

Functional Blocks	Component Description	Needed for PCB Layout	Quantity	Manufacturer Part #	Manufacturer	Part Cost	Order Link	MechE Consideration
MCU	MCU from Arduino Uno	no		1 ATMEGA328P-PU	Sparkfun	\$4.30	https://www.sparkfun.com/products/9061	
	0.1uF cap	yes		2 C1206C104J3RACTU	KEMET	\$1.20	https://www.digikey.com/product-detail/en/kemet/C1206C104J3RACTU/399-11180-1-ND/4357909	
	Socket for the MCU	yes		1 PRT-07942	Sparkfun	\$0.95	https://www.sparkfun.com/products/7942	
	16MHz Crystal	yes		1 ABM7-16.000MHZ-D2Y-T	Abrakon LLC	\$0.72	https://www.digikey.com/product-detail/en/abracon-llc/ABM7-16.000MHZ-D2Y-T/535-9840-1-ND/2001463	
	1M0hm resistor	yes		1 CRCW08051M00FKEA	Vishay Dale	\$0.10	https://www.digikey.com/product-detail/en/vishay-dale/CRCW08051M00FKEA/541-1.00MCCT-ND/1181127	
	22pF caps	yes		2 CC0805FRNP09B220	Yageo	\$0.25	https://www.digikey.com/product-detail/en/yageo/CC0805FRNP09B220/311-4171-1-ND/8025260	
Battery/PMU	Li-Po	no		1 354	Adafruit	\$19.95	https://www.adafruit.com/product/354	
	Battery Charger IC	no		1 2465	Adafruit	\$19.95	https://www.adafruit.com/product/2465	
Alarm	Battery Charger	no		1 1995	Adafruit	\$7.50	https://www.adafruit.com/product/1995	
	Speaker	no		1 SP500208-3	DB Unlimited	\$6.37	https://www.digikey.com/product-detail/en/db-unlimited/SP500208-3/2104-SP500208-3-ND/9990622	
	2-pin Speaker Connector	yes		1 530470210	Molex	\$0.19	https://www.digikey.com/product-detail/en/molex/530470210/WM1731-ND/242853	
	100Ohm resistor	yes		1 TNPW1206100RBEEN	Vishay Dale	\$0.93	https://www.digikey.com/product-detail/en/vishay-dale/TNPW1206100RBEEN/541-3833-1-ND/7355192	
	1M0hm resistor	yes		1 TNPW12061M00BEEN	Vishay Dale	\$1.78	https://www.digikey.com/product-detail/en/vishay-dale/TNPW12061M00BEEN/541-3848-1-ND/7355207	
	N-channel MOSFET	yes		1 BUK962R8-60E	Nexperia USA Inc.	\$2.42	https://www.digikey.com/product-detail/en/nexperia-usa-inc/BUK962R8-60E/118/1727-1096-1-ND/4031798	
Communication	Flyback Diode	yes		1 PMEG2010AEH	Nexperia USA Inc.	\$0.48	https://www.digikey.com/product-detail/en/nexperia-usa-inc/PMEG2010AEH/115/1727-3856-1-ND/1589927	
	NFC	no		1 113020006	Seed Studio	\$21.50	https://www.seedstudio.com/Grove-NFC-p-1804.html	
	4.7kOhm resistors	yes		2 CRCW12064K70FKEA	Vishay Dale	\$0.20	https://www.digikey.com/product-detail/en/vishay-dale/CRCW12064K70FKEA/541-4.70KFCT-ND/1181836	
	Grove 4-pin female splitter	no		1 B01EX9LTMQ	ZIYUN	\$9.92	https://www.amazon.com/ZIYUN-Grove-Female-Jumper-Conversion/dp/B01EX9LTMQ	
	Bluetooth	no		1 2479	Adafruit	\$17.92	https://www.adafruit.com/product/2479	
	Solenoid	no		1 DS-0420S	Dowsonol	\$7.99	https://www.amazon.com/Electromagnet-Solenoid-Spring-Cabinet-Special/dp/B075H5WDD1/ref=sr_1_2?keywords=solenoid+5V+5mm&qid=1571700646&sr=8-2	
Lock/Unlock Mechanism	100Ohm resistor	yes		1 TNPW1206100RBEEN	Vishay Dale	\$0.93	https://www.digikey.com/product-detail/en/vishay-dale/TNPW1206100RBEEN/541-3833-1-ND/7355192	
	1M0hm resistor	yes		1 TNPW12061M00BEEN	Vishay Dale	\$1.78	https://www.digikey.com/product-detail/en/vishay-dale/TNPW12061M00BEEN/541-3848-1-ND/7355207	
Cord-Cut Detection	N-channel MOSFET	yes		1 BUK962R8-60E	Nexperia USA Inc.	\$2.42	https://www.digikey.com/product-detail/en/nexperia-usa-inc/BUK962R8-60E/118/1727-1096-1-ND/4031798	
	Flyback Diode	yes		1 PMEG2010AEH	Nexperia USA Inc.	\$0.48	https://www.digikey.com/product-detail/en/nexperia-usa-inc/PMEG2010AEH/115/1727-3856-1-ND/1589927	
Status	Nothing - can be accomplished via pins on the Arduino. Output LOW and configure the input to read it with the built-in pull-up enabled; when the cord is cut, the input pin will go HIGH and trigger the alarm. It will then turn to a normal input (high impedance) so that the pin is not shorted.							
	LED Ring	no		1 1643	Adafruit	\$7.50	https://www.adafruit.com/product/1643	
Male Headers	1000uF cap	yes		1 TPMV108M006R0020	AVX Corporation	\$8.02	https://www.digikey.com/product-detail/en/avx-corporation/TPMV108M006R0020/478-5753-1-ND/2136345	
	0ohm resistor	yes		1 RC1206JR-070RL	Yageo	\$0.10	https://www.digikey.com/product-detail/en/yageo/RC1206JR-070RL/311-0.0ERCT-ND/732131	
	8-pin male headers	no		1 116	Sparkfun	\$1.50	https://www.sparkfun.com/products/116	
			Total # of PCB Components			\$145.43		
			18					
<i>Not on PCB but here if necessary. Spec'd out boost converters (thought to be needed for full speaker output, but these were not needed since we found a better speaker later.</i>								
9V Boost Converter Components								
	Quantity	Part Number	Manufacturer	Cost	Order Link			
9V Boost Converter	1	TPS61085PWR	Texas Instruments	\$1.95	https://www.digikey.com/product-detail/en/texas-instruments/TPS61085PWR/296-23551-6-ND/1880998			
10uF Cap	3	CGA5L1X7R1E106K160AC	TDK Corporation	\$1.98	https://www.digikey.com/product-detail/en/tdk-corporation/CGA5L1X7R1E106K160AC/445-6990-1-ND/2673008			
1uF Input Cap	1	885012208036	Würth Electronics Inc	\$0.15	https://www.digikey.com/product-detail/en/wurth-electronics-inc/885012208036/732-7892-1-ND/5454319			
3.3uH Inductor	1	DFE322520FD-3R3M=P2	Murata Electronics	\$0.91	https://www.digikey.com/product-detail/en/murata-electronics/DFE322520FD-3R3M=P2/490-18406-1-ND/10135417			
Diode Rectifier	1	PMEG2010AEH	Nexperia USA Inc.	\$0.48	https://www.digikey.com/product-detail/en/nexperia-usa-inc/PMEG2010AEH/115/1727-3856-1-ND/1589927			
113kOhm Resistor	1	ERA-8AEB1133V	Panasonic	\$0.66	https://www.digikey.com/product-detail/en/panasonic-electronic-components/ERA-8AEB1133V/P113KBCCT-ND/3069537			
18kOhm Resistor	1	ERA-8AEB183V	Panasonic	\$0.66	https://www.digikey.com/product-detail/en/panasonic-electronic-components/ERA-8AEB183V/P18KBCCT-ND/3069630			
0.1uF Cap (Css)	1	C1206C104J3RACTU	KEMET	\$0.60	https://www.digikey.com/product-detail/en/kemet/C1206C104J3RACTU/399-11180-1-ND/4357909			
27kOhm Resistor (Rcomp)	1	ERA-8AEB273V	Panasonic	\$0.66	https://www.digikey.com/product-detail/en/panasonic-electronic-components/ERA-8AEB273V/P27KBCCT-ND/3069706			
1600pF Cap (Ccomp)	1	C1206C162J5GAC7800	KEMET	\$0.66	https://www.digikey.com/product-detail/en/kemet/C1206C162J5GAC7800/399-17466-1-ND/8570433			
5V Boost Converter Components (800mA max)								
5V Boost Converter	1	LTC3426ES6#TRPBF	Linear Technology	\$4.52	https://www.digikey.com/product-detail/en/linear-technology-analog-devices/LTC3426ES6-TRPBF/LTC3426ES6-TRPBFCT-ND/8603417			
10uF Cap	1	JMF316AB7106KLHT	Taiyo Yuden	\$0.52	https://www.digikey.com/products/en/capacitors/ceramic-capacitors/607x-8&keyword=&sv=0&pv7=2&pv2049=y10%2C%2B%2F&pv14=34&sf=0&FV=ff=0003&q=quantity=8&ColumnSort=0&page=1&newproducts=1&pageSize=25			
22uF Cap	1	CM316X5R226K06AT	Kyocera	\$0.53	https://www.digikey.com/product-detail/en/kyocera-international-inc/electronic-components/CM316X5R226K06AT/1253-2084-1-ND/10197180			
2.2uH Inductor	1	DFE322520FD-2R2M=P2	Murata Electronics	\$0.91	https://www.digikey.com/product-detail/en/murata-electronics/DFE322520FD-2R2M=P2/490-18405-1-ND/10135416			
95.3kOhm Resistor	1	RC1206FR-0795K3L	Yageo	\$0.10	https://www.digikey.com/product-detail/en/yageo/RC1206FR-0795K3L/311-95.3KFRCT-ND/732124			
30.9K Resistor	1	RC1206FR-0730K9L	Yageo	\$0.10	https://www.digikey.com/product-detail/en/yageo/RC1206FR-0730K9L/311-30.9KFRCT-ND/731750			
Shotky Diode	1	MBRA210LT3G	ON Semiconductor	\$0.48	https://www.digikey.com/product-detail/en/on-semiconductor/MBRA210LT3G/MBRA210LT3GOSCT-ND/919794			
Power On LED								
Power On LED	1	COM-09592	Sparkfun	\$0.35	https://www.sparkfun.com/products/9592			
RGB Status LEDs	1	COM-00105	Sparkfun	\$2.05	https://www.sparkfun.com/products/105			