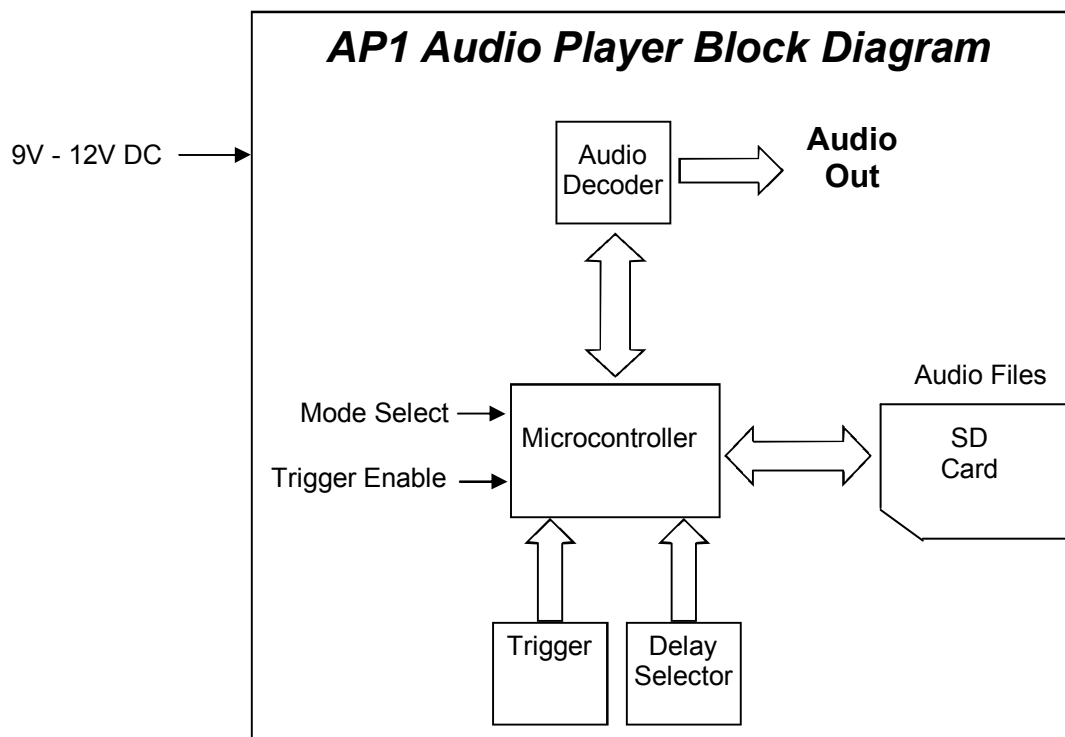


## ***User's Guide for the AP1 Audio Player***

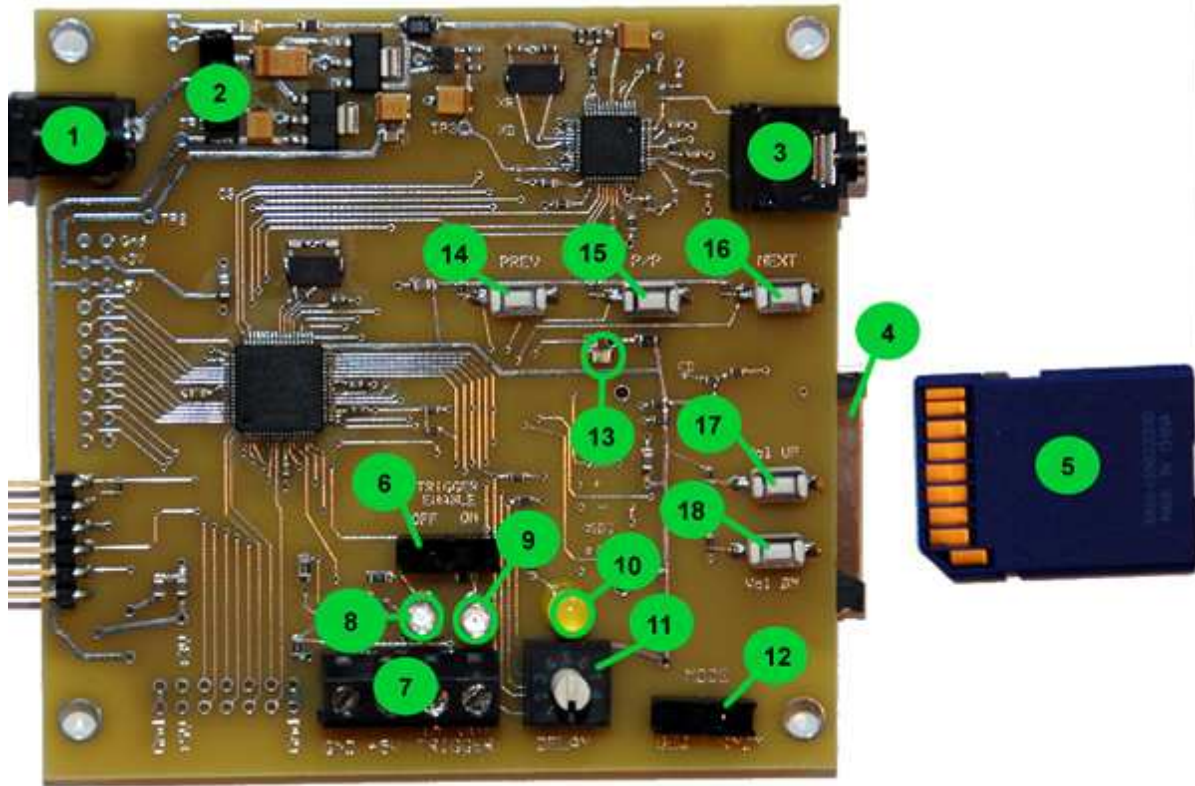
Thank for your purchase of the AP1 Audio Player. This player was designed specifically to provide high quality audio for home and professional prop systems.

### **System Features**

- 1/4" audio jack out for connection to headphones, powered speakers or amplifier
- Plays mp3 or Ogg Vorbis audio files
- Audio files stored in SD card
- Audio tracks can be triggered from 3.3V - 5V input signal
- 5V output trigger while audio track is playing for controlling other devices
- Programmable "post trigger" delay after audio track finishes from 5s to 5 min
- Indicator LEDs to show trigger in, trigger out and delay



**AP1 Board Layout and basic functions**



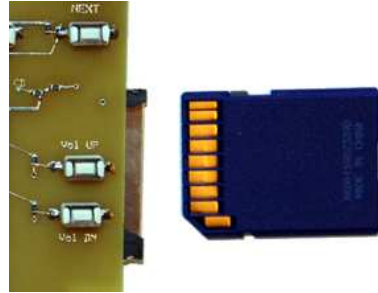
- 1 - Power connector (9-12V DC)
- 2 - Power switch
- 3 - Audio connector (1/8" Stereo jack)
- 4 - SD card connector
- 5 - SD card (not included)
- 6 - Trigger Enable Switch
- 7 - Trigger in/out connector
- 8 - LED indicator for Trigger In
- 9 - LED indicator for Trigger Out
- 10 - LED indicator for Post cycle delay
- 11 - Post cycle delay selector switch
- 12 - Operational mode selector switch
- 13 - LED indicator for SD card access
- 14 - Previous track button
- 15 - Play/Pause button
- 16 - Next track button
- 17 - Volume up button
- 18 - Volume down button

## **Powering the Board**

The AP1 requires a 9V - 12V DC supply.

## **SD Card and Audio Files**

The AP1 uses audio tracks stored on a standard SD card formatted as either FAT16 or FAT32. Only audio tracks that are formatted as mp3 or Ogg Vorbis are supported by the board. All files must be in the root directory of the SD card i.e., audio files in sub-directories will not be recognized by the player. Please read the section on choosing Random Mode or Sequential Mode for the player as this effects the naming convention for your audio files. Insert the card as shown in the photo to the right.



## **Buttons**

Buttons on the player exist for the following functions:

### Volume up

Each press of the button will increase the volume a small amount. Upon power-up the volume will be reset to a nominal value

### Volume down

Each press of the button will decrease the volume a small amount. Upon power-up the volume will be reset to a nominal value.

### Previous Track (PREV)

If an audio track is currently playing when this button is pressed then it will jump to the previous track and begin playing. If the track currently playing is the first audio track, then it will jump to the beginning of the track. If an audio track is not playing when this button is pressed then it will jump to the previous track and wait for either the Pause/Play button to be pressed or a valid trigger.

### Pause/Play (P/P)

If the player is not currently playing an audio track, pushing the P/P button will cause the player to begin playing the current audio track. Once this track finishes playing then the next track will be loaded but will not start playing unless the P/P button is pressed again or if the triggered by the trigger signal. If the player is currently playing a track when the P/P button is pressed then it will pause the audio track at the current position until the P/P is pressed again.

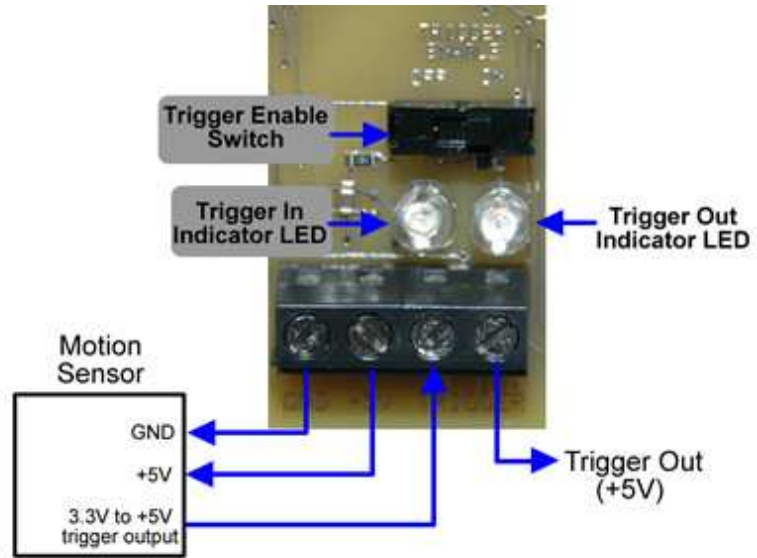
### Previous Track (NEXT)

If an audio track is currently playing when this button is pressed then it will jump to the next track and begin playing. If the track currently playing is the last audio track, then it will "roll around" to the first audio track and begin playing. If an audio track is not playing when this button is pressed then it will jump to the next track and wait for either the Pause/Play button to be pressed or a valid trigger.

### Trigger Section

The trigger section of the AP1 is shown in the photo to the right. This section allows you to connect a sensor to the board and the sensor will indicate to the AP1 board that it should begin to play an audio track.

The 4-position connector in the bottom of the photo is where you will connect your sensor. The position on the left is for the ground connection, the second from the left is a 5V output to power your sensor if needed.



The third position on the connector is for the trigger input signal from the motion sensor. A voltage of 3.3V to 5V on this terminal will 'trigger' the board. The **Trigger In Indicator LED** will light up anytime the trigger signal is above this threshold.

The **Trigger Enable Switch** allows you to disable the trigger signal from actually causing the player to play an audio track. If the Trigger enable switch is in the 'On' position then an input signal will cause a trigger and if the switch is in the 'Off' position then no triggers will be acted upon. This may be useful in situations where you are testing your system and do not necessarily want an audio track to play every time a trigger signal is present. Note that this switch simply prevents the trigger signal from making the board play an audio track - it will however continue light up the Trigger In LED when the trigger input is high. Please read the section on the next page that discusses the function of the post cycle delay feature and how the post cycle delay can be used to determine how often the board actually responds to a trigger input.

The **Trigger Out connection** will provide a +5V signal whenever the player has been triggered by the trigger input the audio track is playing. This connection will remain high as long as the audio track plays and will go low as soon as the track completes. This output is meant to be used as a control signal to other devices such as lights or motion controllers while the audio track is playing. Whenever the Trigger Out connection is high, the **Trigger Out Indicator LED** will turn on as well. Note that if the Trigger Enable switch is in the 'Off' position, a valid trigger input will never be received by the board and the Trigger Out connection will never go high.

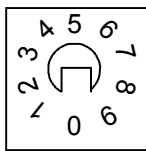
## Setting the Post Cycle Delay

The post cycle delay feature allows you to set the delay period after an audio track plays before another trigger is accepted. The post cycle delay cannot be turned off - the feature is always enabled and the delay time can be changed from 5 sec to 5 min. The longer delay times are typically used in situations where multiple triggers are occurring in a short period of time (such as people continuously walking past the sensor) and you want the audio player to wait a certain amount of time before it plays the next audio track. Once some people realize that a sensor has caused something to happen they may be compelled to attempt to make the trigger go off multiple times - which you may find annoying to you and/or your neighbors. Using a post cycle delay of 30 sec or more usually takes care of this issue.

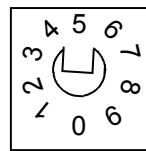


The post cycle delay is set using the rotary dip switch on the player board as shown in photo on the right. The switch can be turned to one of 10 positions to set the delay as shown below.

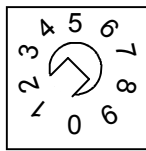
The LED indicator above the switch will go on after an audio track has finished and will stay on as long as the delay period is in effect. During this delay period no other triggers will be accepted.



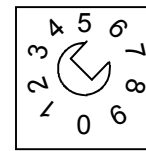
Delay indicator = 0  
Delay time = 5 sec



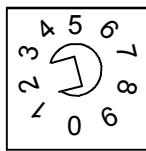
Delay indicator = 5  
Delay time = 60 sec



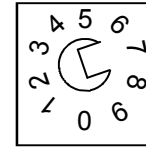
Delay indicator = 1  
Delay time = 10 sec



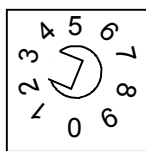
Delay indicator = 6  
Delay time = 90 sec



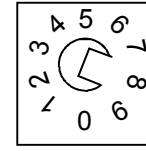
Delay indicator = 2  
Delay time = 15 sec



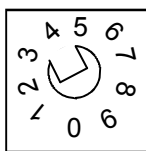
Delay indicator = 7  
Delay time = 2 min



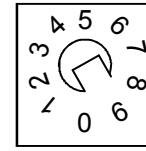
Delay indicator = 3  
Delay time = 30 sec



Delay indicator = 8  
Delay time = 4 min



Delay indicator = 4  
Delay time = 45 sec

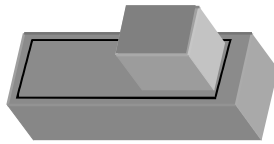


Delay indicator = 9  
Delay time = 5 min

## **Choosing Between Random Mode and Sequential Mode**

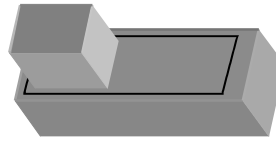
The AP1 operates in one of two operational modes—Random Mode and Sequential Mode. The mode is selected using the Mode Select switch on the board.

**Selecting Random Mode**



SEQ      RNDM

**Selecting Sequential Mode**



SEQ      RNDM

### **Random Mode**

When random mode is chosen, the AP1 does not care what the filenames are for any audio track as long as the tracks are either in mp3 or Ogg Vorbis format. Each time the player is triggered a random track is played. After the track finishes, another random track is chosen and it will wait for the next trigger. There is a filter to prevent the same track from being played twice in a row. There is technically no limit on the number of audio tracks you can have when are operating in this mode. If you are having problems getting the player to work for some reason we suggest you start with the random mode being selected.

### **Sequential Mode**

When operating in sequential mode each audio track will be played in order, however, the filename of each audio track must be formatted correctly for it to play in this mode. WHEN IN SEQUENTIAL MODE ONLY AUDIO FILES THAT BEGIN WITH A 2-DIGIT NUMBER BETWEEN 1 AND 99 WILL PLAY. TRACKS LESS THAN 10 MUST HAVE A LEADING ZERO. If you do not have any audio files that begin with a 2-digit number then no tracks will play when the board is triggered. In addition, sequential mode limits you to 99 files. The files must begin with a number between 1 and 99 although there can be spaces between the numbers, ie., you can have a filename that starts with 01 and then the next filename starts with 07.

Examples of valid filenames:

01myintro.mp3

07\_part7.mp3

99\_screams.ogg

Examples of filenames that are NOT valid in Sequential Mode:

Myintro.mp3                      *(file does not begin with 2 digit number)*

7\_screams2.mp3                  *(filename begins with only one digit– must have 2 digits)*