



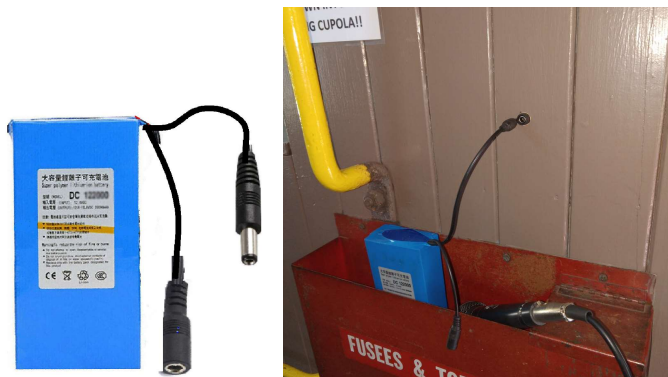
PA System on the train 1/8/24

Overview

To operate the system, plug in the 12-volt battery pack to the system in the caboose, 308. The system runs autonomously!

The battery pack is charging on the desk in the yard office.

When the GPS receiver acquires lock to the satellites the system will beep three times.



At the end of the day, return the battery pack to the Yard Office and connect to the charger.

Make sure the **switch** is **ON**.
It will not charge if the switch is off.

The system has been updated to run automatically. When the GPS receiver acquires lock to the satellites the system will beep. It will play sound tracks before the train has departed and provide information to our passengers about our railroad and museum as the train travels to New Hill. The microphone can be used for live announcements. The system has been installed in caboose 308.



Details:



The system is powered by a 12-volt 20-amp hr. lithium battery. The battery feeds the amplifier and a buck regulator set to 5 volts to power the Raspberry Pi GPS system. Raspberry Pi audio output is fed to the MIC 2 input of the mixer through an isolation transformer. The transformer filters the power supply noise from getting into the audio.

The amplifier generates a 70 volt audio signal which is distributed to all of the passenger cars on the train.

Before the train leaves the station, the system plays four announcements at 15, 10, 5 and 1 minute prior to the scheduled departure time.



During the train ride, the system plays several audio announcements at points along the route based of the GPS coordinates of the train' position.

The audio file and the procedures for determining when they are played are stored in the Raspberry Pi computer.

The scheduled departure times are derived from the annual schedule of all of the train rides. The Despatcher's Report EXEL workbook, 2023 Trains, contains a workbook by the same name. This 2023 Trains workbook needs to be saved as a comma separated value file named schedule.csv.

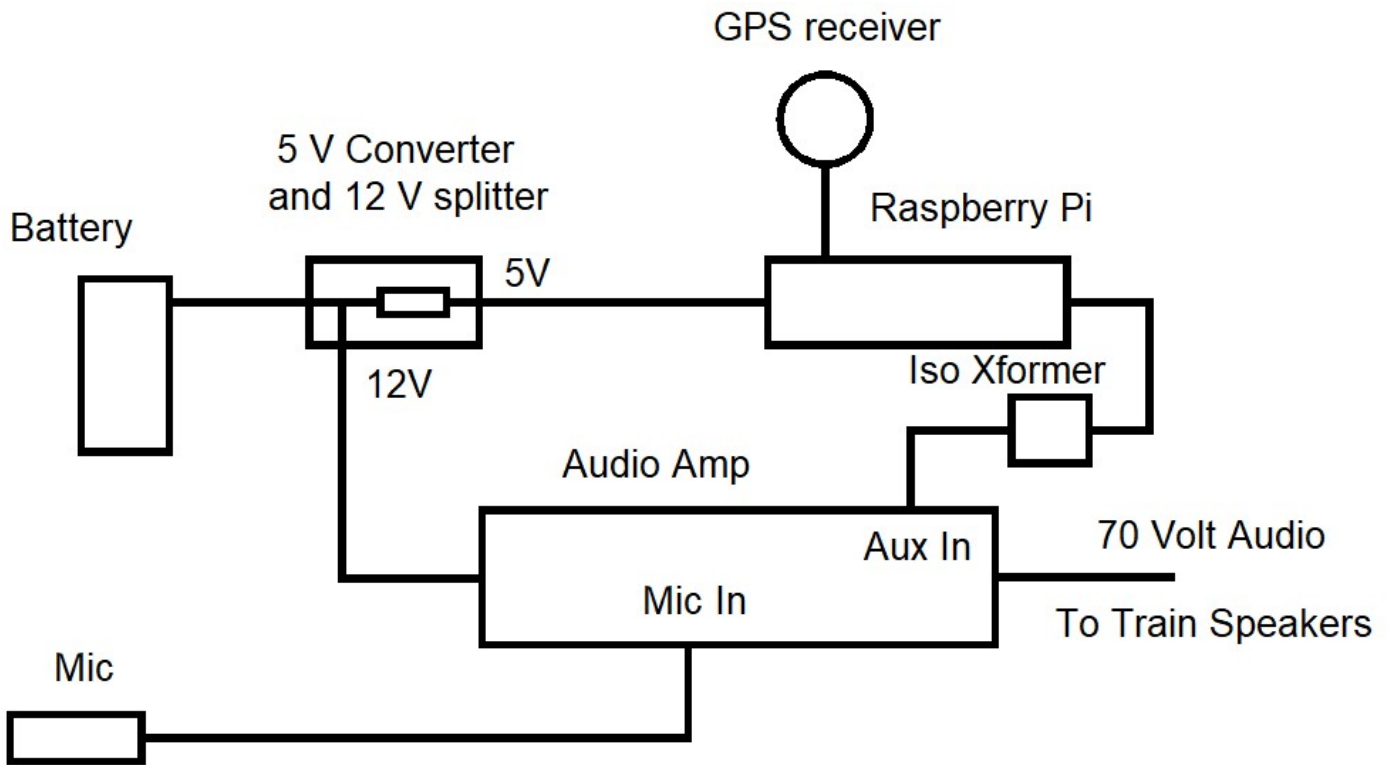
The GPS coordinates used when the train is moving are derived from another EXEL file with the name **gps-data.csv**. This file contains the location latitudes, file names, directions and volume levels. For details on this part of the system see:

https://wedcrew.yolasite.com/resources/GPS_system_Description.pdf, appendix 13

Hardware:

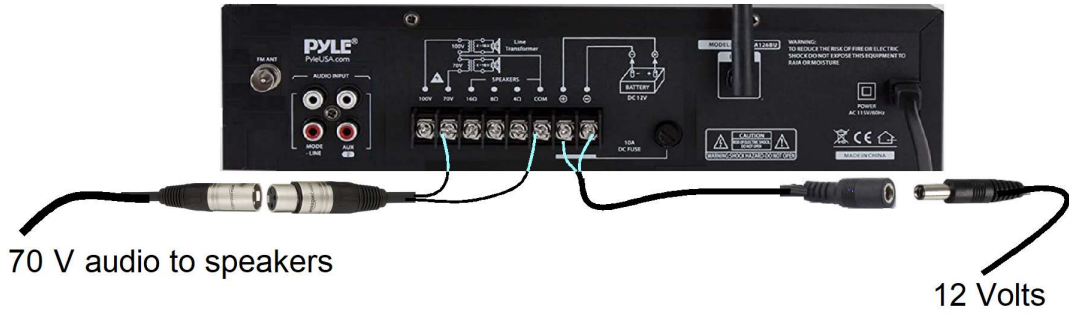
12-volt, 2 amp-hr. battery
5-Volt Buck regulator with custom cables
Audio Amplifier
GPS receiver

Raspberry Pi computer
Microphone
Interconnection cables
Custom Audio cable with isolation transformer

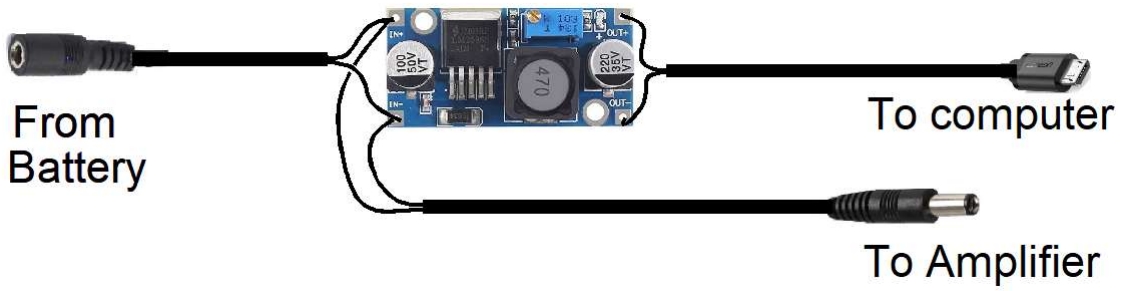


Block Diagram





12 Volt splitter and 5 volt regulator



To Raspberry Pi Audio out

