Choir Board

Cowlacious Designs™
By Computer & Electronic Services

# Index:

Introduction:

The Choir Board provides eight channels of audio that all play at the same time, via four stereo MP3/WAV playback modules. A relay also turns on during the playback time, which can be used to turn on a light or trigger other devices.

For each stereo MP3/WAV playback module there are three output jacks. One jack can be set to standard stereo mode, left audio on both channels, or right audio on both channels. This allows control of the audio out to an amplifier connected to the jack. The other two jacks always receive the standard stereo signal and are designed to drive ST-425 boards or our Sound Switch board, which allow the audio channel to be chosen at that respective board.

Board Dimensions
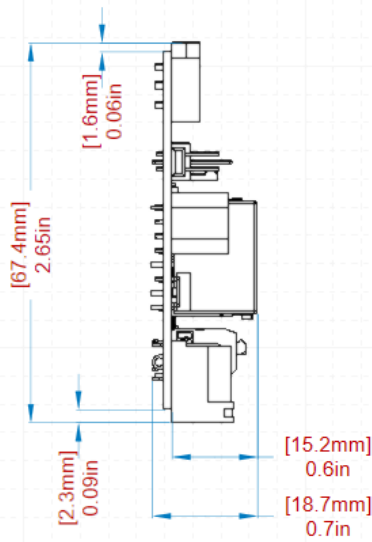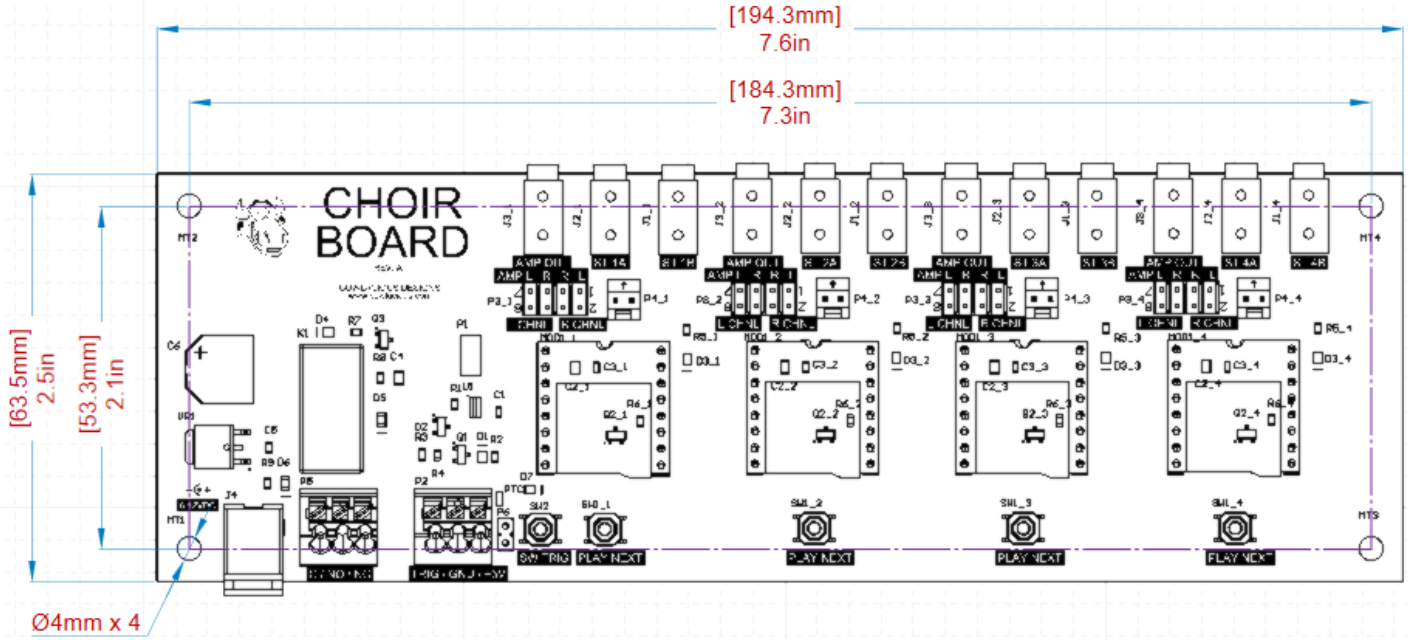
Choir Board Overview
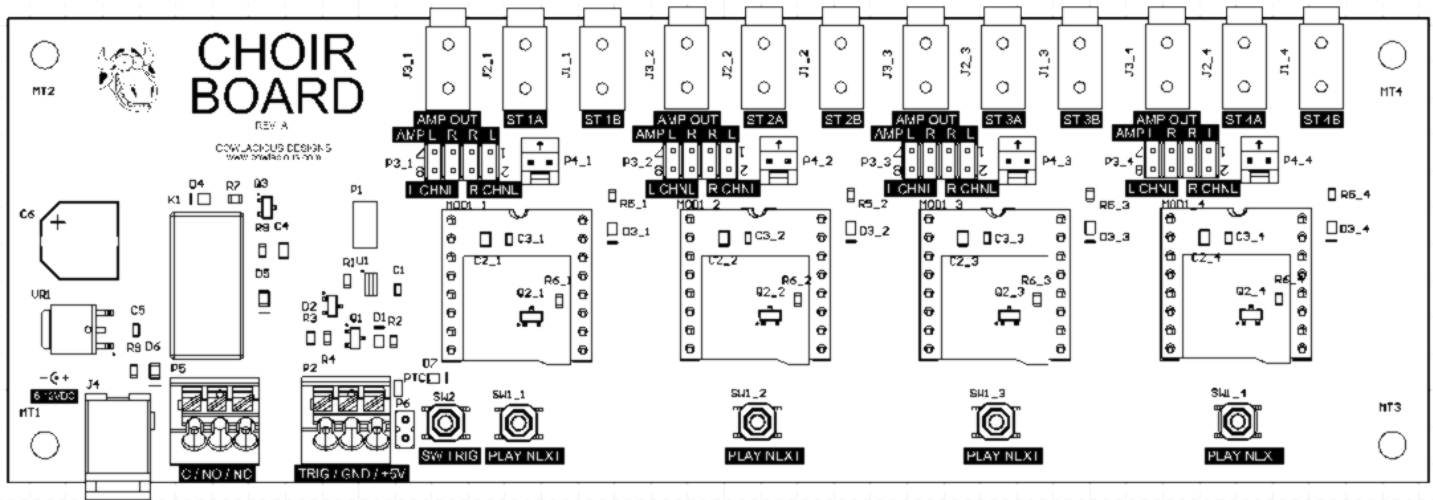
J4 Power Jack 6-12VDC (center positive).

J3_1 through J3_4, stereo output jacks with selectable stereo, left, or right channel output.

J2_1 through J2_4, Scary Terry output channels 1A.

J1_1 through J1_4, Scary Terry output channels 1B.

P5 Relay output connections.

P2 Trigger input connections. Triggers playback of the next track on all of the audio modules at the same time. A Switch, motion sensor, or other device can be connected here.

P6 Standard switch trigger connection. Triggers playback of the next track on all of the audio modules at the same time.

SW2 switch trigger (switch connected across P6 for testing purposes).

P4_1 through P4-4, 3W mono output jack. A small speaker can be connected to these jacks to hear mono output from the modules.

SW1_1, when pressed, plays the next audio file on the MOD1_1 audio module. This is mainly used for quick testing of the audio on the module.

SW1_2, when pressed, plays the next audio file on the MOD1_2 audio module. This is mainly used for quick testing of the audio on the module.

SW1_3, when pressed, plays the next audio file on the MOD1_3 audio module. This is mainly used for quick testing of the audio on the module.

SW1_4, when pressed, plays the next audio file on the MOD1_4 audio module. This is mainly used for quick testing of the audio on the module.

D6, Power LED.

D5, Relay "On" LED.

Sound module control

Trigger connection: When triggered the device will play the "next" audio file. It will play the same audio file each time if there is only one audio file on the microSD card. If there are multiple audio files it will play them in the order they were added to the microSD card.

The trigger can be controlled by a switch, motion sensor, or voltage level (up to 24VDC).

If a shorting jumper is placed across the P6 switch header, the unit will start playing as soon as it is powered up. It will continue to play each track, one after the other, until the jumper or power is removed. If there is only one track on each module then it will play that same track over and over. If space is wanted between playback you can either add a track of "dead air" for the length of time you want between each track or you can add "dead air" to the end of each individual track using audio editing software. **Remember, the modules playback the tracks in the order they are dragged to the microSD card!**

Note: For the board to work properly, all the modules must have a microSD card installed. If a module is not needed and you don't want to put a microSD card in it, then the module should be gently removed by lifting it up and out of its sockets on the board.
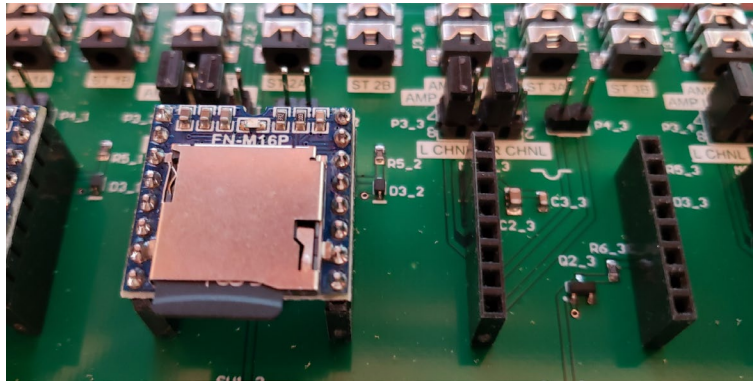
Photo showing module in socket and socket without a module.

If a module doesn't have microSD and the unit is triggered, it will play the first track of audio, on all the units that have microSD cards with tracks on them, and then the board will appear to lock up and won't allow the unit to be retriggered, this is because the unit(s) without the microSD card appears to the system as still playing audio, even though it isn't, and the unit can't be retriggered until all audio playback is over.

Each card should have audio files of the same length (even if some of them just have dead air for a time).

For a switch – Connect the "5V" pin on the trigger jack to one terminal of a switch, then connect the other terminal trigger connections "Trig" terminal. Pressing the switch will then play the next audio file on the µSD card in the sound player module.

For a motion sensor – Connect the "5v", "Gnd", and "Trig" to the equivalent pins on the motion sensor, such as our ACCY-MS-WDANG motion sensor. This will trigger the sound player module whenever motion is detected.

About the 5V terminal - The "5V" terminal can supply a maximum of 29mA. Anything above 29mA of current draw will cause a self-resetting fuse to open and cut off the power to the pin. You should use an external power supply to power your triggering device if it requires more current.

Preparing Audio for the Modules

A free audio editor can be found at www.audacity.sourceforge.net that allows you to edit and mix your audio files.

All sets of tracks that play together should be of the same length. The length of each set can certainly be varied.

Tracks 1 and 2 of the audio should be output as a stereo wave or MP3 file, stored to a microSD card and placed in module MOD1_1.

Tracks 3 and 4 of the audio should be output as a stereo wave or MP3 file, stored to a microSD card and placed in module MOD1_2.

Tracks 5 and 6 of the audio should be output as a stereo wave or MP3 file, stored to a microSD card and placed in module MOD1_3.

Tracks 7 and 8 of the audio should be output as a stereo wave or MP3 file, stored to a microSD card and placed in module MOD1_4.

Specifications of components on the board

Relay (K1)
Contact form: SPDT (1 Form C)
Switching voltage: 277VAC, 30VDC – Max
Contact current rating: 5A

Relay connection terminals (P5)
Contact voltage: 300V Max
Contact current: 2A Max
Wire gauge: 20-26 AWG

Trigger connection terminals (P2)
Contact voltage: 300V Max
Contact current: 2A Max
Wire gauge: 20-26 AWG

Power Jack (J4)
Power Barrel Connector Jack 2.10mm ID (0.083"), 5.50mm OD (0.217"). Use a center positive power supply.

Mono Speaker Out Jack (P4_1 through P4_4)
Maximum mono output from the module is 3W. Use the AMP OUT jack(s) and an external amplifier if stereo sound or more amplification is needed.

Audio Module Specs (not all features are implemented in this design)
MP3 Audio Format

- Supports 11172-3 and ISO13813-3 layer3 audio decoding.
- Supports sampling rate (KHZ):8/11.025/12/16/22.05/24/32/44.1/48.
- Supports MP3 and WAV decoding.
- Supports FAT16 and FAT32 file system.
- 24-bit DAC output and supports dynamic range 90dB and SNR 85dB.
- Supports maximum 32GB micro SD.
- Supports maximum 3000 audio files under the root directory of the storage device.
- Supports maximum 99 folders, and each folder can stores 255 audio files.
- Built-in a 3 watts amplifier that can direct drive a 3 watt speaker.
- 30 levels adjustable volume.

Computer & Electronic Services
Cowlacious Designs
420 Rawl Rd
Lexington, SC 29072
775-741-1086
www.cowlacious.com