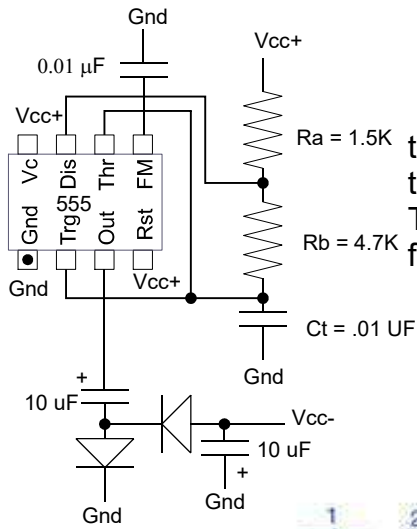


Note: MAX3232 is an easier solution to converting to and from RS-232 I used the MC1488 because I had several in my parts bin.

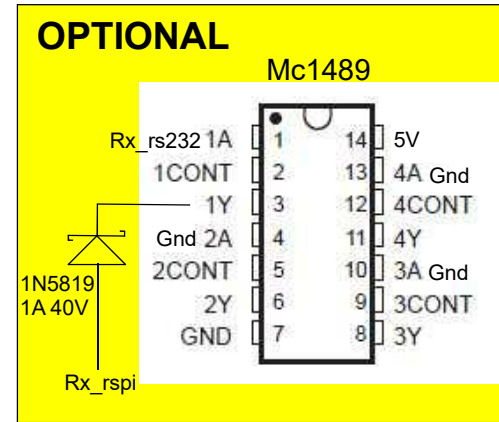
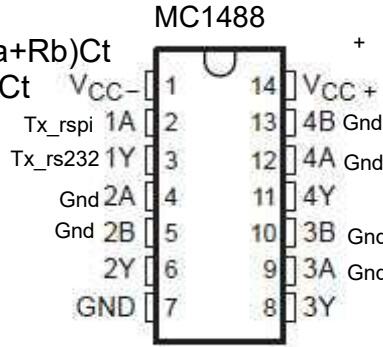


$$t1 = 0.693(Ra+Rb)Ct$$

$$t0 = 0.693RbCt$$

$$T = t1+t0$$

$$f = 1/T$$



negative voltage supply for RS-232

NOTE: May want to use a better Vcc- supply for RS-232. Some times the RS-232 link does not work.

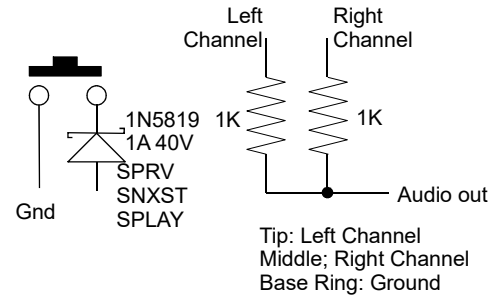


Raspberry Pi B Rev 2 P1 GPIO Header

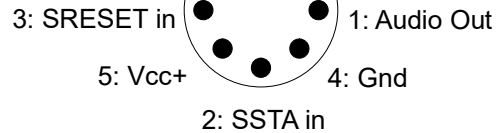
Pin No.	Pin No.	Pin No.	Pin No.
3.3V	1	2	5V
GPIO2	3	4	5V
GPIO3	5	6	GND
GPIO4	7	8	GPIO14
GND	9	10	GPIO14
GPIO17	11	12	GPIO18
GPIO27	13	14	GND
GPIO22	15	16	GPIO23
3.3V	17	18	GPIO24
GPIO10	19	20	GND
GPIO9	21	22	GPIO25
GPIO11	23	24	GPIO8
GND	25	26	GPIO7

Key	UART
Power +	UART
GND	SPI
IC	GPIO

GPIO pins
Play: Red
NC
next: Black
prev: White



5 Pin DIN Female Connector



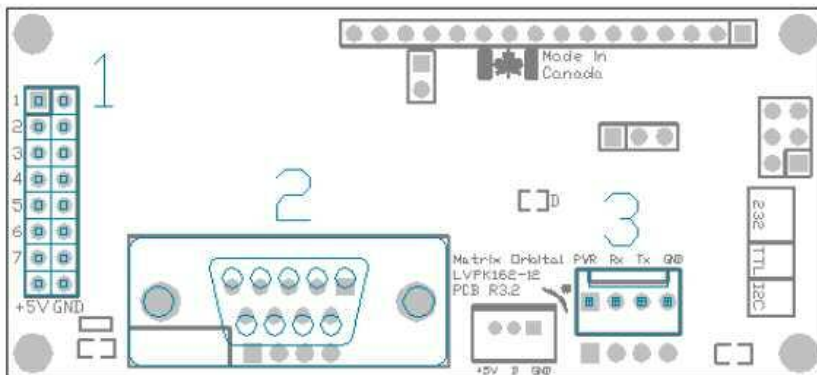
Vcc+ is between 9 and 12 volts

```
#define GPIO_SPRV 27 // pin 13 - Previous pushbutton (GPIO 21 for early RP)
#define GPIO_SNXT 17 // pin 11 - Next pushbutton
#define GPIO_SPLAY 4 // pin 7 - Play pushbutton
#define GPIO_SSTA 23 // pin 16 - NOMA Station pushbutton
#define GPIO_SRESET 25 // pin 22 - RESET pushbutton
```

// The above port and pin assignments appear to be consistent among the various Raspberry Pi models

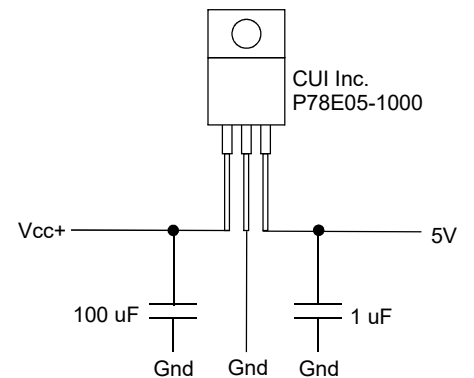
// GPIO 14 - pin 8 (TxD)
// GPIO 15 - pin 10(RxD) are for SUART
// Have also seen GPIO 15 and 16 for the above pins

// PINS 2 and 4 are +5V PIN 6 is ground
// PIN 2 is at corner of PI board

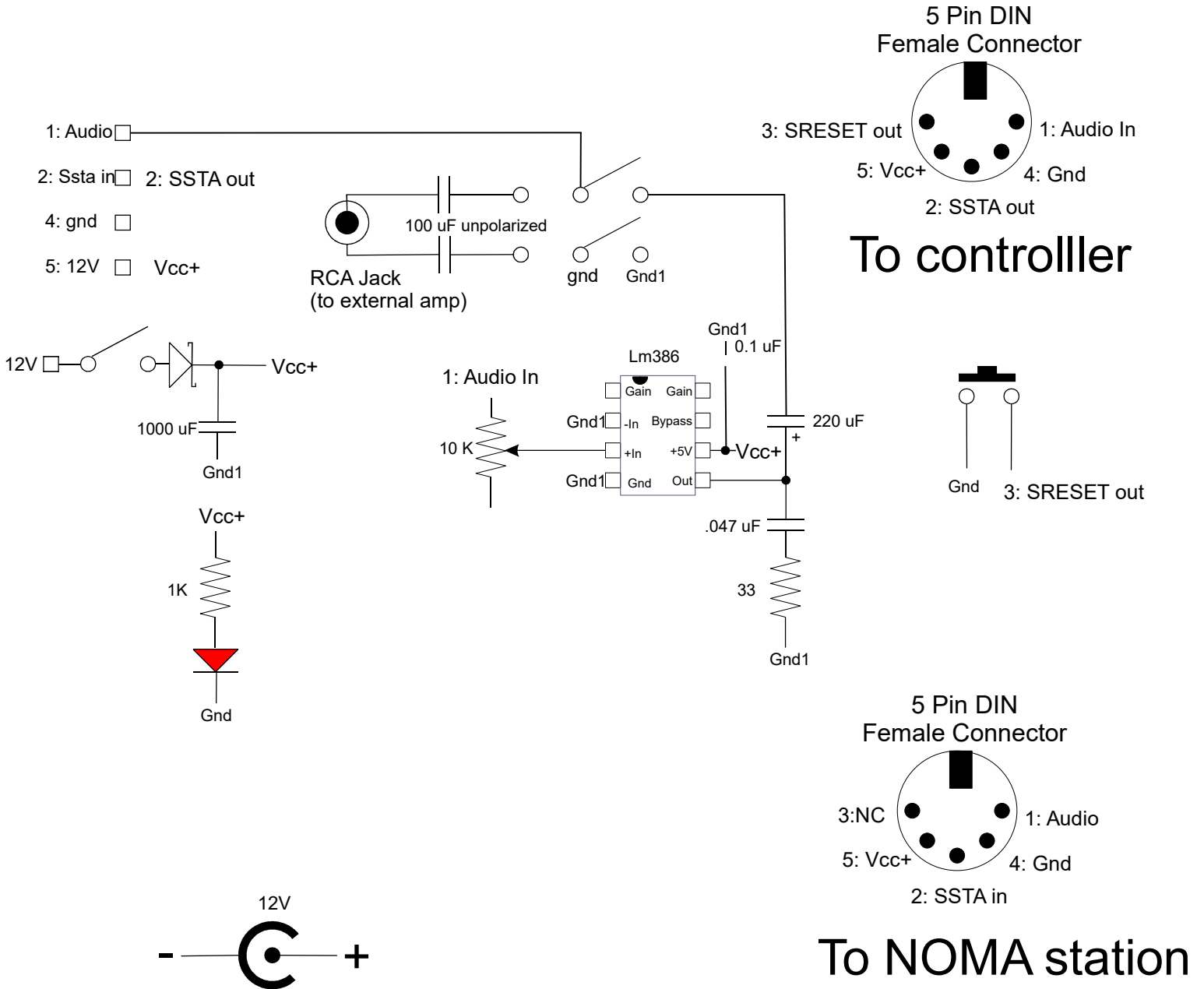


LK162-12-WB-C166 Display
Jameco 2135638

PWR -> 5V - Red
Rx -> Tx_rs232 - Black
Tx -> Rx_rs232 - Black
GND -> gnd - Yellow

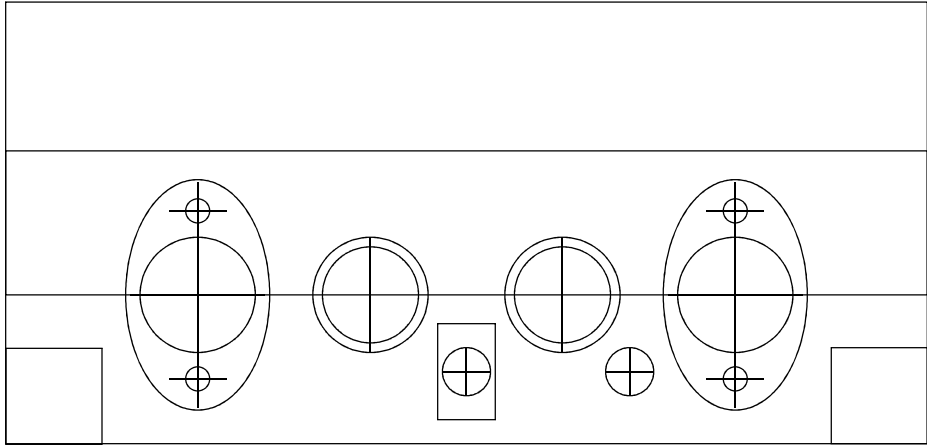


NOMA Station Sound
Norbert Doerry
May-June 2020
Rev 1: Oct 2020



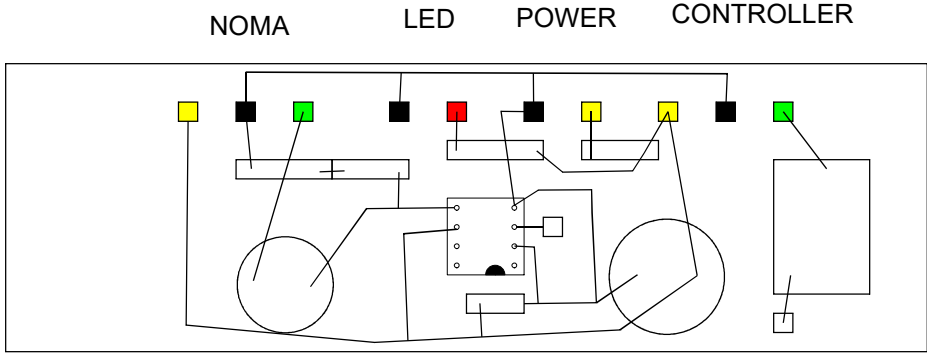
Rev 1 Note: The Lm386 did not amplify enough – added RCA out Jack to enable use of external amplifier

NOMA Station Sound
 Norbert Doerry
 May-June 2020
 Rev 1: Oct 2020

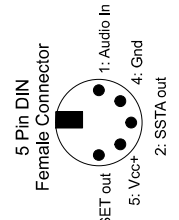


NOMA RESET POWER CONTROLLER

NOMA RESET POWER CONTROLLER



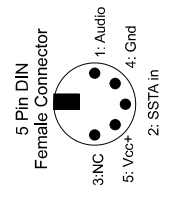
NOMA LED POWER CONTROLLER



To controller

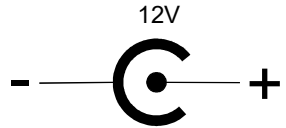
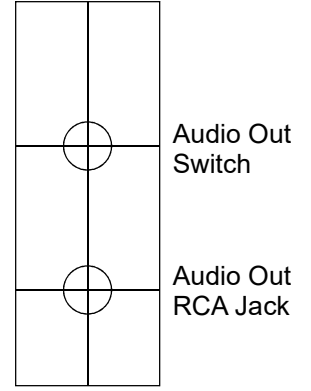


NHD
June 2020

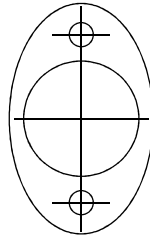
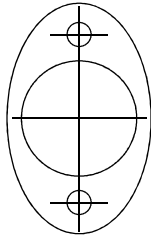


To NOMA station

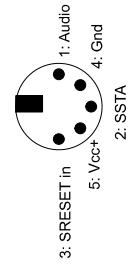
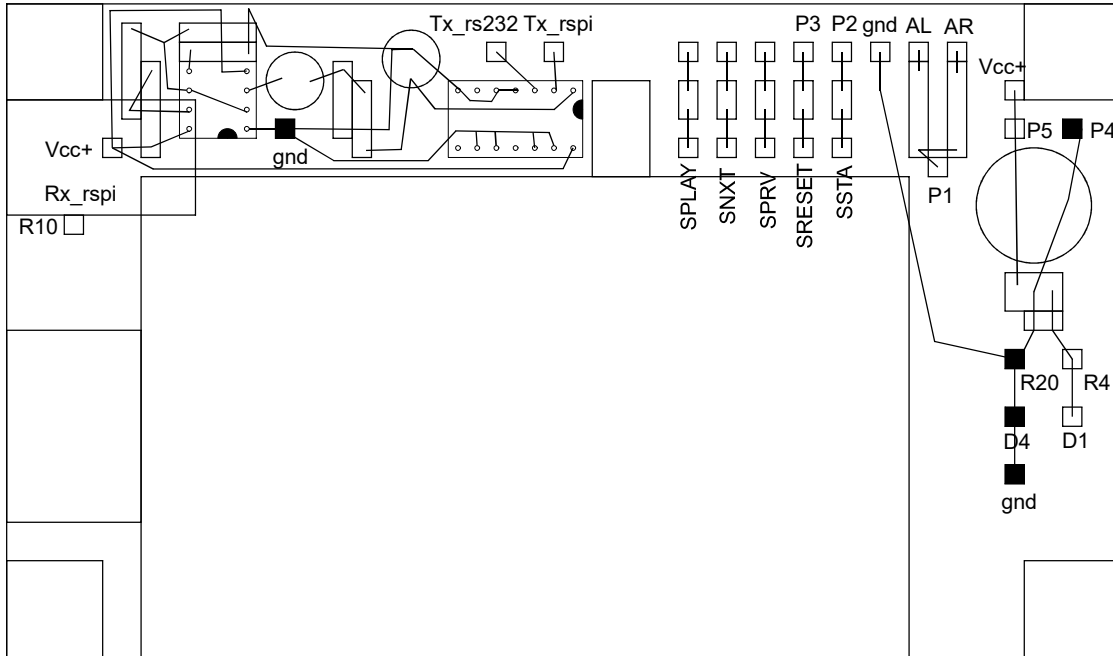
Side of Box



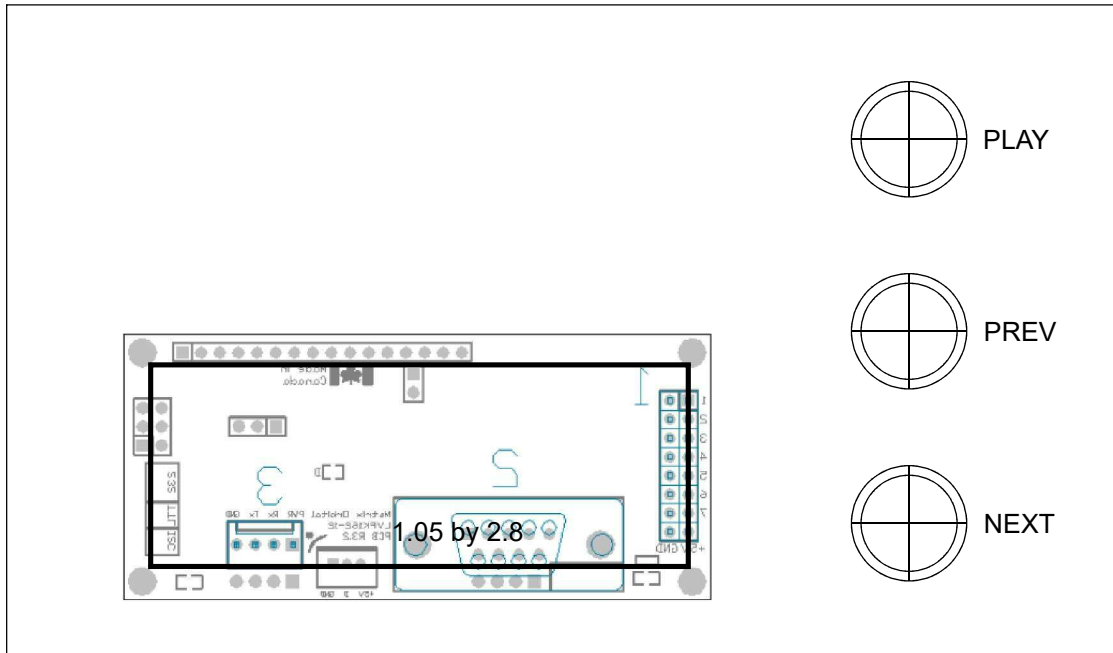
NOMA Station Sound
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D2 R8



NOMA STATION
 NORBERT DOERRY
 JUNE 2020



NOMA Station Sound
 Norbert Doerry
 May-June 2020