

BLACKBOX RECORDER

BBR64MADI &

BBR64Dante

User Manual

V 3.0 rev 1

Date: Nov 2013

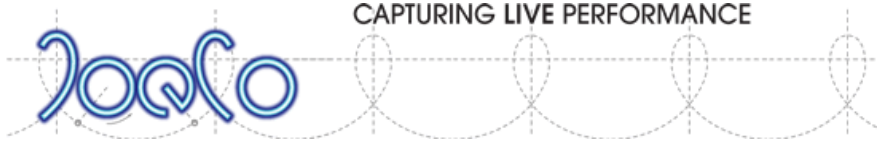
Congratulations on your purchase of the JoeCo BlackBox Recorder. This document will lead you through the basics of how to set up and use the product. The BlackBox Recorder (BBR) has been designed to be as simple as possible to set up and operate. Consequently you will find that this user manual is not a long document and can be read from cover to cover in a short while. However, we strongly recommend that you do read it just in case there are some aspects of the product that are not immediately obvious.

This manual covers the following variants of the BlackBox Recorder: BBR64MADI and BBR64DANTE and should be read in conjunction with the Quick Start guide.

More information is available in the LOGIN area of the JoeCo Website www.joeco.co.uk . Visitors can gain immediate access to more detailed information whilst End Users, once approved, are eligible for software upgrades and other downloads.

If you need information in a hurry, register as a Visitor and upgrade to an End User later on.

© JoeCo Limited 2009 - 2013. E&OE. All rights reserved. All trademarks and names are recognised as the property of their respective owners



Contents

BLACKBOX RECORDER	1
BBR64MADI & BBR64Dante	1
Important Safety Information	3
WARNING - Read the following before proceeding :	3
Copyright Warning	4
Opening the Box.....	5
Box Contents.....	5
Controls and Interfaces	6
Front Panel	6
Rear Panel.....	7
Installation.....	9
Deciding where to install	9
Wiring the BBR into your console	9
Deciding on a disk drive	10
Connecting a disk drive	11
Power connection.....	11
Checking that everything works	12
Normal operation	12
Recording.....	13
Playback.....	14
File Names	15
Virtual Sound Checking	17
Monitoring.....	18
Summary of Combined Controls in MAIN Screen	19
Using the Menu.....	20
Menu Structure and operation	20
Setting up adjustable parameters.....	20
Software updates.....	29
Linking multiple BlackBox Recorders together.....	31
Using a PS2 keyboard	33
Safe'n'Sound Record Recovery.....	34
Troubleshooting	35
Summary Of Alert Messages.....	37
JoeCo Conditions of Use.....	39
Software Licence Agreement	41
Warranty Information	44
Product Returns	47
Product and End User Registration	48



Important Safety Information

WARNING - Read the following before proceeding :

Read instructions: Retain these safety and operating instructions for future reference. Adhere to all warnings printed here and on the equipment. Follow the operating instructions printed in this User Guide.

Do not remove covers: Operate the equipment with its covers correctly fitted. Refer any service work on the equipment to competent authorised technical personnel only.

Power sources: Connect the equipment using the mains power adapter supplied.

Power cord routing: Route power cords so that they are not likely to be walked on, stretched or pinched by items placed upon or against them.

Grounding: Do not defeat the grounding and polarisation means of the power cord adapter or plug. Do not remove or tamper with any ground connection in the power cord.

Water and moisture: To reduce the risk of fire or electric shock do not expose the equipment to rain or moisture or use it in damp or wet conditions. Do not place containers of liquid on it which might spill into any openings.

Ventilation: Do not obstruct any ventilation. If the equipment is to be operated in a flight case ensure that it is constructed to allow adequate ventilation.

Heat and vibration: Do not locate the equipment in a place subject to excessive heat or direct sunlight as this could be a fire hazard. Locate the equipment away from any devices which produce heat or cause excessive vibration.

Servicing: Unplug the power immediately if the unit is exposed to moisture, spilled liquid, the power adapter becomes damaged, during lightening storms, or if smoke, odour or noise is noticed. Refer servicing to qualified technical personnel only.

Installation: Install the equipment in accordance with the instructions printed in this User Guide. Use the equipment connections for their intended purpose only.

Precautions

Environment: Protect from excessive dirt, dust, heat and vibration both when operating and storing. Avoid drinks spillage, tobacco ash, smoke, and exposure to rain and moisture. If the equipment becomes wet, remove power immediately. Allow to dry out thoroughly before using again.

Cleaning: Avoid the use of chemicals, abrasives or solvents. The equipment is best cleaned with a dry lint-free cloth. Do not remove the cover to clean the unit.



Damage: To prevent damage to the equipment cosmetics, avoid placing heavy objects on the unit, scratching the surface with sharp objects, or subjecting the unit to rough handling and vibration.

Transporting: The equipment should be transported in the original packing or purpose built flight case to protect it from damage during transit.

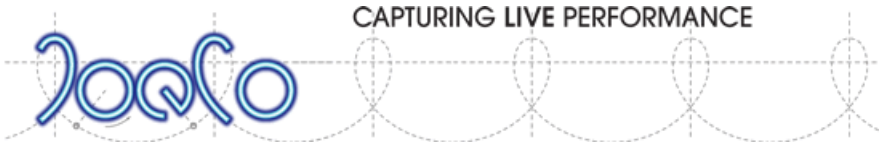
Cables: Plan the location of the equipment so that the connecting cables are not fully extended. Full extension of the cables can stress the equipment and cables and may result in undesired performance. Ensure that all cables are located such that they cannot be stood on or tripped over.

Copyright Warning

JoeCo's recorder products are designed to enable you to record and reproduce material to which you own the copyright, or material which the copyright owner has granted you permission to record and/or reproduce.

It is illegal to record, reproduce, distribute, sell, hire, lend, perform or broadcast all or part of a work (written or musical composition, broadcast, performance or similar) whose copyright is held by a third party without permission of that third party.

Do not use this Product for purposes that could infringe a copyright held by a third party. JoeCo and its authorised distributors and resellers assume no responsibility whatsoever with regard to any infringements of third-party copyrights arising through your use of this Product.



Opening the Box

Box Contents

Inside the box you will find the following:

- BlackBox Recorder
- Power Supply
- User Manual
- Quick Start Guide

The BlackBox Recorder is not a standard multitrack recorder nor is it a digital audio workstation (DAW). It has been designed specifically for Live applications and acquisition and will not necessarily be appropriate for use in a studio situation. It will typically be used to record audio material onto a USB2 drive for subsequent editing and processing in a DAW.

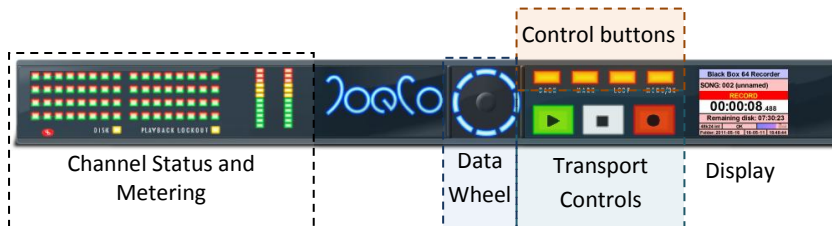
A number of specific features have been added to make it suitable and safe in a Live environment; playback lockout, protection against accidentally ending a recording, virtual sound checking, no general purpose operating system, etc.

Some features often found in other multitrack machines are not present in the BlackBox Recorder such as overdubbing and punch in facilities.

Controls and Interfaces

Front Panel

The front panel of the BlackBox Recorder contains all the user controls for the unit. The buttons are all touch sensitive which prevents them wearing out through constant use – just place the flat of your finger on the button to operate.



The left hand side of the unit contains the metering and channel status section. Each channel or Track [1 through 64] has a bicolor LED to indicate the track status:

- Flashing dim red = armed for recording
- Solid dim red = recording (no level on channel)
- Green > yellow > red > bright red (varying brightness) = level meter
- 1 or 2 adjacent LEDs flashing green = channels in Pre Fade Listen (PFL)

To the right of this are two columns of metering LEDs comprised of Green, Yellow and Red LEDs. These metering LEDs show the levels on the Pre Fade Listen (PFL) bus inside the BlackBox Recorder. The monitoring section of this manual describes the PFL function in more detail.

There are also indicators for Disk activity and Playback Lockout which can prevent you from accidentally entering playback during the performance.

To the right of the JoeCo logo is the control wheel which has a number of functions explained later in this manual.

Then there are the main Transport controls [PLAY, STOP, RECORD] with the four other control buttons above [L-R: BACK, MARK, LOOP, MENU].

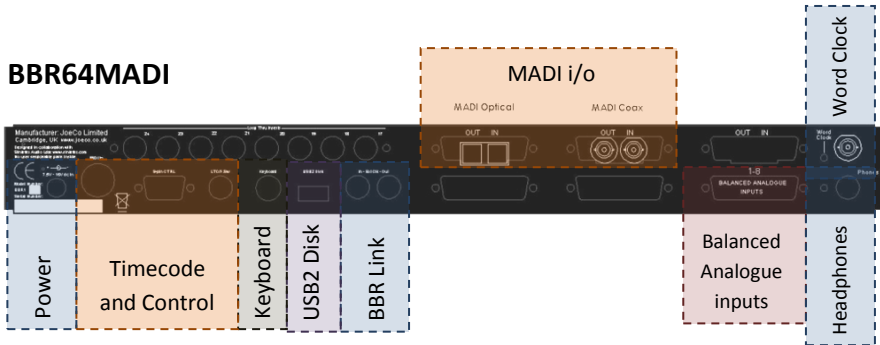
Finally, at the right hand side of the front panel is the colour LCD display. This is the primary user interface and shows the current mode of operation along with settings and any error messages. Most screens are colour coded to more easily see what is happening from a distance.



Rear Panel

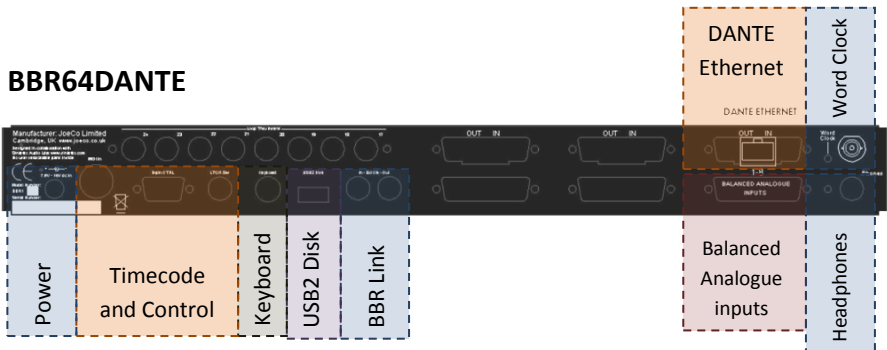
The rear panels of the BBR64MADI and BBR64DANTE BlackBox Recorders are as follows: The areas indicated in the diagram below are explained in more detail later in this manual.

BBR64MADI



Audio i/o on the BBR64MADI utilises either optical (SC connectors – see note below) or coaxial (BNC connectors). These are selectable in software (see above). Audio Clocks may be extracted from the incoming MADI data stream (recommended), from the separate word clock input or from the BBR link RCA input (ext clk in).

BBR64DANTE



Audio i/o on the BBR64DANTE utilises the Ethernet RJ45 connector and should be connected using high quality CAT5E or better Ethernet cable (see above).

Audio Clocks may be extracted from the incoming DANTE data stream (recommended), from the separate word clock input or from the BBR link RCA input (ext clk in).



On both types of BBR64 unit, the rightmost of the lower 3 D-type cut outs provides for an additional 8 channels of balanced analogue input. These can be used to insert 8 channels of, for example, audience mics using a separate mic pre amp and will use 8 of the available 64 channels. The cable loom conforms to the TASCAM standard for analogue i/o (pin out is available in the Visitor section of the Login area of the JoeCo website www.joeco.co.uk).

A stereo TRS ¼" headphone socket provides the output of the Pre Fade Listen bus.

The power connector is a 4pin mini XLR connector, wired: pin 2 = 0V, pin 4 = 12V.

Linear timecode (LTC) can be provided on the tip of the ¼" jack socket; the ring of the same socket is for a momentary contact closure or footswitch. The BlackBox can also accept MIDI Timecode (MTC) and will respond to MIDI Machine Control (MMC) commands. The MIDI input is "open loop" format. The 9-pin socket allows remote control via Sony PII format. A PS2 keyboard socket allows control and text input from a standard PS2 style QWERTY keyboard.

The rest of the rear panel is fairly self explanatory and is explained in greater detail later in this manual. There are more technical details on the JoeCo website (www.joeco.co.uk) should you require them.

NOTE: The MADI SC optical connector is supplied with a rubber bung to prevent the ingress of dirt and dust into the delicate optical interface when not in use. Dirt can abrade the optical surface of the connector and make it unreliable. You are strongly advised to ensure that this bung is reinserted immediately after removing the optical MADI fibres to avoid costly maintenance repairs in future.



Installation

Deciding where to install

In a live situation, it depends on whether the live engineer wants to be able to see the BBR interface or not and whether you intend to utilise the Virtual Sound Check facilities. If possible, it's best to install it at eye level for ease of operating the menus.

Wiring the BBR into your console

When recording MADI, your choice of coaxial or optical SC cables will most likely be dictated by the console. The BBR64MADI provides for both types so it's easy to plug in. Make sure you wire the console's output to the BBR's input and vice versa.

You will need to configure the sample rate to be the same as the rest of your system. Use the MENU button and then use the wheel to select SETUP; Press MENU again to enter the Setup menu and then use the wheel again to select SAMPLE RATE. Pressing MENU again will now allow you to use the wheel to select which sample rate to use and MENU again confirms your choice. The BACK button takes you back a MENU level.

To configure the input to the BlackBox, you will need to use MENU; INPUT/OUTPUT... to select the input source: [Electrical (Coax) or Optical]; select the Reference Clock: [MADI (recommended), Wordclock, SPDIF or Internal].

At the bottom of the INPUT MENU the Input Status bar displays the sample rate and number of channels of input that the BBR is receiving. A green background is shown when the BBR is locking to a good, valid input signal; a yellow bar indicates that the BBR cannot lock to the incoming signal or that it has been instructed to lock to a clock signal that is not synchronous with the incoming data; a red bar shows that no input signal is being received.

The Output Setup screen similarly configures the output of the BlackBox.

If you're using a BBR64DANTE system then you'll have an appropriate CAT5 or better Ethernet cable to plug into the BlackBox Recorder. The CAT5 cable is bidirectional and you'll need to use the Dante Controller software on a computer to configure the network connections for the first time, but after that, each component in the Dante network will remember its configuration and routing table, even after being repowered.



In certain circumstances, you may want to supplement the digital inputs with up to 8 analogue inputs. This is primarily aimed at capturing the ambience of the venue or the audience itself. These additional 8 analogue inputs are balanced line level inputs and will normally be fed from separate microphone pre amps or spare channels on the console.

On a BBR64MADI, these additional 8 analogue inputs are primarily intended to supplement the recording when receiving 56-channel (legacy) MADI signals.

On a BBR64DANTE system these additional 8 analogue channels will also be available and you can decide whether to insert them into the outgoing Dante data stream or not. If you do want to access these channels elsewhere on the Dante network, insert them as channels 1-8, bumping all the other channels up.

The additional analogue inputs can be monitored on the internal PFL bus, two channels at a time

These balanced analogue inputs can be switched between **Low** and **Pro** levels in the Setup Menu (page 25).

Setting	LOW	PRO
Nominal level	-10dBu	+4dBu
Headroom above nominal level	14dB	18dB
0dBFS (when digital clipping will occur)	+4dBu	+22dBu

Pay special attention to the clocking signals to ensure that the BlackBox Recorder is being clocked correctly. There is more on this subject later, in the clocking section (page 23).

Deciding on a disk drive

Both the BlackBox BBR64MADI Recorder and the BBR64DANTE Recorder require modern fast USB2 drives. We cannot guarantee that every drive in the world will work but the ones we've tried so far have done. The only criteria that you need to follow are:

- Up to 2TB with USB2 interface
- 7200rpm recommended
- Formatted with FAT32 Filing System



USB2 can carry up to 480Mbps/s of data and for recording 64 tracks of 48kHz/24bit the maximum data rate we need is around 80MBits/s so there's normally plenty of headroom. JoeCo has already tested numerous USB2 drives from Western Digital, Glyph, Seagate, Verbatim, Samsung, Buffalo, Hitachi, Toshiba, G-tech and others and found them to work well. We chose the FAT32 filing system because it is compatible with all major Operating Systems and it's also the format chosen for the AES31 digital interchange standard.

However, bus-powered drives (such as the Western Digital Passport series) typically draw more current during spin up than the USB2 specification allows (limited to 500mA) and can therefore not be used without providing a separate power supply. Standard Flash RAM drives (aka Pen Drives) are not fast enough to take the full USB2 data rates that the BBR requires, but the fastest ones normally work ok. Larger thumb drives (64GB and larger) are typically much faster and usually work well. Ask the shop if you can try the drive with the BBR before you buy it.

You must make sure that the drive you are using is fast enough and not too fragmented before you use it with the BlackBox Recorder. If in doubt, reformat the drive and make a test recording of an hour or so to be sure. Then reformat the drive again before recording the performance. Drives are very cheap nowadays so we advise keeping a few spares around just in case.

Connecting a disk drive

Plug the disk drive into the USB2 socket on the back of the BlackBox unit and then power up the drive. The drive will be scanned, logged and ready to use in a matter of seconds. If it takes more than 20 seconds to log the drive or the BlackBox reports "WRONG DISK FORMAT", check that the disk is formatted correctly. The BlackBox can be used to reformat the drive to FAT32 (see page 28).

Power connection

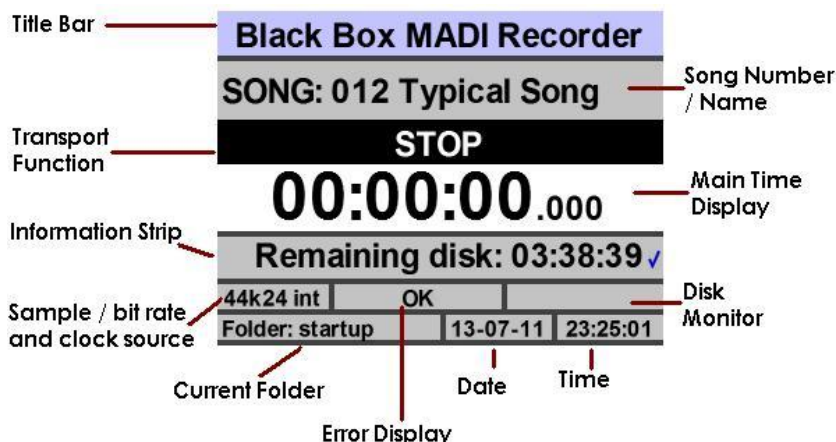
The BlackBox Recorder is supplied with its own power supply which plugs into the dc inlet at the rear right of the unit (or left if you're looking at the rear as you read this). The power connector is a 4pin mini XLR connector, wired: pin 2 = 0V, pin 4 = 12V. Although the unit can accept a suitable dc input between 7.5V and 16V it should always be used with the power supply provided.



Checking that everything works

Once you have powered the unit up, configured the input and output, connected and powered up the disk drive you should be ready to record. Press the RECORD button and away you go!

The basic screen should look something like this when first powered up with a drive attached.

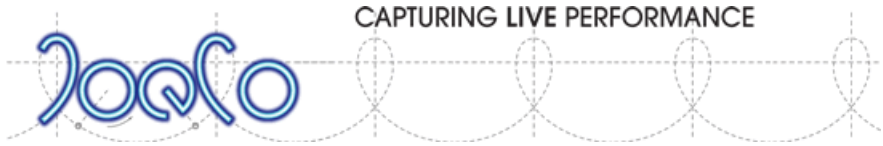


Normal operation

Whenever you power up the BBR it first checks the date against its internal real-time clock. The first time the BBR enters RECORD each day, it creates a folder on the drive named \YYYY-MM-DD.bbr and makes this the current folder (where YYYY is the year, MM is the month and DD is the day). [The real-time clock will have been set up at the factory but you will need to adjust it to your local time – see page 26]

It does this so that all today's recordings will be kept together in one folder. If you happen to be recording a late concert which goes on past midnight, the BBR will not create a new folder until the next time it's powered up so all the songs recorded during a typical concert will still be kept together.

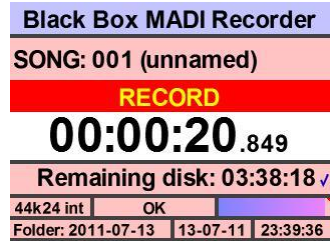
The controls are all touch sensitive. Just place the flat part of your finger firmly on the panel over the control – the area your finger covers is more important than the pressure you apply.



Recording

On power up, the BBR is ready to record within seconds of logging the drive – just press the RECORD button. The button flashes to show that it's creating the files and then turns solid once in record.

Once the unit is recording, the STOP button must be held down for a couple of seconds to end the recording. This is to prevent someone brushing against the controls and accidentally dropping out of record. The STOP button flashes until the BBR has finished closing the files properly.



If you want to mark the end of one Song and the start of another without dropping out of record you can just press the RECORD button again.

You can also set MARKS within a Song by pressing the MARK button which will enable you to create loops easily for Virtual Sound Checking.

At the end of a recording (remember to hold the STOP button down) the BBR will do some housekeeping such as closing the files and writing file headers to the disk to keep it in prime condition. The DISK LED and the STOP button will flash and the file closing status will be displayed on screen until the BBR has finished writing to the disk. Wait until it has finished before starting the next operation.

It's particularly important that the files have been closed before you unplug the USB disk drive. The BlackBox will try to recover files that have not been properly closed (see Safe'n'Sound Record Recovery - page Error! Bookmark not defined.) but there's no guarantee especially if another operating system has written to the disk in the meantime).

There are a few things that might need your attention. The BBR remembers its settings so you should only have to set these things up once.

- You might want to record at a different sample rate or bit depth to that at which the BBR is currently set (page 23)
- The unit may be set up to only record certain tracks and you may want to record on more (or less) tracks (page 21)
- You may want to timestamp the recording against timecode (page 23) or set up the unit to use an external audio clock (page 23)

All these items can be controlled from the menu which is described later in this manual.



Playback

Normally, the last recording made will be immediately available for playback. Just press the PLAY button and it will flash while it loads the files into its memory buffers before entering play.

However the BBR may be set to “PLAYBACK LOCKOUT”, indicated by the LED in the Metering area of the front panel, in which case the play button will have no effect. “PLAYBACK LOCKOUT” is a safety feature that prevents the engineer from accidentally starting to play back recorded material during the middle of the concert! This can cause severe embarrassment and could be a career limiting move for the sound engineer.



If the BBR is set to “PLAYBACK LOCKOUT” and you want to disable it temporarily to perform a Virtual Sound Check, press the MENU button to enter the MENU and PLAYBACK LOCKOUT is the first item on the list. Press MENU again and it will remove the tick (✓) mark against PLAYBACK LOCKOUT. Press BACK to exit the MENU and you can now use Playback normally. PLAYBACK LOCKOUT can be set to manual in the SETUP menu preventing it automatically engaging after each recording.

Fast Wind

FAST FORWARD and REWIND functions within a SONG are achieved by holding the STOP button down whilst moving the data wheel.

Selecting Songs

To select other songs for playback you will need to press the MENU button. Move the data wheel until **Song Select** is highlighted; press MENU again; **Select Song Folder** if required and then move the data wheel to select the song you want to play back; press MENU to confirm.

If you load a Song that was recorded at a different sample rate, a warning will be displayed in the Song Name area of the main screen showing the original sample rate in red.

Next / Previous Song

When the BBR is in STOP, the MARK and LOOP buttons will move you to the previous and next song respectively in the current folder.



Recent Songs

As Songs are played or recorded, they will automatically be placed into the **Recent Songs** list which is located in the **Song Select** menu. This allows you to quickly access the Songs that you regularly play for sound checks etc. The Recent Songs list is stored on the disk itself so the list will change if you use a different disk.

File Names

By default, the BBR will name the audio files it creates as follows:

nnn-tt.WAV

Where **nnn** is the song number (between 001 and 999) and **tt** is the track number (between 01 and 64).

Note: if multiple BBR64 units are being chained together as master and slaves (see page 31) then the machines need more than 99 track numbers. So in master and slave mode the audio files are automatically named:

nnn-ttt.WAV

creating an extra digit for the track number **ttt** to allow up to 999 tracks per song.

The track number is not shown on the main BBR user interface screen. However, the track number does determine which file appears on which output and is therefore vital both for replaying songs and in post production. We will refer to a standalone BBR64 system in the following sections but the same naming logic applies to master/slave systems.

Renaming Songs

If you plug a PS2 QWERTY keyboard into the BBR64 you can rename Songs to help find them later on the BBR64 or in post production on a Digital Audio Workstation (DAW). The keyboard connector is a PS2 style Mini DIN connector. This was chosen specifically to avoid getting it mixed up with the USB connection for the Disk Drive. Most PC shops sell them very cheaply.

To rename a song: use “Ctrl-S” and then type in the name that you want. The BBR will accept capital and lower case letters, spaces and all normal characters that computers will accept in file names except the dash “-” (any illegal characters will be replaced with an underscore “_”). You can navigate backwards and forwards using the left and right arrow keys and the delete and backspace keys operate as you



would expect. Finish by pressing “Enter” on the keyboard. (Escape will cancel any changes). The resulting tracks will be called

nnn-tt.Song Name.WAV

where “**Song Name**” is the new name that you typed. This will rename all the tracks of this song in this folder with this new Song Name. [Note: It is important for the BlackBox to keep the *nnn-tt* prefix so that it knows which audio files belong together as a Song and which track is to be played on each output channel. It also helps some DAWs to place the tracks in their playlist in the correct order / position for playback.]

So for example, if the current song is 001(unnamed) and you decide to name it “Codfish”, you will end up with the following files on your disk

001-01.Codfish.WAV
 001-02. Codfish.WAV
 001-03. Codfish.WAV
 ...
 001-64. Codfish.WAV

Renaming tracks

To rename a track: use “Ctrl+<digit><digit>T” on the keyboard (where <digit><digit> is a number between 01 and 64 for selecting which track you want to name) then type in the name that you want. The BBR will accept the same characters as for Song Names, above. Finish renaming the track by pressing “Enter” on the keyboard (or arrow up/down if you want to immediately name another track). The resulting tracks will be called

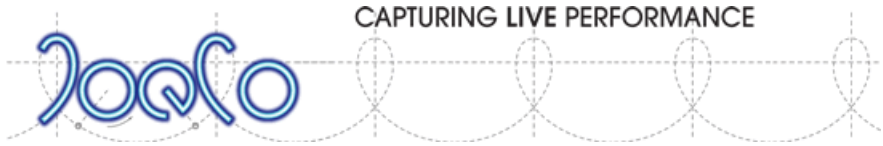
nnn-tt.Song Name-Track Name.WAV

where “**Track Name**” is the new name that you just typed. If you use the arrow down the BBR will automatically move on to the next track so that you can rename it too.

You may want to name all the tracks similarly for every Song that you’re going to record. At most concerts, if the kick drum is plugged into channel 2 then it will remain that way for the whole evening if not the whole tour. To facilitate this, the Track Arm MENU and the Name Manager MENU allow you to load the track names from an existing Song and then use them as a template.

Select the Song which has appropriately named track as if for Playback (see above).

NAME MANAGER	
Track 57:	Guitar3
Track 58:	BVox1
Track 59:	BVox2
Track 60:	BVox3
Track 61:	FOH Left Front
Track 62:	FOH Right Front
Track 63:	FOH Left Rear
Track 64:	FOH Right Rear



Enter the Track Arm MENU or the Name Manager MENU and then select the Track Name Template MENU. Select “Copy names from song” and this will populate all the Track names for you automatically. All Songs that you record subsequently will use these Track names. The Track names will be stored in the Flash memory so you can use them time after time.

So for example, assuming that channel 1 is a bass guitar and channel 2 is a kick drum, you would use “Ctrl-01T” and then type “Bass” before pressing “Down Arrow” and then “Kick”, etc. and you would end up with files named:

001-01.Codfish-Bass.WAV
001-02.Codfish-Kick.WAV
001-03.Codfish-Snare.WAV
...
001-64.Codfish-Daphne Nose Flute mic.WAV

The next Song might contain files named as follows:

002-01.Prawn Vindaloo-Bass.WAV
002-02.Prawn Vindaloo-Kick.WAV
002-03.Prawn Vindaloo-Snare.WAV
...
002-64.Prawn Vindaloo-Daphne Nose Flute mic.WAV

But it would name all the other tracks automatically.

It is completely optional whether you rename Songs or Tracks. The BBR does not require you to do it; it merely helps in post production when they receive a disk with hundreds of WAV files in each folder. The basic naming scheme and time stamping will keep the files well organised anyway.

Virtual Sound Checking

If you are using the BlackBox Recorder for Virtual Sound Checking you may need the ability to Loop around certain sections of the audio, such as a chorus. This is where the MARK and LOOP buttons are primarily used.

MARK and LOOP operations

Pressing the MARK button either during the Recording or during Playback will place Markers in the Song File itself. Multiple Markers can be set within a Song. The Markers are indicated on the Transport Function Bar

Having set some Markers, the LOOP button will create a playback Loop and continually play back the MARKED section of the Song.



If the LOOP button is pressed between Markers, the BlackBox will continue in Playback until it reaches the next Marker, Loop back to the previous Marker and then recommence Playback. There will be a short break in Playback while the BlackBox loops back to the earlier Marker (i.e. it does not create a continuous loop).

If, however, there are no later Markers, pressing the LOOP button will create a Loop between the last Marker and the current playback position.

LOOP mode will remain active until you press LOOP again. You are able to STOP and restart PLAY whilst remaining in LOOP mode.

In STOP, holding down MARK and using the data wheel will jump to the next and subsequent Markers within the Song so that you can start Playback from a specific Marker.

In PLAYBACK, holding down the MARK button while using the data wheel enables the deletion of Markers that are no longer required in the current Song. Clockwise movement will delete one, or more, later Markers; Anticlockwise will delete one, or more, earlier markers.

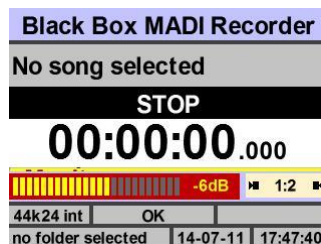
The Markers are stored in the audio files in what's known as a Cue Chunk which many (but not all) DAWs can read. So they may also be used to indicate a place in the recording to the post production team.

Monitoring

It is possible to monitor a summing mix, a rough mix, or individual tracks or pairs of tracks on the BBR via the headphone output. The summing mix "ALL" will place every odd numbered track on the left channel and every even numbered track on the right channel.

The data wheel will alter the volume of the headphone output (when not in the MENU). The volume is displayed on the colour display while you adjust it.

If you hold down the BACK button whilst using the data wheel, you will change what is heard in the headphones. The options are "MIX"; "ALL"; "1-2"; "3-4", etc. with ALL



being the summing mix mentioned above and the individual track pairs being a pre-fade listen of each pair of tracks (panned hard left and right). The **Monitor...** section of the menu controls the level and pan settings in the MIX mode.

The **Monitor** Menu allows you to set the BACK button to toggle the data wheel function between selecting the PFL / solo channel and controlling the headphone volume. In this mode, the MARK button will cancel PFL and return to the MIX setting allowing you to quickly switch back to a full rough mix when you need to. The MARK and BACK buttons flash while the data wheel is used to indicate this mode.

The **Monitor** Menu also allows you to elect to solo individual channels in mono, rather than pairs in stereo. It is also where you set the peak hold time. You can select the Hi-res metering mode where the Track Arm LEDs on the meter display will show the level on the channel(s) that are being soloed.

The headphone output is routed through an automatic gain control so that quiet signals can be as easily heard during the concert as louder ones. This does not affect the recording at all. The amount of automatic gain in the headphone signal chain is adjustable in the Monitor Menu (up to 40dB of gain) and the current gain added is indicated by yellow dots on the gain display.

Summary of Combined Controls in MAIN Screen

Transport Mode	Press/ <i>Hold</i>	Wheel	Function
Any	-	< or >	Headphone volume / PFL channel
Any	<i>BACK</i>	< or >	Swap wheel function between headphone volume and PFL channel
In STOP	<i>STOP</i>	< or >	Fast rewind or Fast forward wind
In STOP	<i>MARK</i>	< or >	Select MARKER for PLAY position
In STOP	MARK	-	Select Previous Song
In STOP	LOOP	-	Select Next Song
In PLAY	<i>MARK</i>	<	DELETE previous MARKER(s)
In PLAY	<i>MARK</i>	>	DELETE subsequent MARKER(s)
In PLAY	LOOP	-	Enter LOOP mode at next MARKER or immediately if no subsequent MARKERS
In PLAY/RECORD	MARK	-	Set a MARKER at current time
In RECORD	RECORD	-	Mark the start of a new SONG

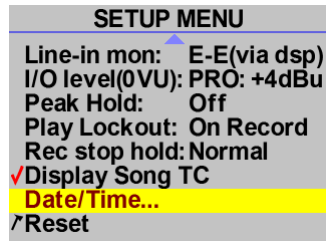
Using the Menu

The following section discusses the menu in more detail. Throughout the menu operations the MENU button moves forward through the structure and also acts as a CONFIRM button; the BACK button moves backwards through the menu structure and can act as an ESCAPE button. The data wheel acts as a selector and data entry wheel whilst in the menu structure. The MARK and LOOP buttons also replicate the wheel to advance down or retreat up the menus, selecting the next or previous menu item.

Once you have adjusted and confirmed the setting or parameter that you want to change, use the BACK button to exit the menu and get back to the normal main screen display. On the whole it's pretty obvious so try it.

Menu items are of 4 types

- **Submenu:** These are shown by an ellipsis after the name, e.g. "Date/Time...". When you press MENU the BBR loads the submenu.
- **Multiple choice:** These show a colon after the option title, e.g. "Line-in mon: E-E(via DSP)". When you press MENU the option turns red and you can scroll through the available options and press MENU again when you have made your choice.
- **Tick box:** These are preceded by a tick or check mark (✓) if selected or an empty tick box if not selected. e.g. "Display Song TC" Press MENU to toggle the option.
- **Action:** These are preceded by a hatchet or tomahawk symbol. When you press MENU the BBR executes the option indicated, e.g. "➤ Reset". Where appropriate the BBR will show a "buried hatchet" symbol in red after execution.



Menu Structure and operation

To enter the menu, press the MENU button in the Control section of the front panel.

Setting up adjustable parameters

This list may not be exhaustive as JoeCo is constantly improving its products and may have added features to the software since this document was authored. However,



this will give you a good idea of the basics and you can always get the most up to date information from the website.

The currently selected Menu item is highlighted in Yellow.

When a Menu item to be adjusted is selected, the display changes to yellow text on a red background. You can then use the control wheel to change the setting before confirming with the MENU button or rejecting your

changes with the BACK button. Some real-time functions cannot be rejected with the BACK button.

Unavailable items are “greyed out” in light red text.



Playback Lockout

Playback Lockout has two settings, on & off, indicated by a tick (✓) beside the option in the MENU and the LED in the Meter area. In the Setup menu you can decide to control Playback Lockout manually or set it to be asserted automatically whenever you enter record as a safety measure.

Track Arm...

Arm All: Arms (enables recording on) all tracks.

Disarm All: Disarms (disables recording on) all tracks.

Arm ticked: Arms the tracks (listed below) that have a tick “✓” (sometimes called a “check mark”) beside them.

1...64: the tracks which can be ticked or unticked using the MENU button and then Armed using the **Arm Ticked** menu item above. Track names (if used) are displayed here also. (See **Renaming Tracks** on page 16)

Clear all track names: this clears all the displayed track names – subsequent recordings will not use track names (unless you rename them)

Copy names from song: this loads the track names from the current song into the track display. Subsequent recordings will use these track names.

Edit song updates template: when ticked the track names will be appended to any song when you edit its name.

Song Select...

This loads the Song Select Menu allowing you to select Songs for playback. The options are:



Recent Songs...

Provides a list of the most recently played Songs – useful if you’re on tour and want to use the same songs in each venue for sound checking

Select Song Folder...

Allows you to navigate to a particular folder. This automatically loads...

Select Song...

Allows you to choose a Song from within the selected Folder.

Input/Output...

This menu item allows you to set up the audio input and output and determine how the BlackBox should clock the incoming data stream. **MADI In:** is selectable between Electrical (Coax BNC) and Optical (SC) connectors. The **Reference Clock:** (see below) should ideally be extracted from the incoming “MADI” data stream (or “Dante” on a BBR64DANTE system). If absolutely necessary the clock can be provided via a “wordclock” BNC signal but this is no longer recommended practice. If the BBR is to be the clock master for the whole system then set the ref clock to “Int”.

Once these two items are correctly selected, the **input status bar** displays what signal is being received and whether there are errors or clock slippage. The input status display is also echoed at the top of the main screen if an error or any digital slippage occurs. Any clock errors are noted in the error display area of the main screen. The Clock Error Display can be cleared using the STOP button. The information area of the main screen will indicate when the Reference clock is missing or when a digital signal slip occurs.



Analogue: Normally set to “Off”, it can either insert or replace any 8 of the digital channels in the MADI data stream. This will normally only be used if you are using a console with Legacy (56 channel) MADI and want to use separate mic pre amps to capture the audience or ambience of the venue without taking it through the console

Output Setup... allows you to control whether the **output format** is Legacy (56 channel) or full MADI-X (64 channel). You can also set up the **wordclock** BNC connector to output a wordclock rather than be an input. It is also possible to have a separate **reference clock** for the output MADI stream and this too is set here.

Setup...

This section contains the most frequently adjusted parameters.

Reference Clock

This very important item determines where the digital sample clock is derived from. The options include extracting the clock from the **MADI** or **DANTE** input; using the external **word clock** BNC connector; less often, the **S/PDIF** external clock from the RCA (Phono) socket on the rear panel or clocking the whole system from the **internal** reference oscillator when the BBR is the clock master for everything.

SETUP MENU	
Ref clock:	Internal
Timestamp:	real time
Sample Rate:	44.1kHz
Wordsize:	24-bit
Monitor AGC:	0dB
Line-in mon:	Relay (thru)
Date/Time...	
I/O level(0VU):	LOW: -10dB

It is very important that you understand why digital clocking is important, if you don't know already, especially if the concert is being filmed or videoed at the same time. Please spend some time talking to people further down the post production process to find out what they would like or recommend, or consult our FAQs on the JoeCo website.

Timeline

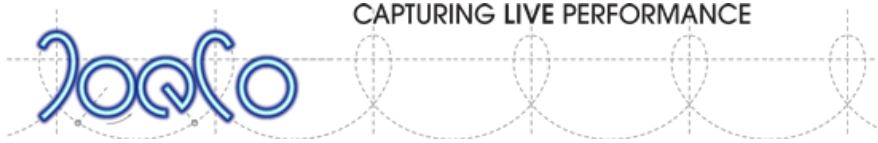
Broadcast WAV files include a timecode stamp which marks the time of the first sample of the file and helps re-sync the files in the post production process. This can be derived from a source of Linear Timecode (**LTC**) or MIDI timecode (**MTC**) or from the **real-time** clock built into the BBR. The LTC input is unbalanced on the tip of a ¼" TRS jack.

The BBR can only read timecode (i.e. act as a timecode Slave) it cannot generate timecode (i.e. act as a timecode Master). The BlackBox does not chase timecode or lock to it; it stamps the first sample in each file with the timecode and extrapolates from there.

Sample rates

Selectable between **44.1kHz**, **48kHz**, **88.2kHz** and **96kHz**. At the double sample rate speeds, the track count is divided by two turning both the MADI and DANTE recorders into 32 track machines

SETUP MENU	
Ref clock:	Wordclock
Timeline:	Realtime
Sample Rate:	48kHz
Wordsize:	24-bit
Control...	
Line-in mon:	MADI thru
Analogue in:	LOW: -10dB
Peak Hold:	Off



Wordsize:

24bit or 16bit. Choose 24bit unless you're really short on disk space or have been instructed that post production must have 16bit files.

Control...

The BlackBox Recorder can accept commands from an external control device such as a console, hardware controller or the

JoeCoRemote iPad app.

Remote Mode:

The BBR can respond to open loop MIDI Machine Control (**MIDI MMC**) protocol commands for transport controls and track arming/disarming.

Note though that the BBR has no MIDI return

path (open loop) and so cannot acknowledge the receipt of a MIDI command or

return the song time to the controller. The BBR can also respond to **Sony 9-pin**

Machine Control (also known as SONY PII) protocol commands for transport controls and track arming/disarming. This is also where you select to interface with the

JoeCoRemote Hardware interface for controlling the BBR from the JoeCoRemote iPad app (either using **WiFi Control** or as a **Wired Pad**).

CONTROL MENU	
Remote Mode: None	
✓ Local Control	
Footswitch:	Off
Link Mode:	None
Link Preroll:	default
Slave Format:	1 - 64
TC Format:	25 fps
TC Trim:	0 bits

Local Control is used to disable the front panel when remotely controlling the BBR.

Footswitch: The ring of the LTC/F.sw TRS jack socket can accept a momentary footswitch. The software can use the footswitch to press **RECORD** (starting a recording or a new song); Insert a **MARK**; toggling between **RECORD/STOP**; or toggling between **PLAY/STOP**. If you need to use this facility with LTC timecode you'll need to make up a special cable, but if you're just using a standard TS jack footswitch you can just push the jack in half way or get an adapter cable from your supplier.

Link Mode, Link Preroll and Slave Tracks:

Used for linking multiple BlackBox Recorders together: see section later in this manual on page 31.

TC Format allows you to set the timecode frame rate. The BlackBox will then flash the timecode display (bottom right of main screen) if the incoming timecode is at a different rate to that which you have chosen.

TC Trim allows for very fine adjustment in "timecode bits" of the offset between the incoming timecode and the internal time. Usually only relevant in post production



TC format follows input. This setting sets the internal timecode frame rate to match the incoming timecode. Please note that this can cause problems later in post production if your source of timecode is intermittent and happens to start at the same time as a recording. **It's always better to set the timecode frame rate explicitly.**

TC Rejam after record “jam-syncs” the timecode reader a second or so after a recording starts and then calculates and timestamps the files accordingly. This is useful when you do not have a continuous source of timecode or timecode starts at the same time as you want to start the recording.

TC rejam after split “jam-syncs” the reader after every time you split a recording with the REC button.

TC start starts record automatically starts a recording when the BlackBox sees incoming timecode. ***TC restart splits record*** will start a new song when there is a discontinuity in the received timecode. ***TC stop stops record*** will end a recording when there is a break in the timecode.

MIDI Setup is used to set up the MIDI control input. More details are available in the Visitor area of the JoeCo website

WiFi setup is used to configure the WiFi operation with the JoeCoRemote. More details are available on the JoeCo website

Line-In Mon:

This adjusts how the unit monitors the Line-In signals on all channels. The options are: **E-E (via DSP)** where signals are routed all the way through the system, **MADI thru** where the input is echoed to the output at the source, and **Off** where the input audio is turned off (most useful for playback only applications).

i/o level (0VU):

Only relevant to Analogue i/o. The two settings are **LOW** and **PRO** as described earlier in this document (Page 9).

Peak hold

This determines how long a peak level will be displayed on the Meters. During the setup and sound checking it is probably worth setting it to “forever” so that you can easily tell if any of the mic amps are overloading and back them off accordingly. During the concert itself, you can set them back to whatever you find most helpful as it's probably too late to adjust the mic amps down at this stage. Digital distortion is



not pleasant to listen to and will probably render your recording useless. You may not notice it live but you will hear it on the recording. Please leave yourself enough headroom when you're recording a concert. If you've set the level correctly, the red meters should flash infrequently if at all.

Playback Lockout

You can set playback lockout to be automatically asserted after you've made a recording, or to be controlled manually. See Playback Lockout section on page 21.

Rec stop hold:

Normal requires you to hold the stop button down for a second or so to end a recording; **Extend (10s)** requires you to hold the stop button down for 10 seconds to end a recording. Specifically added for the more paranoid users.

Display Song TC on Play

This setting changes the main on-screen time display. When ticked, the main display shows the incoming timecode or the timecode embedded in the playback file, rather than the length of the recording or where the BBR is in the Playback of this file. It is most useful when working with Timecode

Adjusting the real-time clock

The real-time clock is used to create folders on the drive with a logical name so that you can find your recording again later. It's also used to timestamp your recordings when no other reference (such as Linear Time Code) is available, so it's a good idea to make sure that the clock is set correctly.

Select **Date/Time** from the **Setup** menu. Select which field you want to adjust. Press MENU to edit the field with the data wheel and then Menu again to confirm and the BBR moves onto the next field automatically. Press BACK when finished.

Reset

Resets the BlackBox back to its factory state – useful if you've forgotten what parameters you've changed.

Monitor...

Monitor AGC sets up the automatic gain control on the headphone monitor outputs, helping you to hear what's going onto disk in a noisy live environment.

Solo in: Affects whether the PFL bus for metering and headphones is working in mono (1 channel) or stereo (2 channels).



Peak Hold duplicates the same adjustment in the setup menu.

Monitor Mix... and **Monitor Pan...** allow the settings of the internal levels and pan positions on the internal mixer. It is also possible to control the internal mixer using MIDI commands – see the Visitor section of the JoeCo website for more information.

BACK: This affects how you use the PFL bus. There are two settings: in **toggles level/select** the operation of the data wheel can be toggled between selecting the PFL channel and the headphone volume by pressing the BACK button when on the main screen; in **Hold for channel select** you have to hold the BACK button down whilst using the data wheel to select different channels onto the PFL bus. The latter mode is mainly for legacy users of BlackBox Recorders.

Name Manage...

The Name Manager menu allows you to set up the optional naming conventions that you want to use. Naming songs and tracks is not mandatory but it can help a lot during the post production process. It is possible to name songs and tracks using the menu buttons and data wheel but you'll find it much quicker using a standard 102 key PS2 keyboard. The “^” character in the following list indicates a keyboard “hotkey” - holding the Ctrl key on a keyboard whilst pressing the following letter will allow you to change that field. Most hotkeys can be used during a Recording.

Next (^p): will **p**rename the next Song that you record

Reuse next songname will use the same song name for each subsequent recording

Folder (^f): Displays the current folder's name and allows you to rename it. NOTE: remember that the BlackBox will always record into a folder named with today's date so if you rename today's folder before you've finished recording all subsequent recordings will be made into a new folder named with today's date.

Song (^s): This displays and allows you to name the current song.

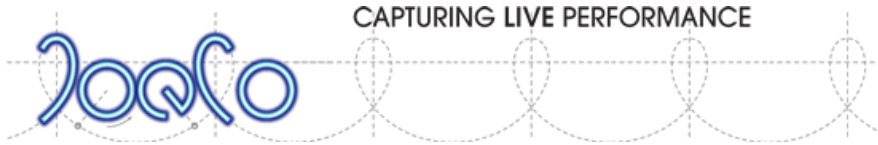
Use track names on rec enables the template function so that each track name will be taken from the template.

Track Name Template... loads the template menu

Clear template removes all the template names

Copy names from song copies any track names in the current song into the template

Track 1...Track 64. These are the template names for each track



Track Names in Song... this allows you to modify the track names for the current song without affecting the template

edit also updates template ... When ticked, using ^t on a QWERTY keyboard will update both the current song and the template

Disk Manage...

This allows you to set up certain parameters regarding how you use the disk. It also allows you to format a USB2 disk drive for use with the BlackBox Recorder and with any Mac or PC based workstation.

Maximum File Size:

Certain popular Digital Audio Workstations are a little fussy about playing back very long files. For this reason the BBR can automatically split very long recordings into files whose maximum length is 1GByte, 2GByte or 4GByte. Check with the post production facility that's most likely to be using the files that you record, to find out what their equipment is capable of accepting. If you don't know, the 2G file size is the best compromise.

Volume: / Disk Partitions:

Very large disks are sometimes "partitioned" into multiple drives. If you were to plug a partitioned drive into Windows, for example, it would look as though you had plugged in two or more drives at the same time and might appear within Windows Explorer as drive E:, drive F: and drive G:. This part of the BBR interface allows you to select which partition to use. The BBR does not accept drives larger than 2TB

Format...:

This option allows you to format a USB2 drive, ready for use with the BlackBox Recorder, which will also be compatible with any Mac or PC based Digital Audio Workstation. When you enter this part of the menu, you will first have to **Select** the partition that you want to format: The BBR defaults to partition "none" as a safety measure to prevent accidental formatting of a drive.

Having selected the partition, the BBR displays the current status of that partition. You can then move onto Format Partition to actually format the drive. Again, there are warning messages to try and prevent accidents.

The final option in the menu allows you to partition the drive into one or more usable partitions. This subject is covered in much greater detail in the FAQ section of the JoeCo website www.joeco.co.uk/main/faqs



Write Protect Disk:

This allows you to stop the BlackBox MADI or DANTE Recorder writing any data to the disk at all. It will not prevent other computers overwriting the disk if you plug the drive into them. It is mainly used for Playback applications.

Software updates

It should be noted that JoeCo may release software upgrades from time to time, either to add features or to cure bugs that have been found in the software – though we have endeavoured to remove all that we’ve found.

Therefore, this document may be superseded in the future as other items are added to the menu structure. We will note any significant changes in the on-line version of the User Manual which will be found in the visitor area of JoeCo website. Go to www.ioeco.co.uk and use Log In to register

The software version currently installed into the BBR is displayed on the LCD display during the boot procedure and can also be seen in the “About” Menu. (N.B. In the event of reporting any suspected problems you will need to give the whole system serial number and the entire 2nd line of the About Menu as this contains both software and hardware version information.)

To load a new software update into the BBR:

Note your current version and ideally ensure that you have a copy in case the update process fails for any reason. It is never a good idea to upload a new piece of software immediately before an important recording – please give yourself enough time to fully test that the software works to your satisfaction before you need to use it in anger.

Ensure that you have a stable source of power during the update process – we have endeavoured to make the update process safe if the power fails during an update, but there is always the possibility that something could go wrong, requiring a return to the factory for a chargeable repair.

Download the new update file from the End User area of JoeCo website directly into the root folder of a FAT32 USB2 hard drive or a FAT32 formatted memory stick (note memory sticks or Pen drives are often formatted with FAT16 which will not work). The file must be called “update64.bbr” or “update64 vxxxxxx.bbr” (where xxxxxx indicates the version number) and it must be placed in the Root folder of the disk.



Note some web browsers append numbers after the file name if you download the same file more than once and these will not work until renamed as above.

In the Update menu, set the BBR to **Permit: Upgrade Only** and then plug the drive (or memory stick) into the USB2 socket.

The BBR will notice the presence of the update file when it logs the drive and ask you whether you want to upload it. Select “Yes” by pressing the MENU button or “No” by pressing the BACK button.

Having uploaded the new file the BBR will automatically reboot into the new software version. Connect your main disk drive and you’re ready to use the new software.

The BBR should then be set back to **Permit: No updates** in the update menu after you’ve loaded the new software to avoid checking for updates on future boot ups.

The other setting in the update menu allows you reload an old version of the software just in case you need to downgrade back to a previous version whose features you’re already familiar with.

Manage Updates:

This option should only be used with great caution and is not for the faint hearted. It allows you to completely remove a field update that you have already installed, reverting to the original factory version, or to replace the original factory version with a field update. The only reason for replacing the original factory version with a field update is to speed up the boot time – typically a field update will add about 10 seconds to the boot time of a BBR which still makes it about 10 times faster to boot than a normal computer.

IF ANYTHING GOES WRONG OR THE POWER FAILS DURING THIS PROCESS YOUR BBR WILL HAVE TO BE RETURNED TO THE FACTORY TO BE RECONFIGURED AT YOUR COST – REPAIRING UNITS THAT HAVE FAILED DURING THIS PROCESS IS SPECIFICALLY EXCLUDED FROM ANY WARRANTY.

Licence...

This allows you to license certain chargeable options, more details of which are available on the JoeCo website. You will need to advise JoeCo of the **machine key** along with your payment details before JoeCo can enable any optional software. You will then receive a non-transferable enabling code for your BlackBox which can be entered into the unit using the **Enter key:** feature

Linking multiple BlackBox Recorders together

It is possible to link multiple BlackBox MADI or DANTE Recorders together to make recordings with more than 64 channels, or to make redundant copies by duplicating the signal path completely. Each BlackBox Recorder will still require its own USB2 disk drive as only 64 channels of data will be recorded to each drive.

As stated earlier in this manual, ensuring that the units are synchronised with both the clocking and starting sample of each recording being locked together is vital for being able to replay the material later in a DAW environment. However, in a BBR64MADI system it is vital that the audio data is properly recovered from the incoming data stream. You will therefore want to use MADI or DANTE as your reference clock.

The BBR will then use the S/PDIF link (labelled “**Ext Clk**” on the RCA sockets on the rear panel) to pass control data and timecode information between the master unit and the slave(s). The Master unit embeds this control data and timecode into the sub-code of the SPDIF data stream. In this mode the digital audio clock signal between units is ignored. The Slave units can either be daisy chained together from the Master unit, or preferably be fed their clocking and control signals from a distribution amplifier. You will need short RCA (phono) jumper cables to connect each subsequent unit.

Using an AES/EBU Distribution Amplifier

Master Ext Clk Out	feeds	Distribution Amplifier input
Distribution Amplifier	feeds	Ext Clk In on all slave units

Daisy Chaining Units

Master Ext Clk Out	feeds	Slave1 Ext Clk In
Slave1 Ext Clk Out	feeds	Slave2 Ext Clk In
Slave2 Ext Clk Out	feeds	Slave3 Ext Clk In
Slave3 Ext Clk Out	not used.	

In the SETUP; CONTROL menu, select **Link Mode**. Select **Master** for the recorder you want to act as the master controller (which will always record channels 1-64). The Slave units should be set to **Slave**. When linking machines, you can easily exceed the two digit track numbering scheme so the BBR64MADI and BBRDANTE systems automatically adopt a three digit track number scheme when switched into master /



slave mode. The track numbers for each slave unit can be set using the **Slave Tracks:** menu item.

The slave units automatically take their transport control signals from the link connection and will lock out the transport controls on all but the master unit. Slave units also dim their screen displays to make it obvious that they are being controlled remotely.

(The link signal between Master and Slave units is proprietary and does not conform to the SPDIF protocol)

You then operate the Transport Controls of all the linked BBRs from the Master unit. Please note though that the headphone monitoring for each unit will still appear only on the unit that is recording those signals, so you will have to either use multiple headphones or swap them from one unit to the next if you need to monitor the higher numbered channels on the Slave systems.

Master/Slave Recording

Any slave units will go into record as soon as their respective disk is ready, so they may not start together and their time displays may not appear to be perfectly in sync. However, all the files recorded will have a sample accurate timestamp and so will be in sync when imported and “spotted to timecode” into a DAW.

Master/Slave Playback

In order to play back synchronously, each machine must have its **pre roll** time set to ensure that the disk files can all be ready in time. The default time will normally be ok but this can be adjusted in the Control section of the Menu (see page 24). The tracks from each unit may not necessarily start simultaneously but they will be in sync when their audio starts. If the pre roll time is too short you will see a message on one or more of the machines saying **PRE ROLL MISSED**.

If you are using the BBR for Virtual Sound Checking you will want to set Playback Lockout on the Slave units to Manual.

Using a PS2 keyboard

The BlackBox Recorder can accept a standard 102 key PS2 style keyboard. Most mini keyboards are not currently supported, especially those that require some setup drivers to be installed on the PC. The most consistently reliable keyboards we have found are the Microsoft 500 style PS2 keyboards which can be obtained in most countries for around US\$10 (£6). Some USB keyboards will work with USB to PS2 converters but not all.

In the following document the ^ character is used to indicate holding the Ctrl key down whilst pressing the key i.e. ^s = Ctrl-s

Direct edit from keyboard (various keys combined with ctrl key)

When not editing we implement various control keys to enter text edit directly (without using menus).

^S	edit current song name
^nnT	edit track name for track “nn”
^P	prename the next song before recording it
^F	rename current folder

Keyboard controls during text edit

^C	Cut
^A	select all
^V	Paste
L / R arrow ←/ →	move cursor left or right along line of text
Up / down arrow ↑ / ↓	in single line edits where there is a natural prev /next no (e.g. track, ixml note), accept current edit and move to prev / next
Return / Enter ↵	complete and accept edit
Esc	abandon edit, no change to text
NB. the return / Enter ↵ key is the character key not the keypad enter; the ←→↑↓ cursor arrow keys are the dedicated cursor keys, not the keypad keys	



Keyboard transport controls

These are the numeric keypad keys (not the character keys)

Enter	PLAY
Del/.	STOP
Ins/0	STOP AND RETURN TO ZERO
*	RECORD
+	MOVE TO NEXT CUE POINT
-	MOVE TO PREVIOUS CUE POINT

Keyboard navigation

These are the cursor keys (not keypad)

Right arrow → or Enter ↵	Same effect as pressing MENU
Left arrow ← or Esc	Same effect as pressing BACK
If menu is open but no field selected	
Down arrow	move to next item in list (like clockwise wheel turn)
Up arrow	move to previous item in list (like anticlockwise wheel turn)
If menu is open and field is selected	
Down arrow	increment option (like clockwise wheel turn)
Up arrow	decrement option (like anticlockwise wheel turn)

Safe'n'Sound Record Recovery

The BlackBox Recorder software includes **Safe'n'Sound Record Recovery**. This software feature endeavours to protect your recording against every eventuality such that even if the drive is unplugged, or the power is removed from the drive or the BlackBox during a recording, Safe'n'Sound will try and recover the files as soon as the drive is plugged back into a BlackBox Recorder.

NOTE: Safe'n'Sound is an automatic process and cannot be invoked by the user. It will only be run if it finds a problem with the disk when logging the drive.

Whenever a disk drive is plugged into the BlackBox Recorder, the disk's filing structure is checked and if any audio files are found to not have been closed



properly, Safe'n'Sound repairs them automatically, leaving all the files accessible by normal workstations.

A note on Spotlight: It is worth noting that some indexing programs on standard computers, particularly **Spotlight** on Mac OS, rewrite the File Allocation Table to make the disk easier for a Mac to index. If you think that there might be a problem with the disk, give the BlackBox a chance to repair the files **BEFORE** Spotlight destroys them. Alternatively, disable Spotlight completely on the Mac before plugging the drive in.

Whilst Safe'n'Sound cannot protect against a physical hard drive failure (which is very rare nowadays), it helps protect against human error or power failure.

As a background task the BlackBox Recorder also scans the disk to calculate the remaining disk space and to find where the first free space is located on the disk. When it has found this information and correctly updated the drive it places a tick (check mark) beside the remaining disk time.

Troubleshooting

We are confident that the BlackBox Recorder will give you long and reliable performance, but in case you have difficulties, here are a few things to try before you call your dealer or distributor.

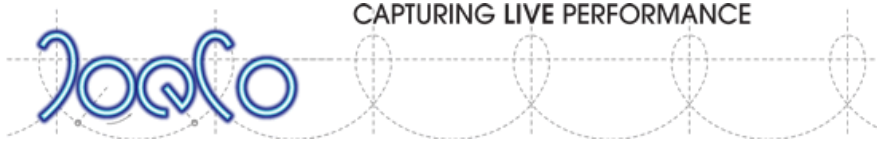
Problem	Things to try
No lights on BBR unit	• Check that the power supply is getting mains power and that the correct power supply is plugged correctly into the BBR • If you have access to a volt meter, check that the power supply is producing at least 9V.
No display on LCD screen	• Check power supply as above • Reboot (turn power off, wait 10 seconds and turn power back on again)
BBR not responding to controls	• Check if disk activity light is operating continuously for more than a few seconds. This may indicate a disk problem. Try power cycling BBR and Disk drive. Check disk for errors as soon as possible on a PC or Mac

Problem	Things to try
BBR boots ok but does not log / find disk	• Check that the USB connector is plugged in correctly to both the BBR and the disk drive • Check disk drive power supply as above • Try a different USB2 lead • Try powering up the BBR without a drive attached and then plugging the drive in afterwards • Check that the disk drive is formatted with a FAT32 filing system and the BBR is not displaying WRONG DISK FORMAT
BBR will not enter RECORD	• Is the disk full? Check the time remaining display
BBR will not enter PLAY	• Check if the BBR is set to PLAYBACK LOCKOUT? • Do you have a song selected? • Maybe there is nothing recorded as yet on this disk or no recordings in the current folder?
BBR sounds ok but no movement on meters	• Check that channels are record enabled • Check that levels from console are reasonably high (> -40bDu)
Some channels not audible	• Check the cables feeding audio into the BBR • Are some channels not record enabled?
Sound through BBR distorted	• Try different cables • Try clocking from a different source
BBR sounds ok during record but is distorted in playback	• Try another recording from a previous concert and see if this is also distorted
Cannot locate previous night's recording	• Are you using a different disk drive from last night? • Are you looking in the right folder? • Can you check the drive in a normal laptop to locate the previous night's folder?
Power removed before BBR has finished writing to disk	• It is often possible to recover files even when the BBR has been powered down whilst still writing to its disk. (See Disk Recovery page 34)

If the above list does not solve the problem you are having, please contact your dealer in the first instance and then your local distributor to help you resolve the issues.

Summary Of Alert Messages

"Hold STOP button to stop"	displayed when STOP is pressed
"PLAYBACK LOCKED OUT"	can be displayed if PLAY is pressed and PLAYBACK LOCKOUT is on
"CONNECT VALID DISK"	displayed if PLAY or RECORD is pressed but disk is not connected
"DISK BUSY"	displayed if PLAY or RECORD is pressed but disk is busy (reserved, e.g. for song selection)
"DISK TOO SLOW"	displayed if requests to the DISK have not been serviced in time.
"NEW SONG"	displayed if the user presses RECORD during record to start a new song
"NO SONG SELECTED"	displayed if someone presses PLAY but no song is selected
"SELECT VALID DISK"	displayed if PLAY or RECORD is pressed but the disk is not valid
"DISK FULL"	displayed if PLAY or RECORD is pressed but the disk is full
"CHECK/SELECT DISK"	displayed if PLAY or RECORD is pressed but the disk returns an error
"GENERAL ERROR"	displayed if there is an internal error, e.g. out of memory
"BAD SONG FILE"	displayed if PLAY or RECORD is pressed on a corrupted song file
"CAN'T FIND SONG"	displayed if PLAY or RECORD is pressed when the selected song is not available
"CAN'T FIND FOLDER"	displayed if PLAY or RECORD is pressed when the selected folder is not available
"LOOP TOO SHORT"	displayed if LOOP is pressed and the loop length is too short
"CHECK MASTER SIGNAL"	displayed if Slave is not receiving clock and control from Master
"REMOTE CONTROLLED"	displayed when in remote control or slave mode, and a disabled operation is attempted



"PLAY OUT OF RANGE"	when in remote control or slave mode, PLAYBACK is attempted outside the timecode limits of the selected Song
"DIGITAL INPUT MISSING"	A source of digital audio is not correctly plugged in or has vanished
"DIGITAL SLIP"	A source of digital audio is not properly synchronised with the BlackBox and is slipping with respect to the chosen clock source
"REF CLOCK MISSING"	The external reference clock is not providing a valid clock signal
"PRE ROLL MISSED"	The Pre Roll setting in Setup; Control is too short.

JoeCo Conditions of Use

IMPORTANT: BY USING THIS PRODUCT YOU ACKNOWLEDGE THAT YOU HAVE READ, UNDERSTOOD AND AGREE TO BE BOUND BY THESE CONDITIONS OF USE AND THE TERMS OF THE JOECO SOFTWARE LICENCE AGREEMENT. JOECO'S SOFTWARE LICENCE AGREEMENT IS SET OUT IN THE USER MANUAL AND MAY ALSO BE FOUND ON THE JOECO WEBSITE AT WWW.JOECO.CO.UK

PLEASE READ THESE CONDITIONS OF USE (THE "CONDITIONS") CAREFULLY BEFORE USING YOUR JOECO PRODUCT. BY USING YOUR JOECO PRODUCT YOU ARE AGREEING TO BE BOUND BY THESE CONDITIONS. IF YOU DO NOT AGREE WITH THESE CONDITIONS, DO NOT USE THIS PRODUCT.

IF YOU DO NOT AGREE WITH THESE CONDITIONS, YOU MAY RETURN THIS PRODUCT WITHIN SEVEN DAYS OF THE DATE YOU RECEIVED IT TO THE AUTHORISED DISTRIBUTOR OR RESELLER WHERE YOU PURCHASED IT FOR A REFUND, SUBJECT TO JOECO'S PRODUCT RETURNS POLICY. JOECO'S PRODUCT RETURNS POLICY IS SET OUT IN THE PRODUCT USER MANUAL AND MAY ALSO BE FOUND ON THE JOECO WEBSITE AT www.joeco.co.uk

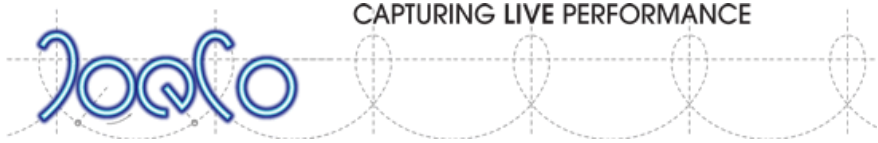
Definitions

JoeCo:	JoeCo Limited
Product:	any product designed, manufactured, distributed or resold by JoeCo including the BlackBox Recorder (which may be abbreviated to "BBR"). The term "product" includes both the hardware and its associated software, as defined below.
Legitimate User:	a legitimate user (hereinafter referred to as a "User") is a person, or corporate entity or employee of a corporate entity who is: - the owner of a Product (following its original purchase from JoeCo, or an authorised JoeCo distributor or reseller, or its subsequent purchase from a legitimate owner) and has accepted the terms of this agreement - using a Product on loan from its owner, where the owner has given their express permission and ensured that the user does so only on condition that they first accept the terms of this agreement - using a Product under a rental agreement with its owner, where the owner has ensured that the user does so only on condition that they first accept the terms of this agreement - using a Product under a temporary evaluation arrangement with its owner (which may be JoeCo or one of its authorised distributors or resellers), for a period determined by the owner, where the owner has ensured that the user does so only on condition that they first accept the terms of this agreement
Hardware:	the tangible elements of the Product
Software:	the operating software of the Product (whether in read only memory, on any other media or in any other form) supplied by JoeCo whether installed at the factory or subsequently upgraded by yourself, an authorised JoeCo distributor or reseller, or any other individual or organisation. It includes remote control software, documentation, data and any other software, including software updates, supplied by JoeCo.

1. Risk and Limitations of Product Use

You, the User, expressly acknowledge and agree that:

- To the maximum extent permitted by applicable law, use of the JoeCo Software is at your sole risk and that the entire risk as to satisfactory quality, performance and accuracy is with you.
- You have evaluated the Product and accepted the suitability for your application.



- JoeCo Products are not designed, intended or suitable for use in any life-critical applications or situations or environments where the failure or time delays of, or errors or inaccuracies in, the content, data or information provided by the JoeCo Product could lead to death, personal injury, or severe physical or environmental damage. Any such use is entirely at the risk of the User and JoeCo and its authorised distributors and resellers have no responsibility or liability whatsoever for any claim arising from such use.
- JoeCo recorder Products are designed to enable you to record and reproduce material to which you own the copyright, or material which the copyright owner has granted you permission to record and/or reproduce.
- It is illegal to record, reproduce, distribute, sell, hire, lend, perform or broadcast all or part of a work (written or musical composition, broadcast, performance or similar) whose copyright is held by a third party without permission of that third party.
- JoeCo Products must not be used for purposes that could infringe a copyright held by a third party or could, in any other way, be illegal. Any such use is entirely at the risk of the User and JoeCo and its authorised distributors and resellers have no responsibility or liability whatsoever for any claim arising from such use.

2. Limitations of Liability

Except for JoeCo's limited Hardware Warranty (see Warranty Information in the relevant JoeCo User Manual or via the JoeCo website at www.joeco.co.uk), to the maximum extent permitted by applicable law, JoeCo hereby disclaims all warranties and conditions with respect to the Product and any services performed by use of the Product, either express, implied or statutory, including, but not limited to, the implied warranties and/or conditions of merchantability, satisfactory quality, fitness for a particular purpose, accuracy, non-infringement of third party rights or other implied warranties or conditions.

No oral or written information or advice given by JoeCo or by an authorised JoeCo distributor, reseller or representative shall create a warranty of any kind.

In no event will JoeCo be liable for incidental, consequential, special, indirect or other damages or claims, even if its agents have been advised of the possibility of such damages, resulting from the breach of any express or implied warranty. Such damages may include but are not limited to the following:

- any loss of profit or any other commercial damage
- partial or total loss of data incurred whilst using the Product
- the cost of recovery of lost data
- inability to use or to continue to use the Product itself or any connected device
- damage to property
- damage based on inconvenience, loss of time or interrupted operation

and, to the extent permitted by law, damages for personal injury.

In no event will JoeCo's liability for any damages to the User, purchaser or any other person exceed the price paid for the Product, regardless of any form of the claim.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so some of the above limitations or exclusions may not apply to you.

Software Licence Agreement

JOECO LIMITED

SOFTWARE LICENCE AGREEMENT

USER LICENCE

IMPORTANT: BY USING THIS PRODUCT YOU ACKNOWLEDGE THAT YOU HAVE READ, UNDERSTOOD AND AGREE TO BE BOUND BY THE TERMS OF THIS SOFTWARE LICENCE AGREEMENT AND THE JOECO CONDITIONS OF USE. JOECO'S CONDITIONS OF USE ARE SET OUT IN THE USER MANUAL AND MAY ALSO BE FOUND ON THE JOECO WEBSITE AT WWW.JOECO.CO.UK

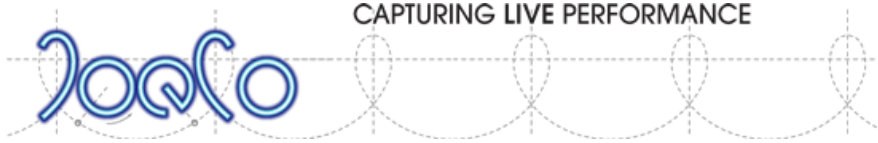
PLEASE READ THIS SOFTWARE LICENCE AGREEMENT (THE "LICENCE") CAREFULLY BEFORE USING YOUR JOECO PRODUCT OR DOWNLOADING ANY SOFTWARE UPDATES. BY USING YOUR JOECO PRODUCT OR DOWNLOADING ANY SOFTWARE UPDATES, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS LICENCE. IF YOU DO NOT AGREE WITH THE TERMS OF THIS LICENCE, DO NOT USE THIS PRODUCT OR DOWNLOAD OR INSTALL ANY SOFTWARE UPDATES.

IF YOU DO NOT AGREE WITH THE TERMS OF THE LICENCE, YOU MAY RETURN THIS PRODUCT WITHIN SEVEN DAYS OF THE DATE YOU RECEIVED IT TO THE AUTHORISED DISTRIBUTOR OR RESELLER WHERE YOU PURCHASED IT FOR A REFUND, SUBJECT TO JOECO'S PRODUCT RETURNS POLICY. JOECO'S PRODUCT RETURNS POLICY IS SET OUT IN THE PRODUCT USER MANUAL AND MAY ALSO BE FOUND ON THE JOECO WEBSITE AT www.joeco.co.uk

IN ADDITION, BY DOWNLOADING, COPYING, INSTALLING OR OTHERWISE USING SOFTWARE UPDATES FROM JOECO YOU AGREE TO BE BOUND BY ANY ADDITIONAL LICENCE TERMS THAT ACCOMPANY ANY SUCH UPDATES. IF YOU DO NOT AGREE TO THE ADDITIONAL LICENCE TERMS THAT ACCOMPANY SUCH UPDATES, YOU MAY NOT DOWNLOAD, COPY, INSTALL OR OTHERWISE USE SUCH UPDATES.

Definitions Used In This Agreement

JoeCo:	JoeCo Limited
Product:	Any product designed, manufactured, distributed or resold by JoeCo including the BlackBox Recorder (which may be abbreviated to "BBR"). The term "product" includes both the hardware and its associated software, as defined below.
Legitimate User:	A legitimate user (hereinafter referred to as a "User") is a person, or corporate entity or employee of a corporate entity who is: - the owner of a Product (following its original purchase from JoeCo, or an authorised JoeCo distributor or reseller, or its subsequent purchase from a legitimate owner) and has accepted the terms of this agreement - using a Product on loan from its owner, where the owner has given their express permission and ensured that the user does so only on condition that they first accept the terms of this agreement - using a Product under a rental agreement with its owner, where the owner has ensured that the user does so only on condition that they first accept the terms of this agreement - using a Product under a temporary evaluation arrangement with its owner (which may be JoeCo or one of its authorised distributors or resellers), for a period determined by the owner, where the owner has ensured that the user does so only on condition that they first accept the terms of this agreement
Hardware:	The tangible elements of the Product



Software: The operating software of the Product (whether in read only memory, on any other media or in any other form) supplied by JoeCo whether installed at the factory or subsequently upgraded by yourself, an authorised JoeCo distributor or reseller, or any other individual or organisation. It includes remote control software, documentation, data and any other software, including software updates, supplied by JoeCo.

1. General

You agree that:

- The Software is licensed, not sold, to you by JoeCo for use only under the terms of this Licence on the associated Product
- All ownership rights to the Software belong to JoeCo and/or to JoeCo's co-developers or suppliers
- You will not copy (except as expressly authorised by this Licence or separately in writing by JoeCo) or attempt to decompile, reverse engineer, disassemble, derive the source code, modify or create derived works of any aspects of the Software or hardware provided by JoeCo. You accept that any attempt to do so would be a violation of the rights of JoeCo, its co-developers and suppliers and constitute a breach of this agreement.
- JoeCo, its co-developers and suppliers reserve all their rights not expressly granted to you.
- You will use the Software in compliance with all applicable laws, including local laws of the country or region in which you live and/or use the Software and/or download updates to the Software

Parts of the Software and Product hardware are protected by international patents either granted or pending and other intellectual property rights.

No licence is granted by this document for use beyond the licensed use of the Software. Violation is subject to damages under applicable laws.

2. User Licence

You, the User, are entitled to use all parts of the Software for the duration of the life of the Product.

If the Product is sold on to a third party a new user is entitled to the same use, that is to use all parts of the Software for the duration of the life of the Product, provided that they agree to all the terms of this Licence.

3. Additional Charge Items

From time to time JoeCo, or third parties authorised by JoeCo, may make available software which by reason of third party licensing or specific extra cost of development or other reason, may be subject to additional charges for use. At its sole discretion JoeCo may issue separate licence agreements regarding evaluation or use for such additional charge items. If JoeCo does not issue a separate licence agreement with any additional charge item then the software embodied in that additional charge item will fall under the provisions of this Software Licence Agreement.

4. Limitations of Use

The Software must not be used for any illegal purposes and especially not for any use involving breach of copyright. The Software is not licensed for use in any life-critical application. You acknowledge that the JoeCo Software is not intended or suitable for use in situations or environments where the failure or time delays of, or errors or inaccuracies in, the content, data or information provided by the JoeCo software or services could lead to death, personal injury, or severe physical or environmental damage. Any such use is entirely at the risk of the user and the user must hold JoeCo harmless for any claim arising from such use.

5. Limitations of Liability

You, the User, expressly acknowledge and agree that:

- to the maximum extent permitted by applicable law, use of the JoeCo Software is at your sole risk and that the entire risk as to satisfactory quality, performance and accuracy is with you
- you have evaluated the Software together with the hardware and accepted its suitability for your application

To the maximum extent permitted by applicable law, JoeCo hereby disclaims all warranties and conditions with respect to the Software and any services performed by use of the Software, either express, implied or statutory, including, but



not limited to, the implied warranties and/or conditions of merchantability, satisfactory quality, fitness for a particular purpose, accuracy, non-infringement of third party rights or other implied warranties or conditions.

No oral or written information or advice given by JoeCo or by an authorised JoeCo distributor, reseller or representative shall create a warranty of any kind.

Should the Software prove defective or unsuitable for your application, you will assume the entire cost of all necessary correction, servicing or repair.

Users of JoeCo products who upgrade to this Software from a previous version should note that JoeCo has no requirement to supply free of charge upgrades but does so in the interest of adding additional functionality and improvements for the benefit of its customers. In the event that a change of functionality is made that is not of benefit to you, your sole recourse is to revert to a previous version of the Software as already properly used under licence and accepted for use by you.

In no event will JoeCo be liable for incidental, consequential, special, indirect or other damages or claims, even if its agents have been advised of the possibility of such damages, resulting from the breach of any express or implied warranty. Such damages may include but are not limited to the following:

- any loss of profit or any other commercial damage
- partial or total loss of data incurred whilst using the Product
- the cost of recovery of lost data
- inability to use or to continue to use the Product itself or any connected device
- damage to property
- damage based on inconvenience, loss of time or interrupted operation

and, to the extent permitted by law, damages for personal injury.

In no event will JoeCo's liability for any damages to the User, purchaser or any other person exceed the price paid for the Product, regardless of any form of the claim.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so some of the above limitations or exclusions may not apply to you.

6. Termination of Licence

This Licence is effective until terminated. Breach of any terms of this Licence by an owner or user of a Product will automatically terminate the Licence. The Licence is also terminated if the Product is returned under warranty or in exchange for a full or partial refund or in exchange or part-exchange for another product. Upon termination you will cease all use of the Software and destroy or return any copies of the Software to JoeCo. Sections 1, 3, 4, 5, 6, 8, 9, 10 and 11 of this Licence shall survive any such termination.

7. Force Majeure

JoeCo will not be liable or responsible for any failure to perform, or delay in performance of, any of its obligations under this Licence that are caused by an event outside of its reasonable control.

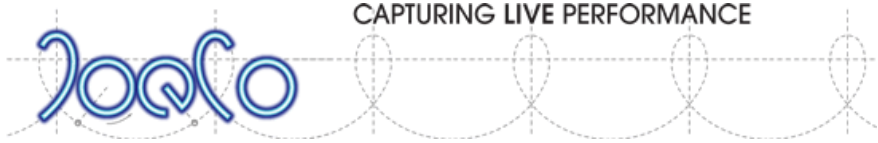
8. Waiver

If JoeCo fails, at any time during the term of this Licence, to insist upon strict performance of any of your obligations under this Licence, or if it fails to exercise any of the rights or remedies to which it is entitled under this Licence, this shall not constitute a waiver of such rights or remedies and shall not relieve you from compliance with such obligations. A waiver by JoeCo of any default shall not constitute a waiver of any subsequent default.

No waiver by JoeCo of any of the terms of this Licence shall be effective unless it is expressly stated to be a waiver and is communicated to you in writing.

9. Severability

If any provision of this Licence is found void, invalid or unenforceable, it will not affect the validity of the balance of the Licence, which shall remain valid and enforceable according to its terms. In the event any remedy hereunder is



determined to have failed of its essential purpose, all limitations of liability and exclusion of damages set forth herein shall remain in full force and effect.

10. Entire Agreement

This Licence constitutes the entire agreement between you, the User, and JoeCo relating to the Software and supersedes all prior written agreements and verbal or written undertakings. JoeCo will not be bound by any modification or amendment of this Licence unless it is in writing and signed by JoeCo.

You acknowledge that, in agreeing to the terms of this Licence, you have not relied on any representation, undertaking or promise given or implied from anything said or written by JoeCo or by an authorised JoeCo distributor, reseller or representative prior to entering into this Licence except as expressly stated in this Licence.

In the event that any translation of this Licence (from its original in UK-English language version) is carried out for different countries and there is a dispute between the UK-English and any non UK-English version, the UK-English version of this Licence shall take precedence, to the extent not prohibited by local law in your jurisdiction.

11. Governing Law

This Licence shall be construed, interpreted, and governed by the laws of England. This Licence shall not be governed by the United Nations Convention on Contracts for the International Sale of Goods, the application of which is hereby expressly excluded.

Warranty Information

1. Warranty

Except as specified below, JoeCo Limited (hereinafter referred to as JoeCo) warrants the hardware elements of this JoeCo Product (hereinafter referred to as the 'Hardware') to be free of defects in materials and workmanship for a period of one (1) year for parts and labour from date of original retail purchase, provided that:

- the Product is owned by the original purchaser
- the purchaser has proof of purchase from an authorised JoeCo distributor or reseller
- the purchaser has registered the Product with JoeCo

The following are not covered by the Warranty, damage:

- resulting from abnormal use, misuse, abuse, neglect or accident
- sustained as a result of failure to follow instructions provided in the user manual
- which occurs during shipping, in which case claims must be presented to the carrier
- resulting from attempted repair by anyone other than JoeCo or a JoeCo distributor, reseller or service provider specifically authorised by JoeCo to service JoeCo's Products
- to any Product which has been modified or on which the Product identification details have been altered or removed.

This Warranty:

- gives you specific legal rights, and you may also have other rights in certain countries or states
- provides that, during the Warranty period, JoeCo will, at its sole option, either replace, repair or refund the purchase price of any JoeCo Product that proves to be defective in materials or workmanship on inspection by JoeCo or one of its authorised service providers
- excludes power supplies and cables
- includes labour and materials (except power supplies and cables) but excludes shipping to and from JoeCo or one of its authorised service providers, minimal handling charges and insurance
- is only valid within the country in which the Product was originally purchased
- can only be exercised by the original retail purchaser and cannot be assigned or transferred
- starts from the date of delivery from the JoeCo distributor or reseller to the purchaser
- is extended to the minimum level required by law in those countries or states in which such extension is required by legislation
- applies to a repaired or replacement Product until the end of the period of the original Warranty or thirty days from the date of dispatch of the repaired or replaced Product, whichever is the longer.

2. Claims Under Warranty

To make a claim under Warranty, the purchaser must first call, email or write to JoeCo (see the JoeCo website at www.joeco.co.uk for contact details) to provide a description of the problem and to obtain a Returned Materials Authorisation (RMA) number. If it is determined that the Hardware may be defective, you will be given an RMA number and instructions for returning the Product.

Any Product which is returned to JoeCo or to one of its distributors or resellers without authorisation, i.e. one for which an RMA number has not been issued by JoeCo, will be returned to the purchaser at the purchaser's expense.

After the RMA number is obtained, the Product (including the power supply) should be shipped to the address given by JoeCo in protective packaging (the original packaging if possible) with a description of the problem and proof of Warranty coverage. The RMA number should be clearly written on the package.

Proof of Warranty coverage must be presented in the form of the original dated sales receipt or other positive proof that the Product is within the Warranty period.

When returning goods under Warranty, the purchaser is responsible for shipment and for the risk of loss or damage during shipment. JoeCo therefore recommends that such shipments are fully insured and sent by Registered Post, Recorded Delivery, or via a courier to guarantee receipt.

In the event that JoeCo determines that the Product requires repair because of abnormal use, misuse, abuse, neglect or accident, it will assess a fair repair or replacement fee. The purchaser will have the option (exercisable within thirty days of notification by JoeCo) to pay this fee and have the Product repaired and returned, or not pay this fee and have the Product returned un-repaired at their expense. Thereafter JoeCo reserves the right to dispose of such un-repaired product without further notification.

JoeCo reserves the right to update any Product returned under Warranty.

3. Limitations of Liability

JoeCo specifically disclaims all other warranties. The Warranty contained herein supersedes any other warranties or representations whether express or implied or otherwise, with respect to the Product, and specifically excludes any implied warranties and/or conditions of merchantability, satisfactory quality, fitness for a particular purpose, accuracy, non-infringement of third party rights or other implied warranties or conditions.

The remedy for breach of this limited Warranty shall not include any other damages. In no event will JoeCo be liable for incidental, consequential, special, indirect or other damages or claims, even if its agents have been advised of the possibility of such damages, resulting from the breach of any express or implied warranty. Such damages may include but are not limited to the following:

- any loss of profit or any other commercial damage
- partial or total loss of data incurred whilst using the Product
- the cost of recovery of lost data
- inability to use or to continue to use the Product itself or any connected device
- damage to property
- damage based on inconvenience, loss of time or interrupted operation

and, to the extent permitted by law, damages for personal injury.

In no event will JoeCo's liability for any damages to the purchaser or any other person exceed the price paid for the Product, regardless of any form of the claim.

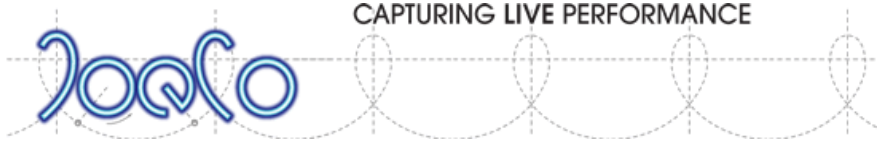
Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so some of the above limitations or exclusions may not apply to you.

4. Product Changes and Improvements

JoeCo reserves the right to change or improve the design of its products at any time without prior notice.

5. Force Majeure

JoeCo will not be liable or responsible for any failure to perform, or delay in performance of, any of its obligations under this Warranty that are caused by an event outside of its reasonable control.



6. Waiver

If JoeCo fails, at any time during the term of this Warranty, to insist upon strict performance of any of your obligations under this Warranty, or if it fails to exercise any of the rights or remedies to which it is entitled under this Warranty, this shall not constitute a waiver of such rights or remedies and shall not relieve you from compliance with such obligations.

A waiver by JoeCo of any default shall not constitute a waiver of any subsequent default.

No waiver by JoeCo of any of the terms of this Warranty shall be effective unless it is expressly stated to be a waiver and is communicated to you in writing.

7. Severability

If any provision of this Warranty is found void, invalid or unenforceable, it will not affect the validity of the balance of the Warranty, which shall remain valid and enforceable according to its terms. In the event any remedy hereunder is determined to have failed of its essential purpose, all limitations of liability and exclusion of damages set forth herein shall remain in full force and effect.

8. Entire Warranty

This Warranty constitutes the entire warranty provided to you by JoeCo and supersedes all prior written agreements and all representations, undertakings and promises given or implied by anything said or written by JoeCo or by an authorised JoeCo distributor, reseller or representative. JoeCo will not be bound by any modification or amendment of this Warranty unless it is in writing and signed by JoeCo.

In the event that any translation of this Warranty (from its original in UK-English language version) is carried out for different countries and there is a dispute between the UK-English and any non UK-English version, the UK-English version of this Licence shall take precedence, to the extent not prohibited by local law in your jurisdiction.

9. Jurisdiction

This Warranty shall be construed, interpreted, and governed by the laws of England. This Warranty shall not be governed by the United Nations Convention on Contracts for the International Sale of Goods, the application of which is hereby expressly excluded.

Product Returns

To return any JoeCo Product, the purchaser must first call, email or write to JoeCo (see the JoeCo website at www.joeco.co.uk for contact details) to obtain JoeCo's agreement to the return and a Returned Materials Authorisation (RMA) number. JoeCo will issue an RMA and instructions for returning the Product if it agrees that:

- the Product can be returned,
- an incorrect Product has been delivered,
- the Product is faulty and covered by warranty (see Warranty Information), or
- the Product is capable of being repaired if outside warranty

Please note that any Product returned due to incorrect delivery must be in a resalable condition to receive a credit note.

Any Product which is returned to JoeCo or to one of its distributors or resellers without authorisation, i.e. one for which an RMA number has not been issued by JoeCo, will be returned to the purchaser at the purchaser's expense.

After the RMA number is obtained, the Product should be shipped to the address provided by JoeCo in protective packaging (the original packaging if possible) with a note giving the reason for the return. The RMA number should be clearly written on the package.

When returning goods, the purchaser is responsible for shipment and for the risk of loss or damage during shipment. JoeCo therefore recommends that such shipments are fully insured and sent by Registered Post, Recorded Delivery, or via a courier to guarantee receipt.

Where a Product is returned for repair outside warranty, JoeCo will inspect the Product and provide the purchaser with an estimated fee for repair. The purchaser will have the option (exercisable within thirty days of notification by JoeCo) to pay this fee and have the Product repaired and returned, or not pay this fee and have the Product returned un-repaired at their expense. Thereafter JoeCo reserves the right to dispose of such un-repaired product without further notification.

JoeCo reserves the right to update any Product returned for repair.

Product and End User Registration

It is recommended that you register yourself as an End User of the BlackBox Recorder product on the JoeCo website at your earliest opportunity. This completes your warranty registration, allows you access to software updates which JoeCo may release from time to time and a lot of additional information.

To register as an End User please go to the JoeCo website www.joeco.co.uk and select the **Log In** button to the right-hand side of the blue menu bar. Once in the Log In area, select the New Registration Link and fill out your details. It is important to fill out all your details including the full model and serial number of your BlackBox Recorder. If all you need at the moment is documentation, register as a visitor initially – it's quicker – and then upgrade to an End User later.

Once your registration has been submitted it will be forwarded to JoeCo personnel who will need to approve your application before issuing you with a password.

JoeCo can only provide support for the current release of software. It is therefore imperative that you download and use the latest software release

We hope you enjoy using your BlackBox Recorder – we certainly have enjoyed designing it!