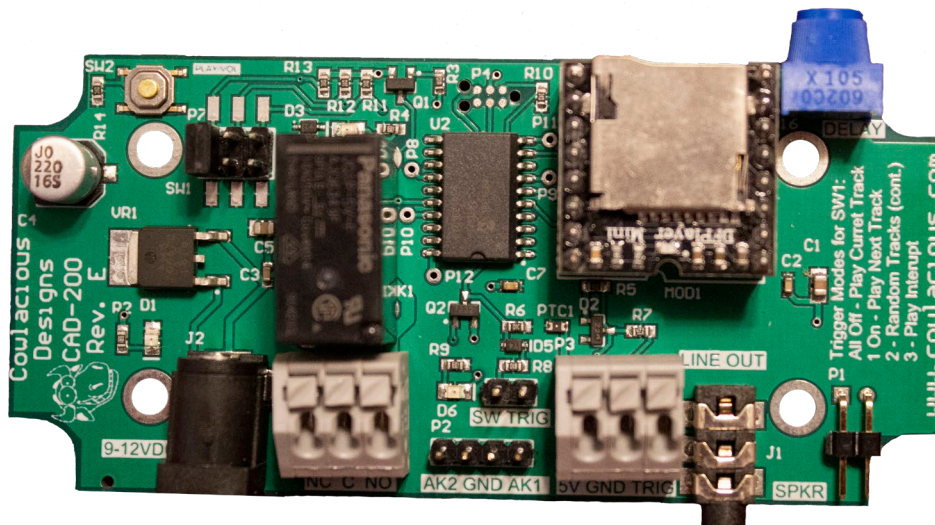# Cowlacious Designs

Cowlacious Audio Device

Manual for

CAD-200 Rev. E

Product Overview

This audio board allows triggered or continuous playback of WAV and MP3 audio files.

It can be triggered by a switch (not included), motion sensor (not included), or any DC voltage from 3.3V up to 24V.

It can play a single track or be set up to play the next track each time it is triggered. You can also have a track which plays continuously and then when the unit is triggered it will pause the playback of that track, jump to a different track and play it, and when finished playing it, then return to the previous track and continue playing it. It can also play a random track whenever it is triggered.

In continuous mode it can play the same track over and over, loop through all the tracks, or playback the tracks in random order.
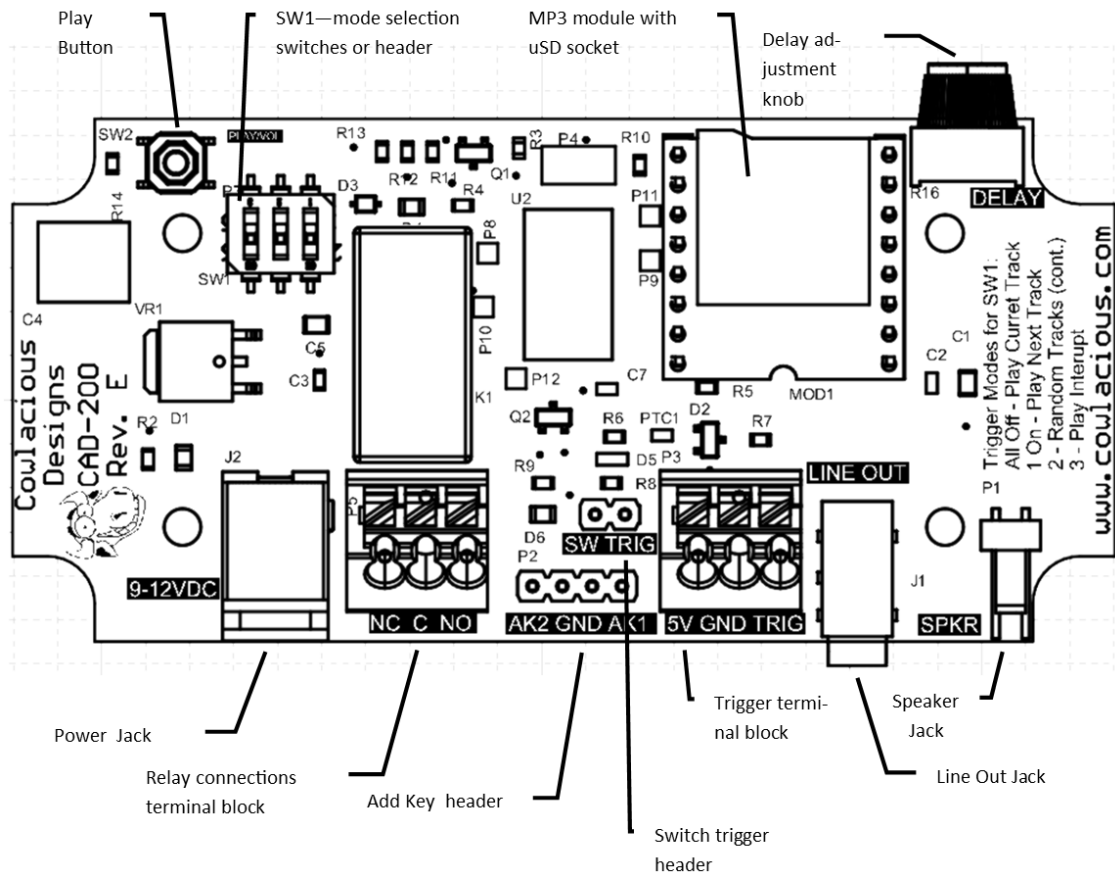
It has a built in 3 Watt mono amplifier that can connect directly to a speaker and a stereo line-out jack for sending the sound to an external amplifier or amplified speakers (such as the type you connect to your computer).

In addition, we have included a SPDT relay (an electronic switches that can turn one thing off while it turns another one on) on the board so you can switch other things on or off when your triggered sound plays!

Techinical Specifications

- Power Requirements: 9-12VDC, barrel connector is center positive, 2.1mmx5.5mm mating connector.

- Supports FAT16 and FAT32 file system on the uSD card (not included).

    o Supports maximum 32GB micro SD (uSD) card.

- WAV and MP3 Decoding

    o MP3

    o Supports 11172-3 and ISO13813-3 layer3 audio decoding.

    o Sampling rates (KHz): 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, and 48.

- 24-bit DAC output and supports dynamic range 90dB and SNR 85dB.

- Supports 3000 audio files under the root directory of the storage device.

- Built in 3W mono amplifier that can directly drive a speaker.

- PCB is designed to fit a Hammond 1591XXASFLBK case.

- Relay Technical Specs:

    o Max Switching Voltage: 30VDC, 277VAC

    o Rated Current: 5A

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Board Overview

Labels on diagram:
- Play Button
- SW1—mode selection switches or header
- MP3 module with uSD socket
- Delay adjustment knob
- Power Jack
- Relay connections terminal block
- Add Key header
- Switch trigger header
- Trigger terminal block
- Speaker Jack
- Line Out Jack

Board silkscreen text: Cowlacious Designs CAD-200 Rev. E www.cowlacious.com

Trigger Modes for SW1:
All Off - Play Curret Track
1 On - Play Next Track
2 - Random Tracks (cont.)
3 - Play Interrupt

9-12VDC, NC C NO, AK2 GND AK1, SW TRIG, 5V GND TRIG, LINE OUT, SPKR, DELAY

THIS PCB IS DESIGNED TO BE ABLE TO BE MOUNTED IN A HAMMOND 1591XXASFL CASE

Modifications to the case would be required to access the various inputs and outputs on the board.

Play Button: Pressing this button is the same as using the trigger connection. The play button also operates as a volume button. Press the play button while a track is being played back and the sound level will decrease. It will stay at that volume level as long as the unit has power. Once power is removed it will go back to its default volume level. If you lower the volume too much, just disconnect power for a few seconds and then power the unit back up to set it back to its default volume level.

SW1 - Operation Mode Switch or Header Pins:

Used to select the operation mode of the unit. There are four modes: standard, next, random, and interrupt.

MP3 Module: The MP3 module has a uSD card slot on it. This is where you will put your uSD card after loading audio files on it.

Delay Adjust Knob: Allows for a 0 to 10 second delay to be placed after any triggered event. The unit cannot be retriggered during the delay period.

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Power Jack: Connet a DC power source to this jack. Anything from 9VDC to 12VDC. It requires a 2.1mm x 5.5mm center positive power supply. DC ONLY, NO AC!

Relay Terminal Block: Provides access to the relay terminals through a spring loaded terminal block. Press down on the buttons above each terminal to insert or remove wires.
NOTE: TEXT FOR THE CONNECTIONS WRONG ON THE PCB! IT SHOULD BE "NO NC C".

AdKey Header: These can be connected to one (or two) of the AdKey boards to provide additional push buttons or the ability to to control the unit, to some extent, from another device.

Switch Trigger Header: Provides a header for connecting a switch to the board, for use as a trigger device.

Trigger Terminal Block: Provides access to the trigger terminal block through spring loaded terminals.

Audio Line-Out Jack: Use the jack to feed the audio out to an amplifier or set of ampflied speakers.

Speaker Jack: The speaker jack is for connecting a regular speaker (not amplified). It puts out up to 3W of audio power. It combines the stereo channels from the MP3 device and plays them over a single speaker. Pin 1 is positive (+) and pin2 is negative (-), though it really doesn't matter which pins are connected to the speaker terminals.

Trigger Connections:

1. Standard switch type trigger can be connected to the header marked SW TRIG.

2. Trigger terminal block that provides the ability to trigger the unit from 3.3VDC to 12VDC signal, a motion sensor (5vdc power, ground, and trigger connections are provided for a 5VDC motion sensor to connect to the board), or a switch. The 5V output is protected by a PTC self-resetting fuse with a maximum current draw of 630mA.

Relay Connections:

1. Normally Open connection is marked with 'NO'.

2. Normally Closed connection is marked with 'NC'.

3. Common connection is marked with 'C'.

NOTE: TEXT FOR THE CONNECTIONS WRONG ON THE PCB! IT SHOULD BE "NO NC C". So, the contact on the PCB that says "NC" is actually the "NO", the contact that says "C" is actually the "NC", and the contact the "NO" is actually the "C".

Operation:

Set the mode of operation for the unit through SW1 as described below. Connect your trigger device (switch, motion sensor, or other) and then provide power to the unit. There are several modes of operation as described below:

Standard Mode
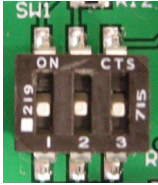
This mode is active when SW1 has all the switches in off position (slid down toward the bottom of the board) or the shorting jumper is NOT shorting any of the pins on the header (i.e. not connected across pins 5 & 6, 3 & 4, or 1 & 2) .

When triggered, the unit will play the first track that was copied to the uSD card on the root directory. If the root directory looked like the one below, then it would start playing "101 Digital Sound Effects – sounds of nature – 09- Crow cawing…". If the trigger is held constant, then the unit will play the track over and over again.
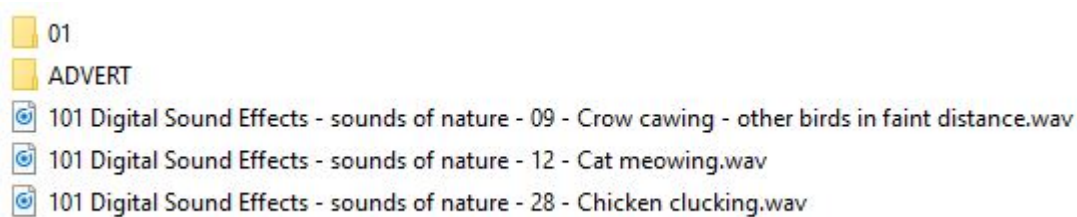
The relay will turn on (connecting the common (C) and the normally open (NO) contacts) whenever the unit is triggered and it is playing back a track. The relay will turn off (connecting the common (C) and the normally closed (NC) pins) whenever a track is not playing. LED D12, mounted on the board right above the relay, will light up indicating when the relay is on.

The DELAY knob, can be turned clockwise to add a delay of 1 to 10 seconds before the unit can be retriggered. During the delay LED D6 (just to left of the SW TRIG header) will blink once for each second it is in delay.
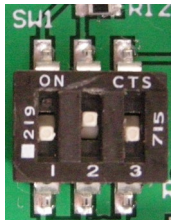
Next Mode
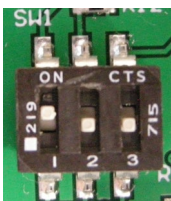
This mode is active when SW1 has dipswitch one turned on (slid up toward the top of the board) and switches two and three turned off. If a pin header is supplied, instead of a dipswitch, the shorting jumper will be connected across terminals 5 & 6.

When triggered, the unit will play one track, starting with track one. Each subsequent trigger plays the NEXT track on the uSD card. This mode includes all files on the uSD card, not just the root directory. After it has played the last track it will start over with track number one. The order the files are copied to the uSD card is the order the tracks will be played back.

The relay will turn on (connecting the common (C) and the normally open (NO) contacts) whenever the unit is triggered and it is playing a track. The relay will turn off (connecting the common (C) and the normally closed (NC) pins) whenever a track is not playing. LED D12, mounted on the board right above the relay, will light up indicating when the relay is on.

The DELAY knob, can be turned clockwise to add a delay of 1 to 10 seconds before the unit can be retriggered. During the delay LED D6 (just to left of the SW TRIG header) will blink once for each second it is in delay.
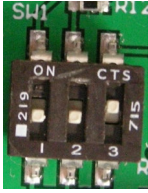
Random Mode

This mode is active when SW1 has dipswitch two turned on (slid up toward the top of the board) and switches one and three turned off. If a pin header is supplied, instead of a dipswitch, the shorting jumper will be connected across terminals 3 & 4.

When triggered, the unit will play one random track each time the unit is triggered. Each subsequent trigger plays another random track on the uSD card. This mode includes all files on the uSD card, not just the root directory.

The relay will turn on (connecting the common (C) and the normally open (NO) contacts) whenever the unit is triggered and it is playing back a track. The relay will turn off (connecting the common (C) and the normally closed (NC) pins) whenever a track is not playing. LED D12, mounted on the board right above the relay, will light up indicating when the relay is on.

The DELAY knob, can be turned clockwise to add a delay of 1 to 10 seconds before the unit can be retriggered. During the delay LED D6 (just to left of the SW TRIG header) will blink once for each second it is in delay.

Interrupt Mode

This mode is active when SW1 has dipswitch three turned on (slid up toward the top of the board) and switches one and two turned off. If a pin header is supplied, instead of a dipswitch, the shorting jumper will be connected across terminals 1 & 2.

This mode operates a bit differently from the other modes. As soon as the board is powered up it will begin to play the first track on the root of the uSD card and will play this track in a continuous loop until the unit is triggered. Once the unit is triggered it will interrupt playback of the current track and play the track that is in the ADVERT directory. The unit will go back to playing the original track, in the same location from which it was interrupted, as soon as the track in the ADVERT directory is finished playing.

A directory called "ADVERT" must be created on the uSD card and the file that is to be played during the "interruption" must be placed in that directory. In addition the file name must begin with 0001. As long as the name starts with 0001, it doesn't matter what follows, such as:

Name

0001_101 Digital Sound Effects Vol. 2- Sounds Of Horror - 09 - Man Screams.wav

The relay will turn on (connecting the common (C) and the normally open (NO) contacts) whenever the unit is triggered and it is playing back the "interruption" track. The relay will turn off (connecting the common (C) and the normally closed (NC) pins) whenever the main track is playing. LED D12, mounted on the board right above the relay, will light up indicating when the relay is on.

The DELAY knob, can be turned clockwise to add a delay of 1 to 10 seconds before the unit can be retriggered. During the delay LED D6 (just to left of the SW TRIG header) will blink once for each second it is in delay. In this mode, it will cause a delay after the "interruption" track is played, causing it to have a pause before starting to play the main track again.

Thank you for buying a Cowlacious Designs product!

Cowlacious Designs

420 Rawl Rd.

Lexington, SC 29072

(775) 741-1086

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