MODEL SOUNDS INC.
The World's Ultimate RC Sound Systems

This is a Quick Start Guide only containing generic and typical instructions. Please follow your module specific connection instructions on the large label on the anti-static bag that the module came in.

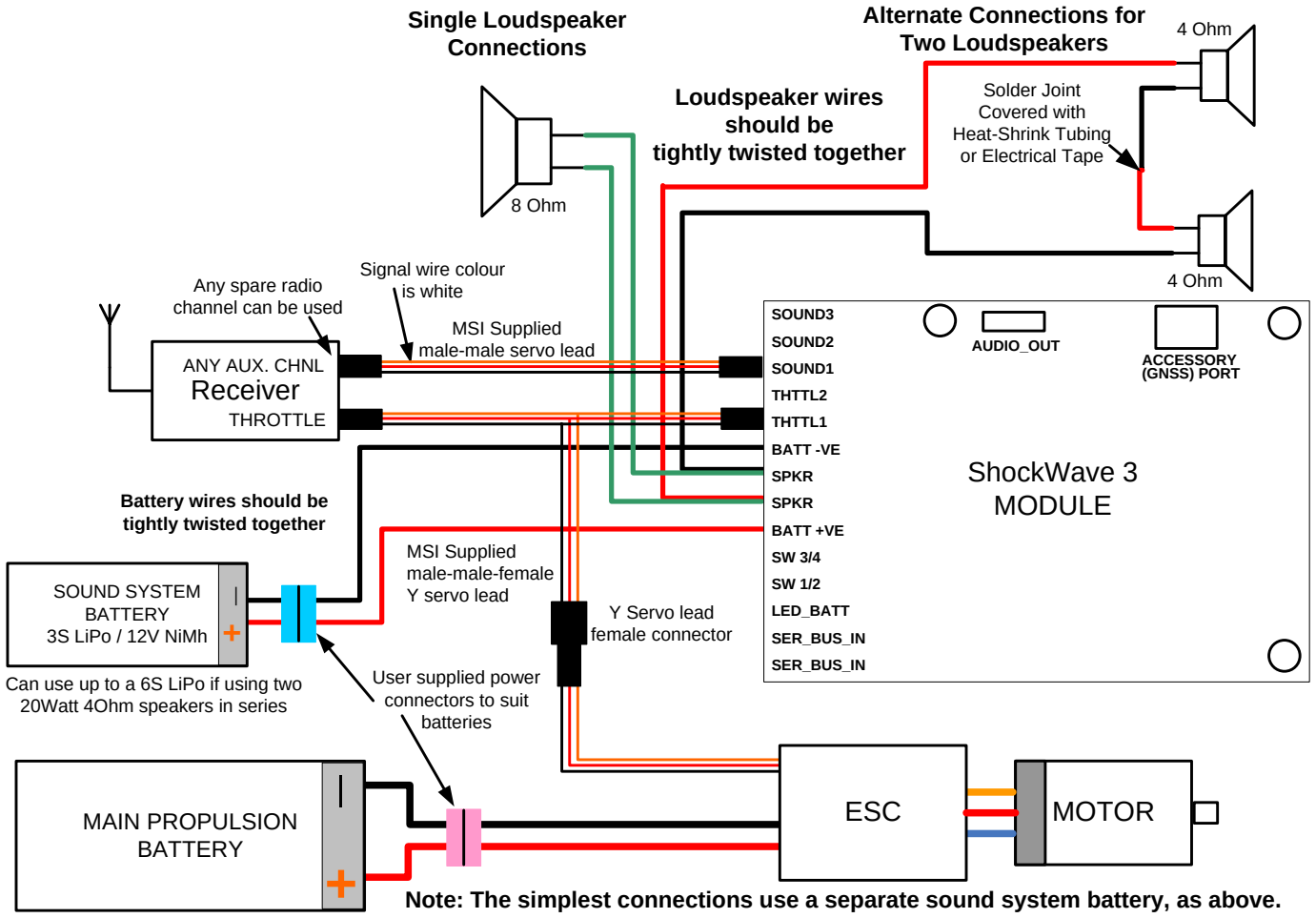
For comprehensive instructions, please read the ShockWave3HWReferenceManual.pdf document in the Manuals-Instructions folder on the microSD Card that is in the sound module. Insert the microSD Card into the included USB microSD card reader and insert that into one of your computer's USB ports.

MAKE BACKUP COPIES OF THE CONTENTS OF THE MICROSD CARD!
ALWAYS MAKE BACKUP COPIES OF ANY KIND ON TO MORE THAN ONE DRIVE OR EXTERNAL MEDIA!

WARNING: DO NOT EXCEED THESE BATTERY VOLTAGES	One 4Ohm 20Watt Speaker/Exciter	Two 4Ohm 20Watt Speakers/Exciters in series
Maximum Battery Voltage	3S LiPo / 12 Volt NiMh or lead gel	6S LiPo

TYPICAL WIRING FOR ONE THROTTLE – USING ESC BEC (BATTERY ELIMINATOR CIRCUIT)

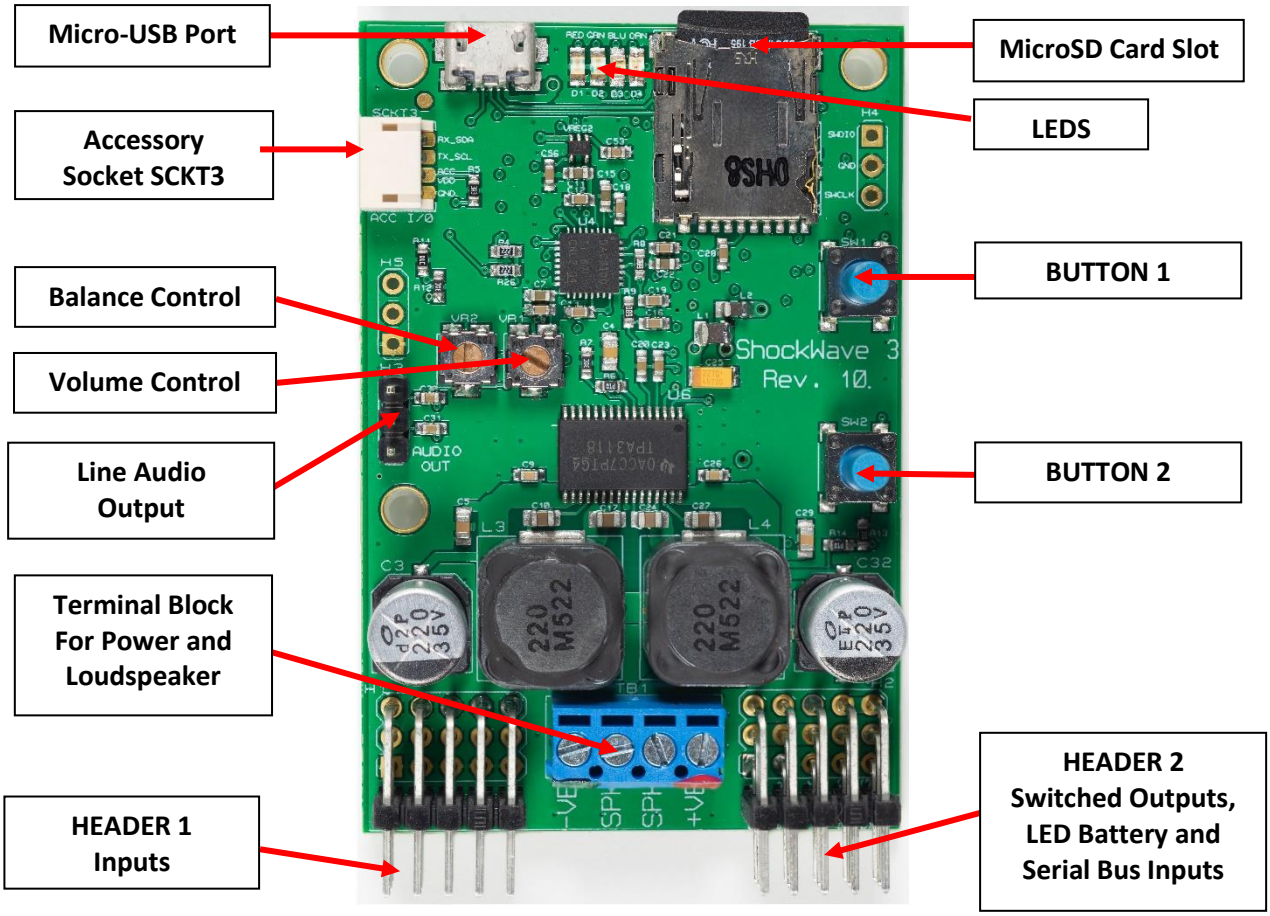
For other possible wiring scenarios, refer to the ShockWave3HWReferenceManual.pdf document.



Note: The simplest connections use a separate sound system battery, as above. You can use the same battery as the ESC/Motor but you'll need a Y Power splitter lead with suitable connectors to feed the one battery to both the ESC and the sound module.

DO NOT REVERSE THE BATTERY CONNECTIONS. THE MODULE WILL BE DESTROYED IF YOU DO.

SHOCKWAVE 3 SOUND MODULE CONNECTIONS



Recommended gauge for loudspeaker and battery wire is 22AWG solid core. Do not use stranded wire.

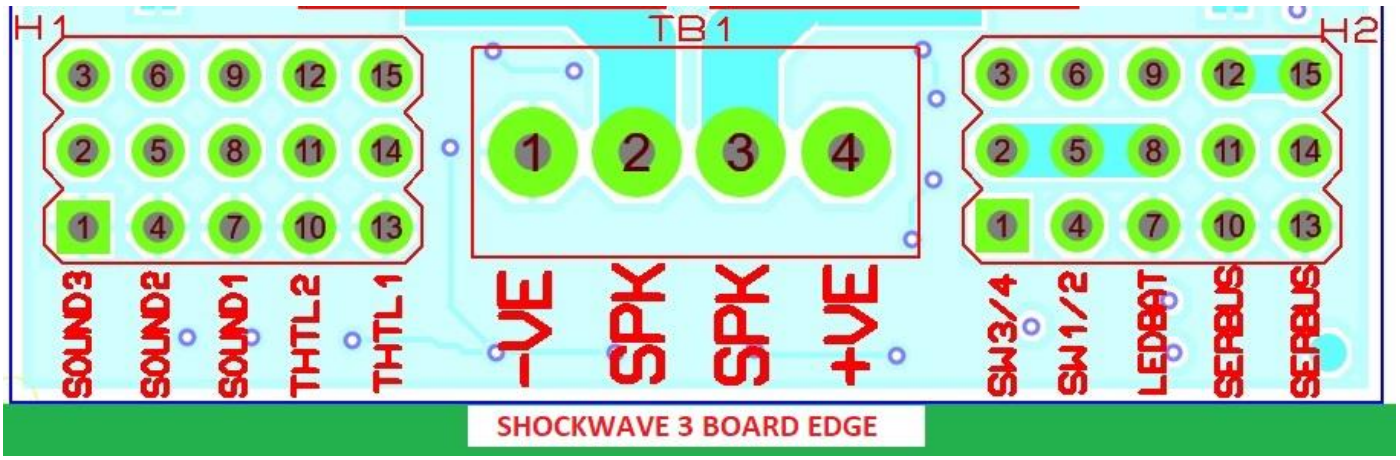
ENABLING/DISABLING INITIAL VOICE ANNOUNCEMENT

The initial **Voice Announcement** of the configured sound set is enabled by default. To switch it off, once the red/green LEDs have stopped flashing, press and release **BUTTON 1** quickly within 1.5 seconds. To switch it on again, press and hold down **BUTTON 1** for longer than 1.5 seconds.

BEFORE MOUNTING IN YOUR MODEL - THROTTLE CALIBRATION IS REQUIRED

It is necessary to manually calibrate the throttle input to your radio transmitter/receiver pair. This should be done on the bench **BEFORE** installing the sound module in your model. Before you begin, make sure your throttle stick is in the off position (model aircraft) or in the centre neutral/off position (model boats or land vehicles). Once wired and powered up, press **BUTTON 1 (for THTTL1 input)** during the initial period when the red/green LEDS are flashing alternately. This will enter the precision throttle setup voice-guided procedure. Just follow the voice-guided instructions. This needs to be done **ONCE ONLY** unless you change your radio transmitter or receiver, or throttle settings.

TERMINAL BLOCK TB1 AND CONNECTOR H1/H2 DETAIL



HEADER 1 (H1) Detail – Use Male-Male or Male-Male-Female Servo Leads

Pin Numbers	Board Legend	Function	Notes
1, 2, 3	SOUND3	**Sound Select3** signal in from receiver. **Pin 1 is GND, 2 is receiver power, 3 is Sound Select3 signal.**	**Receiver power is on pin 2**
4, 5, 6	SOUND2	**Sound Select2** signal in from receiver. **Pin 4 is GND, 5 is receiver power, 6 is Sound Select2 signal.**	**Receiver power is on pin 5**
7, 8, 9	SOUND1	**Sound Select1** signal in from receiver. **Pin 7 is GND, 8 is receiver power, 9 is Sound Select1 signal.**	**Receiver power is on pin 8**
10, 11, 12	THTTL2	**Throttle2** signal input from receiver. **Pin 10 is GND, 11 is receiver power, 12 is Throttle2 signal.**	**Receiver power is on pin 11**
13, 14, 15	THTTL1	**Throttle1** signal input from receiver. **Pin 13 is GND, 14 is receiver power, 15 is Throttle1 signal.**	**Receiver power is on pin 14**

The **BLACK GND (battery -VE)** servo lead wire always goes towards the edge of the board.

Terminal Block TB1 Detail – Use 22AWG solid core wire

Pin Numbers	Board Legend	Function	Notes
1	--VE	**Main Battery negative 4.5 Volts – 26 Volts**	**Do NOT reverse Battery leads!!**
2,3	SPKR	**Loudspeaker - Do NOT use less than 8 Ohms on voltages above 14.4 Volts. 4 Ohms is OK on 4.5 - 14.4 Volts.**	**Loudspeaker leads are reversible.**
4	++VE	**Main Battery positive 4.5 Volts – 26 Volts**	**Do NOT reverse Battery leads!!**

DO NOT REVERSE THE BATTERY CONNECTIONS. THE MODULE WILL BE DESTROYED IF YOU DO.

HEADER 2 (H2) Detail

Pin Numbers	Board Legend	Function	Notes
1, 2, 3	SW 3/4	LED Switched Outputs 3/4. Pin 1 is SWITCH4. Pin 2 is LEDBATT POWER. Pin 3 is SWITCH3.	LEDBATT POWER is on pin 2.
4, 5, 6	SW 1/2	LED Switched Outputs 1/2. Pin 4 is SWITCH2. Pin 5 is LEDBATT POWER. Pin 6 is SWITCH1.	LEDBATT POWER is on pin 5.
7, 8	LEDBATT	Battery supply for Switched LED outputs. Pin 7 is battery negative. Pin 8 is battery positive.	Do NOT reverse Battery leads!!
10, 11, 12	SERBUS	Serial Bus input for digital serial data stream instead of conventional PWM inputs on H1. Pin 10 is GND, Pin 11 is receiver power, Pin 12 is serial data bus input.	Supports Spektrum SRXL2, Graupner SUMD, Futaba S.Bus and many others.
13, 14, 15	SERBUS	Serial Bus input for digital serial data stream instead of conventional PWM inputs on H1. Pin 13 is GND, Pin 14 is receiver power, Pin 15 is serial data bus input.	Supports Spektrum SRXL2, Graupner SUMD, Futaba S.Bus and many others.

NOTES :

1. LEDs for guns, afterburner lights or other switched loads can be connected between their Switch 1/2 terminals 4, 6 or Switch 3/4 terminals 1, 3 and **the LEDBATT Centre Pins. LEDBATT can be any battery up to 26Volts. DO NOT** exceed **1A** on each output or **4 Amps total** for all switched outputs.

2. The supplied male – male – female Y servo leads for Throttle and male – male Sound Select inputs are Futaba style colours (black, red, white), but with JR style male plugs for maximum flexibility.

   The black wire is always the GND, 0V or –VE connection and should always be inserted towards the outside of the receiver case and towards the board of the sound module.

WHAT ARE THE SERIAL BUS INPUTS FOR?

The above wiring diagram is typical only and uses conventional PWM (Pulse Width Modulation) outputs from the radio receiver. One input on the Header H1 represents one individual radio channel.

The serial bus inputs (on Header H2) allow you to control all the THTTL1/2 and SOUND1/2/3 control inputs using a single digital serial data line instead of up to 5 separate servo leads using the standard PWM analogue format. This is supported on certain Spektrum receivers when used with their AVIAN or FIRMA Brand SMART ESCs. Futaba S.Bus, Graupner SUMD and many more serial data formats are also supported. Further details on using the Serial Bus Inputs are found in the ShockWave3HWReferenceManual.pdf document.

Other serial bus devices can be connected in daisy-chain fashion using the second Serial Bus input pins.

CONTROLLING THE ENGINE SOUNDS

By default, the Engine Sounds are switched on and off by the throttle controls only. The engine sound increases in 16 steps of increasing speed. Nudge the throttle stick forward a little bit and the engine sound will startup. It will now increase in speed with the throttle stick position.

With some models, e.g., model tanks, and helicopters, jet or turbo-prop/turbo-fan aircraft with long turbine spool-up times, it is preferable to control the engine start-up and shutdown sounds using a switched radio channel instead of using the throttle stick. This is done using our optional **ShockWave 3 PC** Windows Software Application.

If you ordered an engine sound type like this, it will be already configured by us to use a switched radio channel to start-up and shutdown the engine sound before we shipped it to you.

If using a pistol grip style radio, the range of motion of the throttle trigger is very small making it very difficult to use that trigger to correctly startup and shutdown the engine sound.
Therefore, we do not recommend using a pistol grip style radio with our sound module.

It is far better to use an airplane style stick radio where you have better control and more channels available to switch sounds.

For both types of throttle (forwards or forwards/reverse), when using the throttle stick to startup and shutdown the engine sound, nudge the throttle control forwards a little and the corresponding engine sound will start playing. If there is a separate engine start-up sound, that sound will play and then continue to loop from its loop point. As you move the throttle stick forwards the engine sound will increase in speed.

For Forwards/Reverse throttles, always nudge the throttle stick forwards **FIRST**. This teaches the module which is forwards and reverse. If the throttle is moved back to the neutral position the engine sound will continue to play in idle indefinitely. This is good for model boats and tanks. To switch off the engine sound, nudge it into reverse very slightly and **hold it there for about 2 seconds**. If you move it too far, the engine sound will continue to play with its increasing speed. If there is a separate engine shutdown sound, it will play once then stop. If there is not a separate engine shutdown sound, the engine sound will stop after the 2 second delay.

CONTROLLING THE "REGULAR" (NON-ENGINE) SOUNDS

There are several ways of controlling the Regular (non-engine) sounds. The default method is to use a single on/off switch on the transmitter to control the sounds – this is called **"Switched RC 1xN"** mode since one transmitter switch is used to control many (N) sounds. Alternatively, if you have a four or more

channel transmitter, and are controlling a land-based vehicle, or a model boat, you can use one of the unused proportional stick channels to simulate a switch.

The different modes are selected in the optional **ShockWave 3 PC Software Control Panel->Hardware Tab** and work like this:

"Switched RC 1xN" Mode: One transmitter ON/OFF channel is used to switch N sounds

1. Toggle Sound Select 1 **from OFF to ON and back to OFF** N times quickly to select sound N. After a timeout of about 1 second (adjustable), Sound N will start playing. This is **Latched** action. Repeat to switch Sound N Off.

   OR

2. Toggle Sound Select 1 **from off to ON and back to OFF** N-1 times and then move to on position **and hold it there** – Sound N will play for as long as the switch is in that **ON** position. Release the switch to the **OFF** position to switch Sound N Off. This is **"Momentary"** action.

It is best to not use the **Latched** mode unless you really need to. That mode is meant for long playing sounds such as sonar pings, music etc. where you would not want to hold the switch/stick in the on position for too long. For all other sounds such as guns, horns, Morse code etc., it is best to use the momentary mode by holding the switch in the on position for only as long as you want that sound to play.

MOUNTING THE MODULE

Mount the module using pan-head screws. Philips or Robertson type screws are recommended to prevent screwdriver slippage damaging the board. Do not over-tighten the screws or the board may be damaged.

Mount the module where good air circulation can take place, especially when operating it above 18 Volts. The module will get mildly warm on 12 Volts and quite warm on 24 Volts if operated continuously when playing sounds. Do not be overly concerned. The output amplifier is thermally protected and will shut down if it gets too hot which, in practice, it has never done.

MICROSD CARDS

Correct operation of the sounds on the **ShockWave 3** sound module is guaranteed for only the microSD card that is supplied with it. Not all microSD cards perform the same, even if they appear to have the same specifications. The only supported microSD cards are Kingston brand Class 4 or Class 10 8GB/16GB/32GB. **DO NOT use SanDisk cards**. Please contact us at contactus@modelsoundsinc.com to purchase additional Kingston microSD cards pre-loaded with sounds.

TWO 4 INCH 20 WATT 4 OHM LOUDSPEAKERS OR TWO 2 INCH 20 WATT 4 OHM EXCITERS

If you ordered a ShockWave 3-2x4x4 or a ShockWave 3-2x2x4-EX sound system kit, it comes with two 4 inch 20 Watt 4 Ohm loudspeakers or two 2 inch 20 Watt 4 Ohm exciters. They are intended to be used in pairs and wired in **SERIES**, never in parallel.

These may be used singly **ONLY** on a 3S LiPo or a 12Volt NiMh or lead gel battery. With higher voltages than 12 Volts they **MUST** be used in pairs and wired in **SERIES**.

If your model can accommodate only one 4 inch loudspeaker, or only smaller loudspeakers, please contact us at contactus@modelsoundsinc.com for alternate loudspeakers.

MOUNTING LOUDSPEAKERS

Loudspeakers can be mounted anywhere there is space to house them. There should be a small space behind the loudspeaker to avoid undue air back pressure. They have a metal frame and a paper or plastic cone to transfer vibrations to the surrounding air which is the sound you hear.

The front (cone) of the loudspeaker must be open to the outside air so that the sound can escape and be heard without being muffled. This means that a hole that is a little smaller than the outer diameter of the loudspeaker is required in your model to let the sound out. This hole is usually covered with a piece of aluminium window mesh that is lightly painted to match your model's colour scheme. On model boats this can sometimes be disguised as a hatch cover.

Please also see these hints for loudspeaker mounting on our website:
http://www.modelsoundsinc.com/loudspeaker-installation.php

MOUNTING EXCITERS

Exciters are mounted on a flat, flexible surface using the self-adhesive tape after removing the protective paper ring. They make sound by vibrating the surface to which they are stuck using the inertia of its own mass to exert a force on that surface. That surface then vibrates the air around it to make the sound. Therefore, the surface to which it is stuck determines how much sound you get out. It should be flat and flexible. Exciters work well in foam models where the foam thickness is less than 5mm (3/16 inch). Rigid surfaces such as epoxied fibreglass or epoxied balsa wood are not very effective since they are too stiff and inflexible.

Occasionally, the self-adhesive ring may not hold the exciter permanently on the foam surface. In this case use of the Foam-Tac adhesive by Beacon Adhesives, Inc. is recommended as it remains flexible once dry. If mounting them in a foam model, make sure there is no mold release agent residue left on the foam surface as that will inhibit strong adhesion. Please also see this article from the exciter manufacturer:
http://www.modelsoundsinc.com/datasheets/UnderstandingAndUsingExciters.pdf

CHANGING SOUNDS ON YOUR SHOCKWAVE 3 SOUND MODULE

You **DO NOT** have to use a computer to set up or use the module – it is ready to use when you receive it.

The microSD card in the sound module contains our entire collection (as of the date of shipping) of airplane or helicopter or tank or boat pre-configured composite SoundSet (.sfx8) files. You can change easily to any one of them – just read the **SELECT_YOUR_SOUNDSET_HERE.txt** file in the root folder of the card.

WHEN YOU NEED TO USE OUR SHOCKWAVE 3 PC WINDOWS SOFTWARE

If you want to configure the ShockWave 3 advanced features and/or re-configure it or add/remove/edit any of the sound clips within any composite SoundSet (.sfx8) file, you will need to use our ShockWave 3 PC Windows Application which is available as an optional extra purchase.

USING THE USB MICROSD CARD READER

The supplied USB card reader is used when it is necessary to access the files on the microSD card on a computer. See the photo below for correct orientation of the microSD card in the reader.

WARRANTY

All Model Sounds Inc. products are warranted against manufacturing defects for a period of 6 months from the original date of purchase. The 6-month warranty period runs from the date you receive it, not from the date you first start using it. You are strongly advised to try the sound system out on the bench as soon as you receive it just to make sure you know how to wire it up and that everything works. **The warranty applies only to the original purchaser as we cannot guarantee the state of used or second-hand Model Sounds Inc. products.**

The warranty covers product defects only and does not cover damage or malfunction due to user wiring errors, incorrect loudspeaker impedance or power handling capacity, getting the module wet or other misuse or abuse of the module. Returns are not accepted if the customer simply "changes their mind" about the purchase. Product returns are only accepted after you communicate the problem to us at **Model Sounds Inc.**, we have researched the issue with you and we have authorized its return.