the exit button. The left and right buttons are only used for editing text, time, and date fields.

3.3 : Special Cases

Navigating the menu is fairly intuitive, however, there are a few special cases:

1) The exit button (red X) has an additional function when editing text. If you move the cursor all the way (right) to the end of the line, then the exit button will act as a delete button.
2) Pressing the exit button to exit an edit window does not undo any changes. You must complete your selection before exiting the edit window.

3.4 : The Main Menu

The main menu is the top level menu. To access the main menu from the splash panel, press any key. Otherwise press the exit button to back up until the main menu appears.

Use the up and down buttons to navigate through the main menu. Note that the main menu has eight entries, but only three are displayed at a time. The controller will display additional entries as you navigate up and down.

The main menu includes the following entries:

      1) Time   - time setting functions
      2) Status   - Status and operational settings
      3) Settings   - Record settings
      4) Program 1   - Program 1 settings
      5) Program 2   - Program 2 settings
      6) File Xfer   - Remote file transfer settings
      7) Save   - Save the current settings
      8) Show Log   - Log report monitor
      9) Archive   **-** Transfer files to external storage
      10) Cleanup   - Clean the internal storage
      11) Power   - Power control (halt,reboot,..)
      12) SW Update   - iFR-IV firmware update

To select and entry, simply navigate the blinking cursor to the entry and press the enter button. If the entry is a configuration value, then an Edit menu will appear allowing you to check and/or modify the current value. It the entry is a submenu then a new menu list will be presented.

Each of the main menu entries will be described in the sections which follow.

3.4.1 : The Time Submenu

The time submenu allows the operator to check the date and time of the iFR-IV units internal clock.

To enter the Time submenu, select the Time entry in the main menu and press the enter key

The time submenu will appear with the following entries:

1) Date   MM:DD:YY
2) Time   HH:MM:SS
3) Save

To change either the time or date you must first select either the time or date fields in the time submenu (using up and down keys) and then press enter. This will bring up the corresponding edit menu

In the edit menu, use the left and right buttons to select the field to change. Then use the up and down buttons to change the value.

As an example, to change the month, navigate to the Date entry on the Time submenu and press enter. This will bring up the Edit Date menu. Next press the left arrow twice to move the cursor to the month position and then use the up and down arrows to change the month. Once your change is complete press the enter key to complete the edit operation.

Once the date and time are set properly you must save the current values by navigating to the Save entry and pressing the enter key. This stores the date and time into the iFR-IVs internal clock. Any changes that are not saved will be lost.

Special case: to generate real time updates to the displayed date and time press and hold either the left or right buttons.

3.4.2 : The Status Submenu

The Status submenu allows the operator to check and modify higher level operational settings.

To enter the Status submenu, select the Status entry in the main menu and press the enter key

The time submenu will appear with the following entries:

1) State   [Running or Stopped]
2) Batt   [Battery charge in %]
3) GPS   [Status of GPS reciever]
4) Mode   [Triggered or Continuous]
5) Input   [USB or Mic]
6) Format   [Wav or WavPack]
7) File   /filename
8)Comment <file comment>

To change a status setting, navigate to the entry you wish to change and then press the entry key to edit it. Once the edit menu appears, use the up and down keys to choose the desired settings and then press enter again when you are finished.

The *state status* indicates whether or not the recorder is currently running (recording) or if it is stopped. Normally the recorder will be running unless one of the two timed programs is active. If a program is active then the recorder will only indicate that it is running during the specified record time.

The *battery status* indicates the current charge state of the battery. When the battery is fully charged the battery status will indicate 100%.

The *GPS status* indicates the current state of the GPS receiver if a receiver is installed in the unit. Pressing the enter key at the GPS status entry brings up a monitoring display which tracks the current time and position of the iFR-IV unit.

The *Mode* status indicates which record mode will be used. In triggered mode the iFR-IV acts as a voice activated recorder and will generate individual snapshots. In continuous mode, the iFR-IV will generate one large continuous file. Triggered mode is recommended for general bat recording.

The *input status* indicates which connection is used for the recording. The iFR-IV supports: 1) a USB connection for the Binary Acoustic Technology ultrasonic receivers or a Blue Icicle XLR converter for audio microphones, and 2) a Mic connection that supports Binary Acoustic Technology EXT microphone elements.

Note: when you change the input selection you must restart the iFR-IV so it will switch inputs (see section 3.4.7).

The *Format* status indicates which format is being used in the output recording. The iFR-IV supports two formats. The first is the industry standard *.WAV audio format. The second is an open source compressed audio format called WavPack. The compressed audio format is recommended because it only requires one third of the disk space. It is also loss-less and does not reduce the recording quality

The *File* status displays the current base file name selection. By base file name, we mean that the file name of all recordings will start with this name. The recorder will automatically assign a date and time code and append it to this name.

The *Comment* status indicates the current comment that will be inserted into the attribute section of each recording.

Both the *File* and *Comment* fields are text field. To change the text fields use the left and right buttons to set the character position and then use the up and down buttons to select the character. To erase characters use the right button to move the cursor past the end of the text and then use the exit button to backspace and erase characters.

3.4.3 : The Settings Submenu

The Settings submenu allows the operator to check and modify the lower level operational settings.

To enter the Settings submenu, select the Settings entry in the main menu and press the enter key

The settings submenu will appear with the following entries:

1) Thresh   [value]
2) TE   [value]
3) Dur   [value]
4) Idle   [value]
5)Delay   [value]
9) Low F   [value]
7) High F   [value]
8) PopFilt [on,off]
9) PwrSave [on,off]

To change any of these status settings, navigate to the entry you wish to change and then press the entry key to edit it. Once the edit menu appears, use the up and down keys to choose the desired settings and then press enter again when you are finished.

The *Threshold setting* controls the triggering threshold for voice activated recording. The default setting is 18.0. The recommended range is 15.0 to 21.0. Lower threshold settings increase the sensitivity of the detector.

The *Time-Expansion (TE) setting* sets the time expansion factor that will be used in the recording. A time expansion of 10 is recommended.

The *Duration setting* sets the length of time activated snapshots in the number of seconds. A value of 1.0 selects snapshot of one second duration.

The *Idle setting* is used to specify an idle time out in seconds. If an idle timeout is specified than recording will be terminated early if no activity is detected for the specified period of time. As an example, to emulate the Anabat "bat pass" format. The snapshot duration is set to 15 seconds and the Idle time out is set to 3 seconds. This will create recordings up to 15 seconds long, but the files will be ended early if no activity is detected for 3 seconds.

The *Delay setting sets* the minimum delay time between recordings in seconds. If a delay is specified then the recorder will delay snapshot creation for the specified time period following each recording. The delay setting is mainly for backwards compatibility with earlier time expanded detection systems that can not create back to back recordings. It is only recommended to use this feature if you are trying to compare results and need to limit the iFR-IV capability.

The *Low Frequency and High Frequency settings* control the call detection triggering. They can be used to limit the frequency bands of interest and keep the iFR-IV from generating unwanted recordings. The default low and high frequency settings are 15.0 and 90.0 KHz respectively.

The PopFilt setting controls the operation of the internal Pop Filter. The pop filter is a significant new feature in the iFR-IV system which is used to scrub files and reduce the number of false triggered files produced by the recorder and saved to disk. Under most circumstances the pop filter should be enabled. It is a bat/bird specific filter that will reduce the number of non-bat and non-bird recordings.

The *PwrSave* status indicates whether or not the power save option is enabled. If the power save option is enabled then the iFR-IV will power down and sleep during the times that it is not recording. The power save option should be turned on for most applications. The only exception is if the unit is required to remain on for cold weather applications.

3.4.4 : The Program Submenus

The Program submenus allows the operator to check and modify the two operation timer programs.

To enter the Program submenu, select the desired Program entry in the main menu and press the enter key

The settings submenu will appear with the following entries:

      1) Enable   [On or Off]
      2) Start   HH:MM:SS
      3) Stop   HH:MM:SS
      4) Days   SMTWTFS

To change any of these status settings, navigate to the entry you wish to change and then press the entry key to edit it. Once the edit menu appears, use the up and down keys to choose the desired settings and then press enter again when you are finished.

The *Enable setting* determines if the program is enabled or not. Enabled programs are active and immediately take control of the iFR-IV. Disabled programs are inactive.

The *Start setting* selects the time of day that the program will start recording. To edit the start time, navigate to the Start entry and press enter. When the Edit Start menu appears use the left and right keys to select between the HH MM and SS entries and then use the up and down keys to change the values. Press enter again when you are finished.

The *Stop setting* selects the time of day that the program will stop. To edit the stop time, navigate to the Stop entry and press enter. When the Edit Start menu appears use the left and right keys to select between the HH MM and SS entries and then use the up and down keys to change the values. Press enter again when you are finished.

The *Days setting* selects the day-of-week (SMTWTFS) that the iFR-IV will operate. The day-of-week order is Sunday through Saturday. Any days filled in with a dash (e.g. S-T-T-F-) are by-passed such that no recording will be performed.

3.4.5 : The File Transfer Submenu

The File Transfer submenu allows the operator to check and modify the configuration of the remote file transfer capability.

To enter the File Transfer submenu, select the File Xfer entry in the main menu and press the enter key

The file transfer submenu will appear with the following entries:

1) Mode   [Off, Log, or All]
2) Limit   [Transfer limit in MB]
3) Host   www.hostname.com
4) Dir   <root directory on host>
5) Log In   [On or Off]
6) User   <username>
7) PassWd <password>

To change any of these status settings, navigate to the entry you wish to change and then press the entry key to edit it. Once the edit menu appears, use the up and down keys to choose the desired settings and then press enter again when you are finished.

The *Mode setting* determines which files the remote file transfer will sent. In Log mode, the file transfer program will transfer only the log files. In All mode, it will transfer all recordings. Transferred files will be placed in the specified directory on the specified host computer.

The *Limit setting* specifies the daily transfer limit in Mbytes that can be used to transfer snapshot recordings. It is useful for situations were air time is limited. If the limit is set to zero, then the limit is disabled and all files will be transferred.

The remaining settings are used to configure the iFR-IV and set it up to access the computer that will receive the files. In order to set it up properly you will need to know the internet address of the receiving computer, the directory you wish to put the files into and any login information required to access the directory.

The *Host setting* specifies the name of the computer that the files will be sent to. It can either be a resolvable web address such as ftp.binaryacoustictech.com or it can be an IP address.

The *Directory setting* specifies the root directory of the host. By convention, remote file transfer uses UNIX style path names like "/ftp/detector1". Note: UNIX uses the forward slash '/' rather than the backslash '\'. This should be set to the directory where you intend to store the recordings.

If your ftp site requires a login, then set the *Log In setting* to on and edit the username and password settings to reflect the required login account information.

3.4.6 : The Save Submenu

The Save submenu allows the operator to save the current settings to permanent storage.

To enter the Save submenu, select the Save entry in the main menu and press the enter key. The unit will save all changed entries to internal non-volatile storage.

3.4.7 : The Archive Submenu

The Archive submenu allows the operator to start an archive operation which transfers all of the files in internal storage to an external storage device that is plugged into one of the iFR-IV USB ports.

3.4.8 : The Show Log Submenu

The Show Log submenu allows the operator to monitor the most recent log file entry.

To enter the Show submenu, select the Show Log entry in the main menu and press the enter key. This will bring up an updating display of the most recent log entry.

To exit the show log submenu press the exit button.

3.4.9 : The Power Submenu

The Power submenu allows the operator to choose one of four power states. The iFR-IV supports On, Halt, Reboot, and Restart.

To enter the Power submenu, select the Power entry in the main menu and press the enter key. This will bring up the Edit power menu. Then use the up and down keys to change the power state selection.

Here is a description of the power states:

       On   - The iFR-IV will remain on and running
       Halt   - The unit will be halted and powered off
       Reboot - The unit will be powered off and restarted
       Restart - The unit will simply restart the software

To exit the Power submenu press the exit button.

Note: once the iFR-IV is halted, the **power button** must be pressed to turn the unit back on.

3.4.10 : The Cleanup Submenu

The Cleanup submenu allows the operator to clean the internal storage device. Using cleanup deletes all data currently stored on the internal storage device. It is useful when starting a new collection and not wanted to mix old and new data.

3.4.11 : The Software Update submenu

The iFR-IV firmware allows the user to update the firmware using the LCD controller. To update the firmware, please follow the following steps:

1) Download the latest firmware revision from Binary Acoustic Technologies FTP site (ftp.binaryacoustictech.com/ftp/pub).

2) Place the firmware file in a folder called "BATUpdates" on a thumbdrive.

3) Insert the thumbdrive into the iFR-IV

4) Select the SW Update menu on the LCD controller and press the enter button.

3.4.12 : Saving the iFR-IV settings

Important note: Once all of desired settings have been entered they should be saved using the Save menu. Alternatively, the iFR-IV can be <u>Rebooted</u> or <u>Restarted</u> in order to transfer the settings to permanent storage.

The recommended procedure for configuring the iFR-IV is the following:

1) Change the iFR-IV settings to the desired settings.
2) Save the settings using the Save menu.

Chapter 4 : Setup using the serial console

Chapters 4 and 5 discusses the iFR-IV setup using the console cable along with a laptop computer. If you plan to use the LCD controller you can skip these two chapters.

4.1 : Assembling the Console cable

The console cable is a null modem cable as described in section 2.4.

1) Plug one end of the null-modem cable into the iFR-IV.
2) The other end of the cable plugs into a DB-9 serial port on the computer your are using to configure the iFR-IV. If the laptop or computer does not have a DB-9 serial port than you will need to install and use a USB to serial adapter that you can purchase from you local electronics store.

Notes:

You will need to know the COM port number of the console cable in order to setup the Windows terminal emulator properly. To determine the COM port assignment:

A) Click on *Start => Control Panel*
B) Choose *Performance and Maintenance*.
C) Choose *System.*
D) Click on the *Hardware* tab and click on *Device Manager*.
E) Find and click the "+" icon on the device manager entry that says:

  + Ports (COM & LPT)

This will bring up an entry that indicates the COM port assignment (e.g. COM3 or COM4). Remember this number for the next step.

4.2 : Hooking Everything Up

Place the iFR-IV along with a laptop computer on a stable working surface and perform the following:

1) Power up the laptop and login if necessary.
2) Connect the console cable between the iFR-IV and a laptop computer as described in section 4.1.
3) On the laptop, open up the terminal emulator.
4) Configure the terminal emulator for 115200 baud, 8 bits, and no parity. For explicit instructions on how to setup the Putty terminal emulator, read section 4.3.
5) Connected the supplied AC/DC converter to the iFR-IV and plug the power cord up to an AC receptacle. Press the power button. Both of the inner panel LEDs will light up.

At this point, the iFR-IV will power up and begin its boot process. The boot process usually takes around sixty seconds and once the boot process completes the iFR-IV will open a connection to the console and begin to interact with the terminal.

Be patient, **the boot process take about 30 seconds**. During this time boot-up information will appear on the terminal screen. After 60 seconds the recorder program will start and it will write a banner and command to the terminal screen. At this point, the iFR-IV is ready to operate.
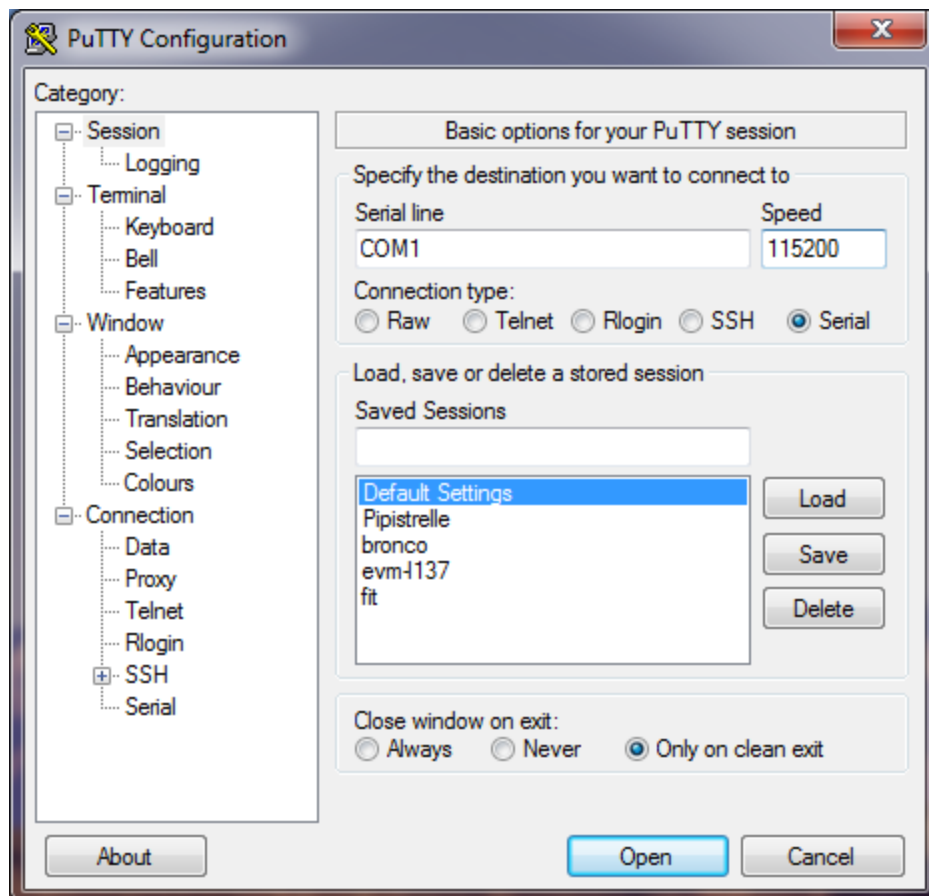
If the iFR-IV has already booted, press the carriage return key a few time and the iFR-IV command prompt will appear.

4.3 : Configuring the Putty Terminal Emulator

We recommend using the Putty terminal emulator if you plan to configure the iFR-IV using a Windows laptop. Putty is available as a free download from www.putty.org.
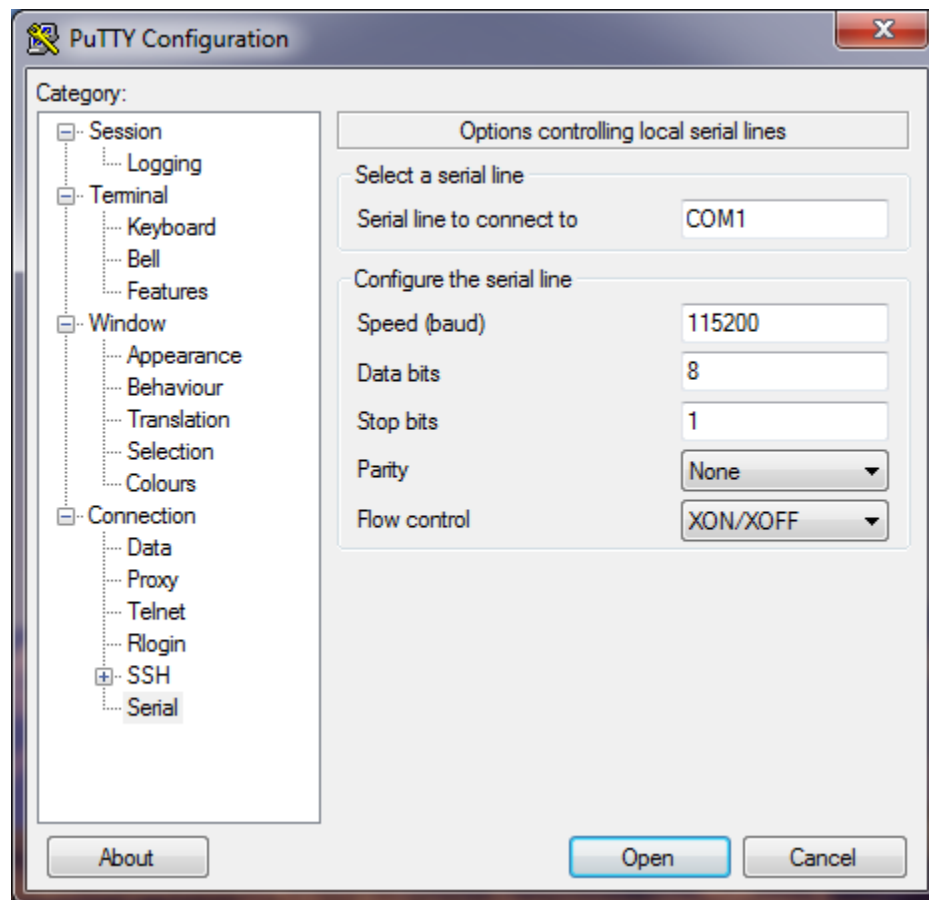
Please note that before opening and configuring Putty, the console connector (section 2.4) must be plugged into the laptop or computer. If the drivers are not already installed you will be asked to place the driver disk into the computer and follow the instructions.

Once everything is connected, open up the Putty terminal as illustrated below. Click on the Serial radio button as the connection type. and verify that the Serial line COM setting matches the port number you determined in section 4.1.

Next, click on the Connection=>Serial entry on the right side of the screen set the serial options to **115200 baud, 8 data bits, no parity, 1 stop bit**, as shown below. Then, press Open.

If everything was configured properly then the terminal window will open and connect with the iFR-IV and you can move on to the next section to configure the recorder settings.
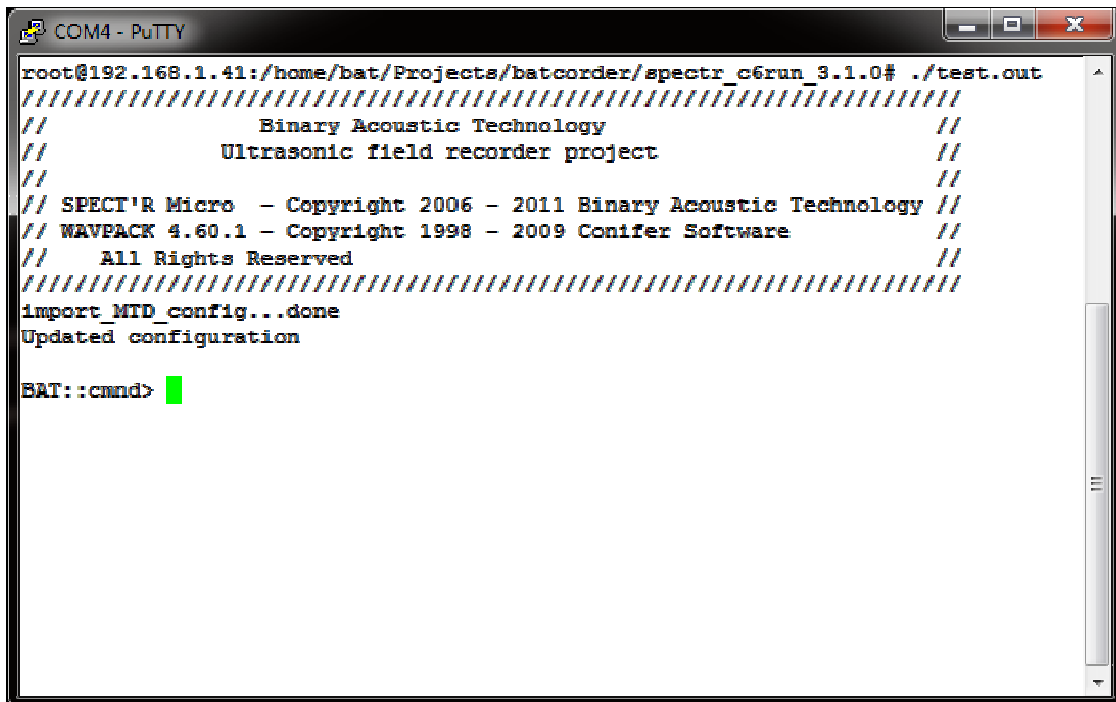
Chapter 5 : Configuring the iFR-IV using Putty

5.1 : Overview

The iFR-IV can be configured using the laptop and running Putty. Once power is applied the unit will boot up and connect to the terminal through the console port. As mentioned previously, it takes approximately sixty seconds to boot up. While booting the terminal screen will display boot information. Then after 60 seconds the banner and command prompt will appear as shown below.

For Windows systems we recommend using Putty. For Linux systems, we recommend using minicom.

```
root@192.168.1.41:/home/bat/Projects/batcorder/spectr_c6run_3.1.0# ./test.out
////////////////////////////////////////////////////////////////////////////
//                  Binary Acoustic Technology                            //
//                Ultrasonic field recorder project                      //
//                                                                         //
// SPECT'R Micro   - Copyright 2006 - 2011 Binary Acoustic Technology //
// WAVPACK 4.60.1 - Copyright 1998 - 2009 Conifer Software             //
//    All Rights Reserved                                                  //
////////////////////////////////////////////////////////////////////////////
import_MTD_config...done
Updated configuration


BAT::cmnd>
```

Configuration is then performed by typing commands in a similar fashion to the Windows DOS screen.

5.2 : Displaying the current status

To display the current status type, *show status*. The display
will update with the status screen.

```
COM4 - PuTTY                                            —  □  X
import_MTD_config...done
Updated configuration

BAT::cmnd> show status

    Date and Time:  03:07:2012::19:52:29

    Recorder      : Running

    Input         : USB (AR125)

    Record Mode   : Triggered

    Base Filename: /test
    File Format   : WAV
    User Comment  : BAT FR125 Field Recording Unit

    Input Device  : <Not found>
    Storage Device: /home/bat/data
    Audio Device  : <Not found>

    Battery [%]   : 93.4

BAT::cmnd>
```

The status screen displays:

      1) The current date and time (MM:DD:YYYY::hh:mm:ss)
      2) The recorder status
      3) The input mode selected (USB, or MIC)
      4) The record mode selected (Triggered or Continuous)
      5) The base file name used on each recording
      6) The current file format (either WAV or compressed WAV)
      7) The user comment which will be added to each recording
      8) The input device name, if present.
      9) The storage device name, if present.
      10) The output audio device name, if present.
      11) The current battery state

The status screen allows you to quickly check that the recorder is
configured properly and that it is recognizing all of the devices that

33

5.3 : Updating the status

Several of the status settings can be updated by the operator.

To reset the date and time type:

      set date *MM:DD:YYYY::hh:mm:ss*

      Where: MM = month, DD = day, YYYY = year
             hh   = hour, mm = minute, ss = second

To change the base file name type:

      set file *filename*

      Where *filename* is replaced with the desired name

To change the file format type:

      set compression 0   - selects standard wav format
      set compression 1   - selects compressed file format
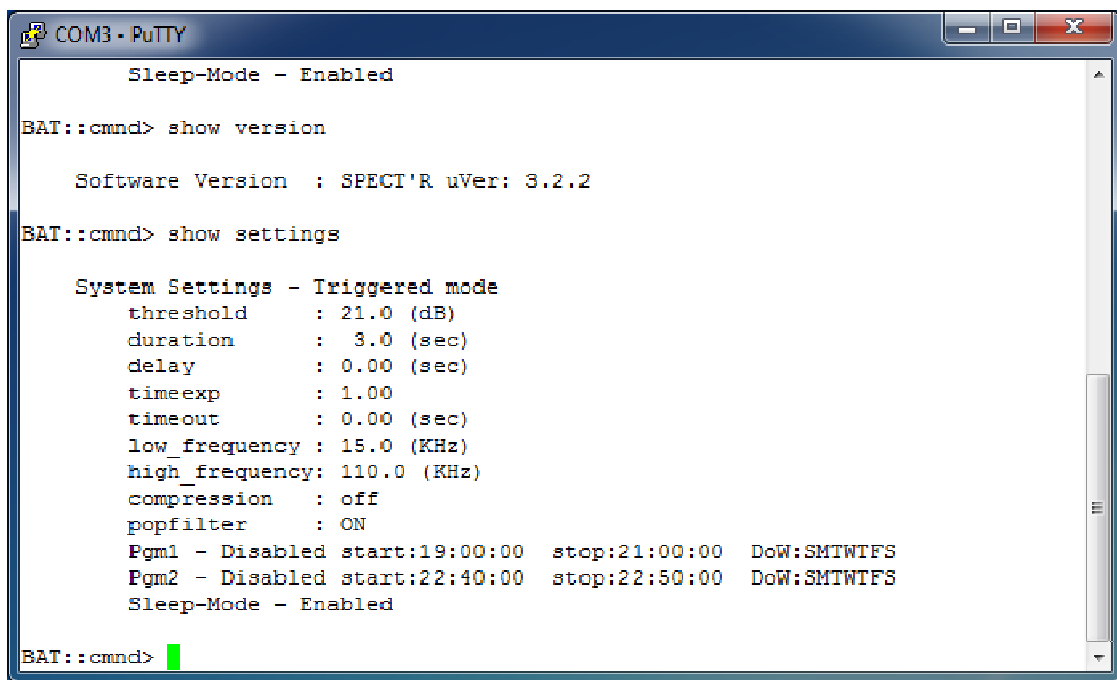

Finally to update the file comment type:

      set comment <put your user comment here>

Once you have update the status fields type *show status* to review.

Note on file format: The only analysis tools that currently support the WAVPACK compressed file format are **SPECT'R**, **SCAN'R**, and **SonoBat** (www.sonobat.com)

5.4 : Displaying the record settings

To display the current record settings type, *show settings*.
The display will update with the settings screen.

```
COM3 - PuTTY

             Sleep-Mode - Enabled

BAT::cmnd> show version

    Software Version  : SPECT'R uVer: 3.2.2

BAT::cmnd> show settings

    System Settings - Triggered mode
        threshold     : 21.0 (dB)
        duration      :  3.0 (sec)
        delay         : 0.00 (sec)
        timeexp       : 1.00
        timeout       : 0.00 (sec)
        low_frequency : 15.0 (KHz)
        high_frequency: 110.0 (KHz)
        compression   : off
        popfilter     : ON
        Pgm1 - Disabled start:19:00:00  stop:21:00:00  DoW:SMTWTFS
        Pgm2 - Disabled start:22:40:00  stop:22:50:00  DoW:SMTWTFS
        Sleep-Mode - Enabled

BAT::cmnd>
```

The settings screen displays:

1) The snapshot trigger threshold
2) The snapshot duration
3) The minimum delay between snapshots
4) The detector time expansion
5) The idle timeout period
6) The low frequency filter cutoff
7) The high frequency filter cutoff
8) Whether or not file compression is enabled
9) Whether or not the pop filter is enableed
10) The status of both operation timer programs
11) Whether or not the power saving sleep mode is enabled

Like the status screen, the settings screen also allows you to quickly
check that the record settings are configured properly.

5.5 : Changing the record settings

All of the record settings can be changed by the operator. The command syntax is similar to that used for the status updates.
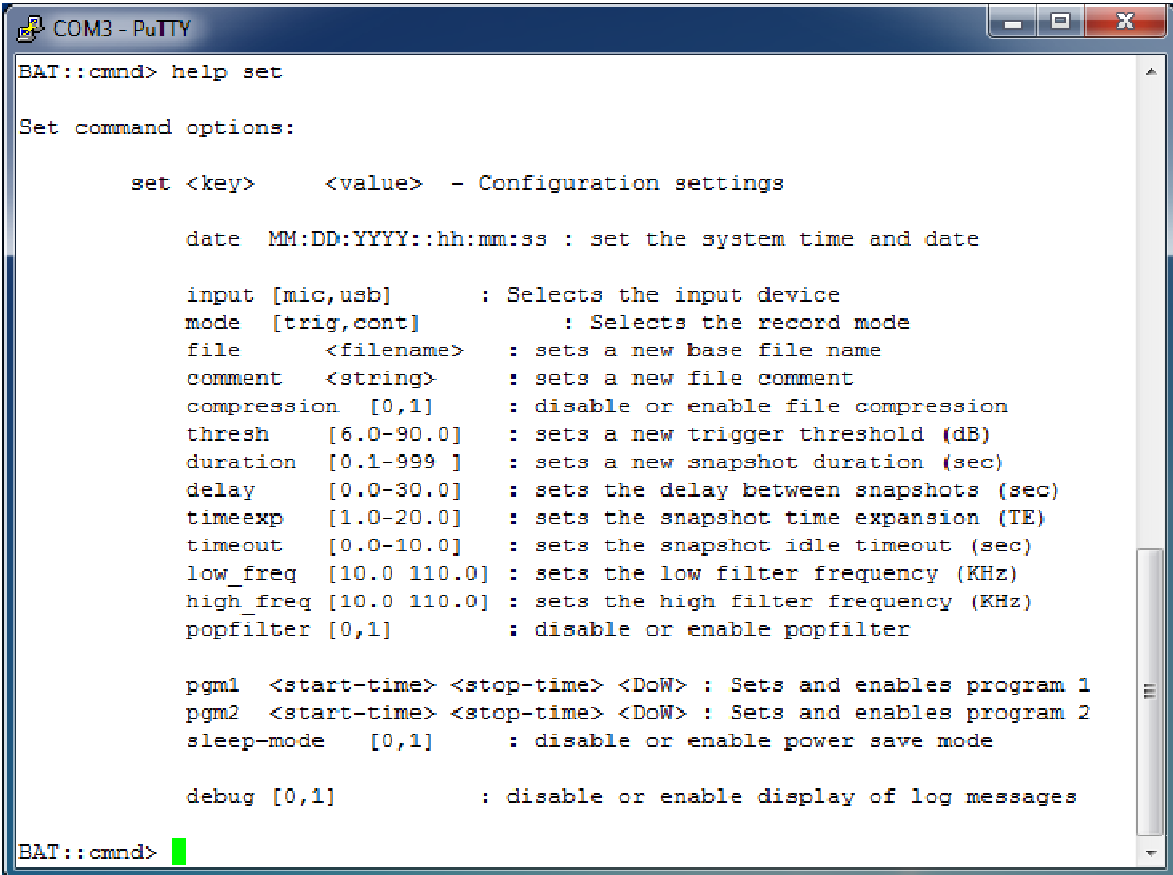
The basic command format is:

set <key> <value>

Where <key> is setting name and <value> is what you want to change it to. For a complete list of the tag/value pairs, type "help settings" at the command prompt (see list below).

For example, to set the input to the mic, type:

set input mic

```
COM3 - PuTTY
BAT::cmnd> help set

Set command options:

        set <key>      <value>  - Configuration settings

            date  MM:DD:YYYY::hh:mm:ss : set the system time and date

            input [mic,usb]      : Selects the input device
            mode   [trig,cont]        : Selects the record mode
            file         <filename>  : sets a new base file name
            comment    <string>    : sets a new file comment
            compression  [0,1]      : disable or enable file compression
            thresh     [6.0-90.0]   : sets a new trigger threshold (dB)
            duration   [0.1-999 ]   : sets a new snapshot duration (sec)
            delay      [0.0-30.0]   : sets the delay between snapshots (sec)
            timeexp    [1.0-20.0]   : sets the snapshot time expansion (TE)
            timeout    [0.0-10.0]   : sets the snapshot idle timeout (sec)
            low_freq   [10.0 110.0] : sets the low filter frequency (KHz)
            high_freq  [10.0 110.0] : sets the high filter frequency (KHz)
            popfilter  [0,1]        : disable or enable popfilter

            pgm1  <start-time> <stop-time> <DoW> : Sets and enables program 1
            pgm2  <start-time> <stop-time> <DoW> : Sets and enables program 2
            sleep-mode    [0,1]     : disable or enable power save mode

            debug [0,1]             : disable or enable display of log messages

BAT::cmnd>
```

A list of the available key value setting pairs

5.6 : Description of the record settings

5.6.1 : Filename

The **filename** setting selects the base file name that is used for all of the recordings. This base file name is the initial string used for each file which will be appended with a standard time-stamp.

As an example, if the filename is set to "windfarm-detector1" all recordings will be start with this filename, but will have a timestamp appended similar to:

windfarm-detector1_D20080223T182401m123

The timestamp format is:

D<YYYY><MM><DD>T<hh><mm><ss>m<milliseconds>

5.6.2 : Comment

Comments are useful because they allow the operator to add collection details which will be placed into the files as they are recorded. The comments can be read back and displayed on playback or analysis, giving important reference information about the original collection.

To enter a comment, simply type the following:

set comment <place any comment here>

Once recorded, the comments can be read by SPECT'R, SCAN'R, or SonoBat.

5.6.3 : Volume

The **volume** control sets the output level of the headphone jack. In normal operation, the user will choose a specific volume setting to meet their comfort level. However, the volume control does have a special setting. If you set the volume to 0 (zero), the iFR-IV will disable the associated audio processing to conserve CPU cycles and power. It is recommended to keep the volume at zero when you don't require audio output.

5.6.4 : Gain

The **gain** control sets the level of the line or microphone input. The setting will depend on the detector used. Try a setting of 20 first and then increase or decrease the value from there to meet your needs.

5.6.5 : Threshold

The threshold setting controls the call detection triggering sensitivity of the iFR-IV..

The snapshot generator monitors the input of the receiver and sets a triggering threshold based on measurement of the receiver Noise Floor (NF) along with the users specified threshold (i.e. sound pressure difference). For example, if the threshold is set to 10 dB, then snapshot triggering will not occur until the call energy is 10 dB above the receiver noise floor. This technique is quite handy, especially in cases where the background noise changes throughout the day.

The default **threshold** is 18.0 dB. Significantly changing this value can alter your collection results.

5.6.6 : Duration

The **duration** setting controls the maximum snapshot length in seconds. The default duration is 1.0 second, but the iFR-IV will support any duration in the 0.1 to 30 second range.

5.6.7 : Delay

The **delay** setting controls the delay between snapshots. Any non-zero delay will keep the iFR-IV from generating another snapshot for a specific interval upon completion of each snapshot. The delay setting is used to regulate snapshot creation if necessary. For example, if you wish to emulate a Time Expansion detector, the delay must be set to 10 times the duration.

No delay is necessary, but the default delay is set to one-tenth of a second.

5.6.8 : Timeout

The **timeout** setting is a special feature that allows the recorder to generate variable length snapshots based on activity detection. Call activity must be detected within the specified timeout interval, otherwise the recording will be terminated.

The **timeout** setting works in conjunction with the **duration** setting. Duration sets the maximum size of the file and the timeout sets the activity detection limits. As an example, to emulate the Anabat systems "bat-pass" file, the timeout should be set to three (3) seconds and the duration should be set to fifteen (15) seconds. This creates files that are up to fifteen seconds in length, but terminate early if no call activity is detected for three seconds.

5.6.9 : Frequency selectivity filter

The iFR-IV includes a versatile triggering filter which limits the frequency range that is used to trigger snapshots. The default range is 15 KHz to 90 KHz. This range was chosen to keep the iFR-IV from triggering on human audible sounds like birds, frogs and geese and, at the same time, to allow the iFR-IV to trigger on all ultrasonic sounds up to the full range of an AR125 receiver.

The filter settings can be modified by the operator. To change the range set new **low_freq** and **high_freq** values as shown below:

>   set low_freq 18.0

>   set high_freq 110.0

5.6.10 : File compression

The iFR-IV includes a built in file compressor. The file compressor operates much like the popular zip utility. It saves disk space by compressing the recordings as they are being recorded to disk.

The iFR-IV supports two output formats, standard wave files (*.wav) and compressed wave files using the open source WAVPACK format.

The compressed files are roughly one-third the size of standard wave files. The WAVPACK file compressor was chosen because it is a lossless compression technique and produces superior results. WAVPACK is open source software and is licenses under the BSD Software License by Conifer Software.

Important note: all Binary Acoustic Technology software supports WAVPACK files. However, use the standard format if you plan to analyze the recordings using SonoBat.

5.6.11 : Time Expansion

The time expansion value allows the recorder to interpret the input from time expanded bat detectors. It should be set to match the time expansion of the detector. For example the Pettersson D240x supports time expansions of either 10x or 20x. Check the D240x switch position and then update the recorders time expansion value accordingly.

The time expansion setting when using an AR125 ultrasonic receiver is not critical, but it is normally set to 10 (10X) to maintain file compatibility with the SonoBat analysis software.

When using standard microphone inputs the time expansion should be set to 1 (1X). This effectively informs the recorder that the input is not time expanded so that it will record in real time.

5.6.12 : Selecting the input source

The iFR-IV will record one of three input sources; 1) an AR125 ultrasonic receiver plugged into one of the USB connectors, or 2) a Binary Acoustic Technology EXT microphone plugged into the EXT connector.

The iFR-IV must be configured for the proper input sources.

To support an AR125, type: **set input usb**

To support a Blue Icicle XLR adapter, type: **set input usb**

To support an EXT mic, type: **set input mic**

Note: When the input source is changed, the iFR-IV will automatically restart and activate the selected input device.

5.6.12 : Program Timers

One of the powerful features of the iFR-IV is the program timers. The program timers are used to define times of the day (or night) in which the recorder will become active. The iFR-IV include two program timers that can be used to configure up to two recording sessions per day. The iFR-IV also includes a power saver mode which puts the iFR-IV into a low power sleep mode during the times that it is not recording.

To enable the program timer, type:

      set <pgm1|pgm2> <start time> <end time> <SMTWTFS>

For example, to setup a recording session that will start at 6 PM and run until 2 AM, type:

      set pgm1 18:00:00 02:00:00

The above command sets the start and stop times, and it also automatically enables the program.

To disable a program, type:

      disable <pgm1 or pgm2>

The iFR-IV also supports a day-of-week programming option. This constrains the operation to only certain days of the week. To program the unit to only operate on certain days add a day of week string to the end of the program settings. The ordering of the string is Sunday through Saturday ("SMTWTFS"). Put a dash "-" in place of any entry you wish to disable. For example to record only on Monday, Wednesday, and Friday, type:

      set pgm1 18:00:00 02:00:00 –M-W-F-

The power saving feature saves power by putting the iFR-IV unit into a low power sleep mode while it is not actively recording. To enable power saving, type:

set sleep 1

While in sleep mode the iFR-IV will not respond to commands and it will only wake up prior to the next record session. To manually wake the iFR-IV from sleep mode, you must press the power button. Remember to disable sleep mode before reconfiguring the settings, otherwise the iFR-IV might inadvertently fall asleep on you.

5.6.13 : Record Mode

The iFR-IV supports two different record modes, triggered and continuous.

In triggered record mode the iFR-IV acts as a "voice-activated" recorder and will only record when ultrasonic energy is detected. The triggered recording mode is primarily intended for ultrasonic bat detection and recording applications.

In continuous mode the iFR-IV acts as a continuous recording device. It records continuously, storing the data into a stream of back to back snapshot files. The continuous recording mode is primarily intended for normal audio recording sessions such as employed in bird detection applications.
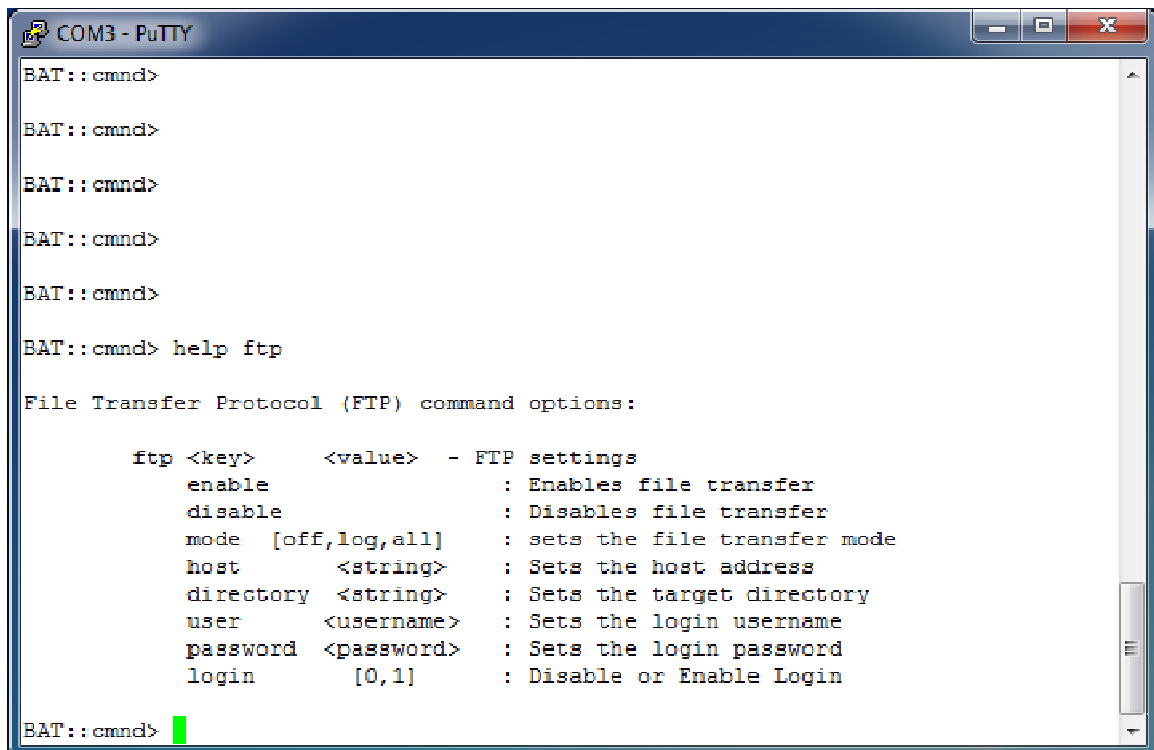
Ether of these modes will work with the program timers. This allows either triggered (bat) or continuous (bird) recording sessions to automatically activate during specified times of the day or night.

5.7 : Remote File Transfer

The iFR-IV includes a built in remote file transfer capability that will automatically transfer snapshots to a another computer over the internet. This allows the iFR-IV to be deployed in remote locations over an extended period of time, and it removes the need to periodically visit the collection site to recover data. Instead the data is sent back to you.

The file transfer feature is setup using the "ftp" command. To view a list of the available commands type *help ftp* as shown below.

The file transfer feature works over any standard internet connection including: a wired RJ45 Ethernet connection, a wireless Ethernet connection, or an Ethernet-enabled cellular modem such as the Sierra Wireless Raven-X modem. It supports the standard FTP protocol which includes error detection, correction, and packet retransmission to guarantee error free file transfer.

```
BAT::cmnd>


BAT::cmnd>


BAT::cmnd>


BAT::cmnd>


BAT::cmnd>


BAT::cmnd> help ftp


File Transfer Protocol (FTP) command options:


        ftp <key>      <value>   - FTP settings
               enable               : Enables file transfer
               disable              : Disables file transfer
               mode   [off,log,all] : sets the file transfer mode
               host        <string> : Sets the host address
               directory  <string>  : Sets the target directory
               user       <username> : Sets the login username
               password   <password> : Sets the login password
               login         [0,1]   : Disable or Enable Login


BAT::cmnd>
```
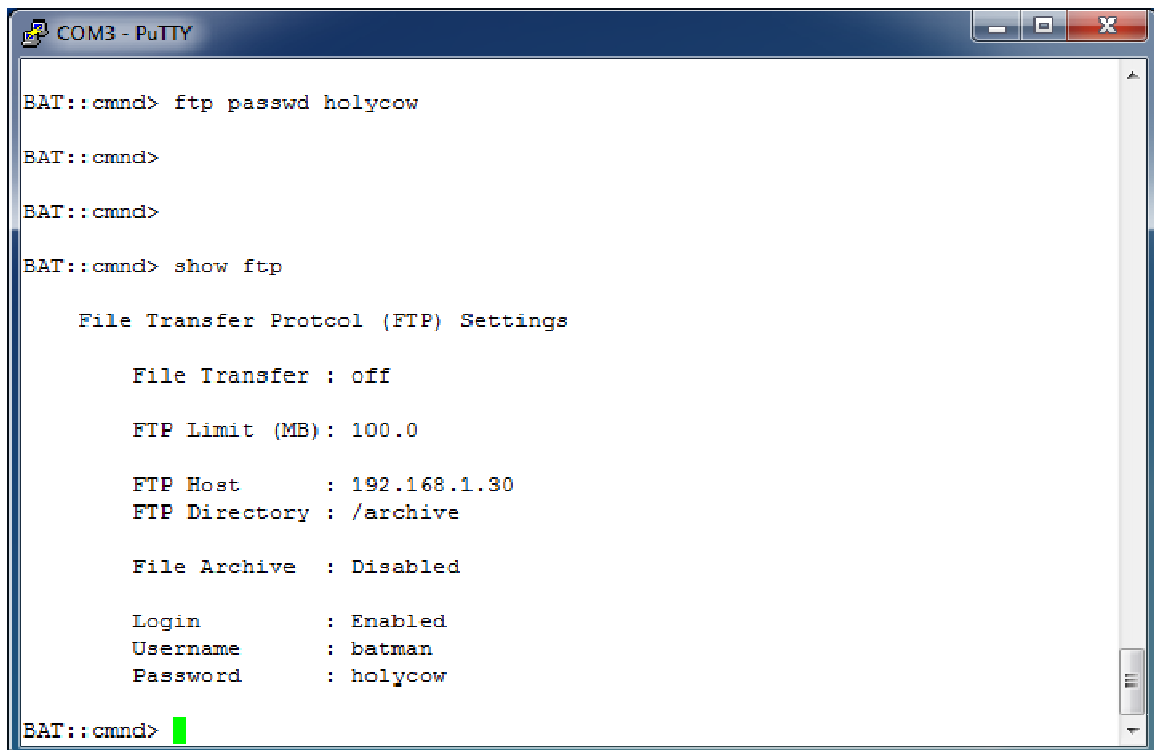
There are four parameters that need to be supplied in order to setup the file transfer program. These are:

1) The internet address of the destination. This can either be a machine name such as ftp.binaryacoustictech.com or an actual IP address such as 122.5.12.10.

2) The target directory on the destination computer. This can be the root directory (".") or any subdirectory such as "/ftp/inbox". Notice that the directory specification uses the UNIX forward-slash notation rather than the windows back-slash notation. To indicate the root or top-level directory use either a dot ('.') or a forward-slash ('/').

3) The username of the account used to access the destination.

4) The password of the account used to access the destination.

To view the current file transfer settings type *show ftp* as illustrated below.

```
COM3 - PuTTY                                                    _ □ X

BAT::cmnd> ftp passwd holycow

BAT::cmnd>

BAT::cmnd>

BAT::cmnd> show ftp

    File Transfer Protcol (FTP) Settings

        File Transfer : off

        FTP Limit (MB): 100.0

        FTP Host      : 192.168.1.30
        FTP Directory : /archive

        File Archive  : Disabled

        Login         : Enabled
        Username      : batman
        Password      : holycow

BAT::cmnd>
```

In addition to the four main parameters, the file transfer capability includes a few options:

1) The file transfer feature supports transferring only the log files or transferring all files.

2) The operator can set a limit on the amount of data that is transferred per night to fit with in the limits of network service plans.

3) The use of the login information, username and password, can be disabled to allow access to "open" ftp sites.

4) The local files can either be deleted from or archived to local storage once they have been transferred. The choice between deleting and archiving local files depends on how long the iFR-IV will be left in the field and how much local storage is provided. Archiving is only recommended for shorter durations or systems with large external disks, because once the storage fills up the iFR-IV will stop recording.

To enable or disable file transfer use:

    ftp mode log - for transferring only log files
    ftp mode all   - for transferring all files

To set the nightly transfer limit:

    ftp limit 100   - This limits the system to 100M bytes

To setup the four ftp parameters use:

    ftp host <add hostname here>
    ftp directory <add directory here>
    ftp user   <username>
    ftp password <password>

To enable archiving use:

    ftp archive 1   - enable archiving

To enable or disable login (username/password) use:

    ftp login 1   - enable login information
    ftp login 0   - disable login information

Special note on debugging file transfer settings

Version 2.3 of the iFR-IV firmware does not report ftp errors to the console screen. The only way to verify that the ftp function is working correctly is to view the iFR-IV log file.

The recommended procedure to test the file transfer feature is to setup the iFR-IV along with an AR125 or a MIC unit and perform a test run. Note: you can trigger snapshots by clapping or jiggling keys in front of the detector.
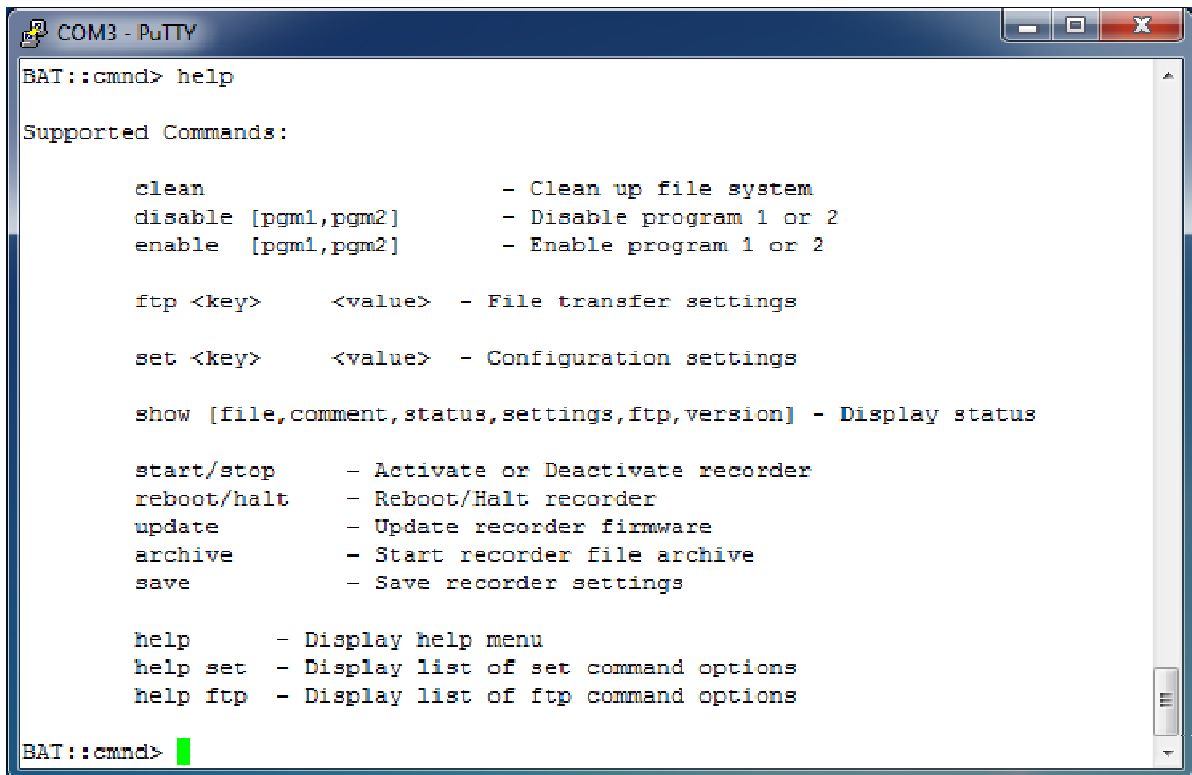
Testing procedure:

    1) Start up the system.
    2) Trigger a few snapshots by clapping or jiggling keys.
    3) Wait about thirty seconds for the transfer to complete.
    4) Disconnect the detector.
    5) Remove the storage device.
    6) Plug the storage device into a windows machine and use Mi-
crosoft word to open the log file. The log files are written as text
(*.txt) files and are located in the **MySnapshots** folder along with the
recordings.
    7) Check the end of the log file to verify that the transfers were
completed successfully. If not the log file will indicate which parame-
ters are in error.
    8) Repeat if necessary until the setup is correct and the log files
indicate that the files where transferred correctly.

Once the file transfer settings are verified they do not need to be en-
tered again.

5.8 : Getting help

To get a complete list of all the commands, type *help* and the following list will be displayed.

```
COM3 - PuTTY
BAT::cmnd> help

Supported Commands:

        clean                     - Clean up file system
        disable [pgm1,pgm2]       - Disable program 1 or 2
        enable  [pgm1,pgm2]       - Enable program 1 or 2

        ftp <key>     <value>  - File transfer settings

        set <key>     <value>  - Configuration settings

        show [file,comment,status,settings,ftp,version] - Display status

        start/stop    - Activate or Deactivate recorder
        reboot/halt   - Reboot/Halt recorder
        update        - Update recorder firmware
        archive       - Start recorder file archive
        save          - Save recorder settings

        help      - Display help menu
        help set  - Display list of set command options
        help ftp  - Display list of ftp command options

BAT::cmnd>
```

5.9 : Stopping and/or rebooting the recorder

To stop the current recording session, type *stop* at the command prompt. To resume recording type *start*.

To terminate the program and reboot the recorder, type *reboot*. To terminate the program and shutdown the recorder, type *halt*.

PLEASE NOTE: when you shutdown the recorder (using *halt*) please wait until the LEDs turn off before disconnecting the disk drives or microphone.

48

6.0 : Using the iFR-IV

Once you have configured the iFR-IV it is ready to be used. All of the configuration settings are saved internally and will be used each time the unit is powered on.

Starting from the power off state, connect the microphone element to the iFR-IV using the supplied microphone cable.

Next connect a storage source to one of the USB connectors using one of the supplied right angle adapter cables. The storage can either be a thumb-drive, a USB enabled compact flash unit, or a Western Digital Passport or similar external hard drive.

Power up the iFR-IV by pressing the power button. Initially both LEDs will light indicating that the unit is booting up. When finished only one LED will remain active. At this point the iFR-IV is ready to record.

To test, clap your hands or jiggle keys near the MIC. You should see the Recording LED flash, indicating that the iFR-IV is recording a snapshot to internal memory.

All snapshots are initially written to a an internal memory card. Every hour, and as it is powered off, the iFR-IV will transfer the snapshots from internal memory over to a specific directory on the external thumbdrive or hard disk. They are written to a time stamped directory that is named similar to the following: **MyArchive_DyyyymmddThhmmss**.

To stop recording and remove the storage device, you must first power down the iFR-IV. This can be performed by holding the power button down for four seconds and releasing it. Wait until both LEDs turn off and then disconnect the storage device.

To access your recordings, plug the hard-disk into a laptop or computer. Once the device mounts, look for the MyArchive directory with the most recent timestamp. All the recordings are in that directory. The file names are time stamped using the following format: <base file name>_DyyyymmddThhmmss.

Happy batting!

7.0 : Updating the iFR-IV software

The iFR-IV includes an automated upgrade feature that will allow you to upgrade the internal software and add new functionally and features as they become available.

We will contact you as upgrades become available. We also added a new page to our website which will allow you to check for the latest software versions.

8.0 : Further Information

For further information or trouble shooting, please contact us or visit our web site.

Web: www.binaryacoustictech.com
E-Mail : info@binaryacoustictech.com

For more information on SonoBat, visit www.sonobat.com.
For more information on WAVPACK, visit www.wavpack.com