

# **The Bluetooth Controlled Relay Board & Speech Recognition Sets**

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**ENGINEERINGSHOCK ELECTRONICS**

## **Bluetooth Speech Module Features:**

- 1) 10x Controllable Outputs
- 2) LCD Display
- 3) Arduino Compatible
- 4) Momentary & Latching Modes Of Operation

## **Bluetooth Controlled Relay Board Features:**

- 1) 4x On-Board Relays
- 2) Momentary & Latching Modes Of Operation
- 3) Optional Solenoid Lock Operation

# The Bluetooth Controlled Project Boards

Thank you for purchasing the Speech recognition set, the relay board set, or both!. This manual will concentrate on the requirements, the accessories, and the schematic diagrams, while the video manuals will concentrate on operation. Thank you for your patronage! It is most sincerely appreciated!

## Table of Contents

REQUIREMENTS:.....	3
The Android Apps: .....	3
RoboRemo Installation & User Interface Instructions: .....	3
INCLUDED PARTS:.....	3
Speech Recognition Set: .....	3
Relay Board Set: .....	3
THE VIDEO MANUAL & OTHER RELATED VIDEOS .....	3
THE ACCESSORIES: .....	4
The Wire Connectors:.....	4
The 2-Pin Header Connectors: .....	4
The 9v 1000mA (120-240VAC to 9VDC) AC-DC Power Adapter: .....	4
The 120-240VAC IN (50-60Hz)// 12v 2A OUT AC-DC Wall Adapter:.....	5
The Optional Solenoid Lock: .....	5
The HC-06 Bluetooth Receiver Module:.....	5
THE BLUETOOTH SPEECH MODULE BLOCK DIAGRAM: .....	6
Hardware Blocks: .....	6
The 5mm Power Supply Jack: .....	6
The Output Rail: .....	7
The LCD Connector: .....	7
The Mode Selection header: .....	7
The Bluetooth Connector: .....	7
About This Unit: .....	7
THE BLUETOOTH RELAY BOARD MODULE BLOCK DIAGRAM:.....	8
The 5mm Power Supply Jack: .....	8
The Relay Output Terminal Blocks:.....	8
The Bluetooth Connector: .....	9
The Mode Selection header: .....	9
The Solenoid Connector: .....	9
About This Unit: .....	9
SCHEMATIC DIAGRAMS: .....	9
The Bluetooth Controlled Speech Recognition Module Schematic:.....	10

The Bluetooth Controlled Relay Board Module Schematic:.....	11
IMPORTANT NOTES & DISCLAIMERS: .....	11
MANY THANKS!.....	12

## **Requirements:**

### ***The Android Apps:***

In order to use the speech recognition set, you will need to be able to operate Android based applications on your smart phone. The AMR\_Voice application is a free app that translates speech and send that data via Bluetooth to your receiver. It is easy to use, and free to download from the app store. The Bluetooth relay board requires an application called “RoboRemo”. This app is also free to download, but you can also purchase the full app for only a few dollars. It is a wonderful app, and you can do so much with it. There is a section below that was offered by the creators of RoboRemo that will allow for you to play around with your HC-06 Bluetooth receiver using an Arduino Uno. RoboRemo has also offer some code samples, which are provided below. The RoboRemo interface that we designed can be found below with installation instructions.

### ***RoboRemo Installation & User Interface Instructions:***

See Here: <http://www.engineeringshock.com/bt-relay-page.html>

## **Included Parts:**

### ***Speech Recognition Set:***

1x Fully Tested & Assembled Bluetooth Controlled Speech Module  
10x Female-Female Wire Connectors  
1x 9v 1A AC-DC Wall Adapter

### ***Relay Board Set:***

1x Fully Assemble & Tested Bluetooth Controlled Relay Board Module  
1x Solenoid Lock Module (Only included if the listing specifies as such)  
1x 9v 1A AC-DC Wall Adapter OR 1x 12v 2A AC-DC Wall Adapter (Depending On Purchase)

## **The Video Manual & Other Related Videos**

The video manual is your main guide to using both of these boards. The video manual covers connecting your HC-06 receiver to your smart phone, and how to use each of the boards. It is imperative that you watch this video. There is also a video that shows you how to connect AC devices to the relays on the relay board module.

**Video Manual:**

How To Use The Relays On The Relay Board: <https://www.youtube.com/watch?v=kiXAylsvCAo>  
Original Speech Module Manual Video: <https://www.youtube.com/watch?v=czUE7-tRA4>  
Original Bluetooth Relay Board Manual Video: <https://www.youtube.com/watch?v=8tl-Fg55Ubc>

## The Accessories:

### *The Wire Connectors:*

These wire connectors allow for you to make connections between the speech recognition board and external circuitry, such as an Arduino board. Below is a picture of female-female connectors.



### *The 2-Pin Header Connectors:*

Both boards require 2-pin jumpers to select between momentary and latching modes of operation. In the case of the relay board, you need to use one of these jumpers to enable the optional solenoid lock.



### *The 9v 1000mA (120-240VAC to 9VDC) AC-DC Power Adapter:*

These power supplies are compatible with any input voltage between 120VAC and 240VAC (For those of you find people overseas). All you need to do is plug the AC adapter into the board. There is a 5mm power jack on the board, and the adapter plugs into the processor board directly.



### ***The 120-240VAC IN (50-60Hz)// 12v 2A OUT AC-DC Wall Adapter:***

This AC-DC adapter is American and European wall outlet power supply friendly. However, if you are in Europe, you'll need an adapter to plug this into your wall. This adapter can be used to power either of the modules, but is meant for the Bluetooth relay module when you have the optional solenoid lock connected. If you are not using the solenoid lock, then the 9v adapter is better suited.



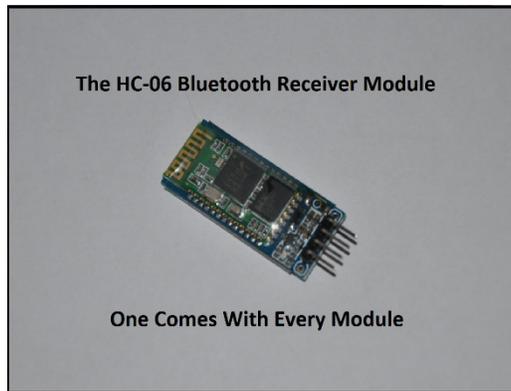
### ***The Optional Solenoid Lock:***

This little guy is a ton of fun. I wanted to make this project just a little more special, so I included a diode protected driver circuit on the Bluetooth relay board set. You can use this lock if you'd like. It does not include mounting hardware, but household screws should do it.

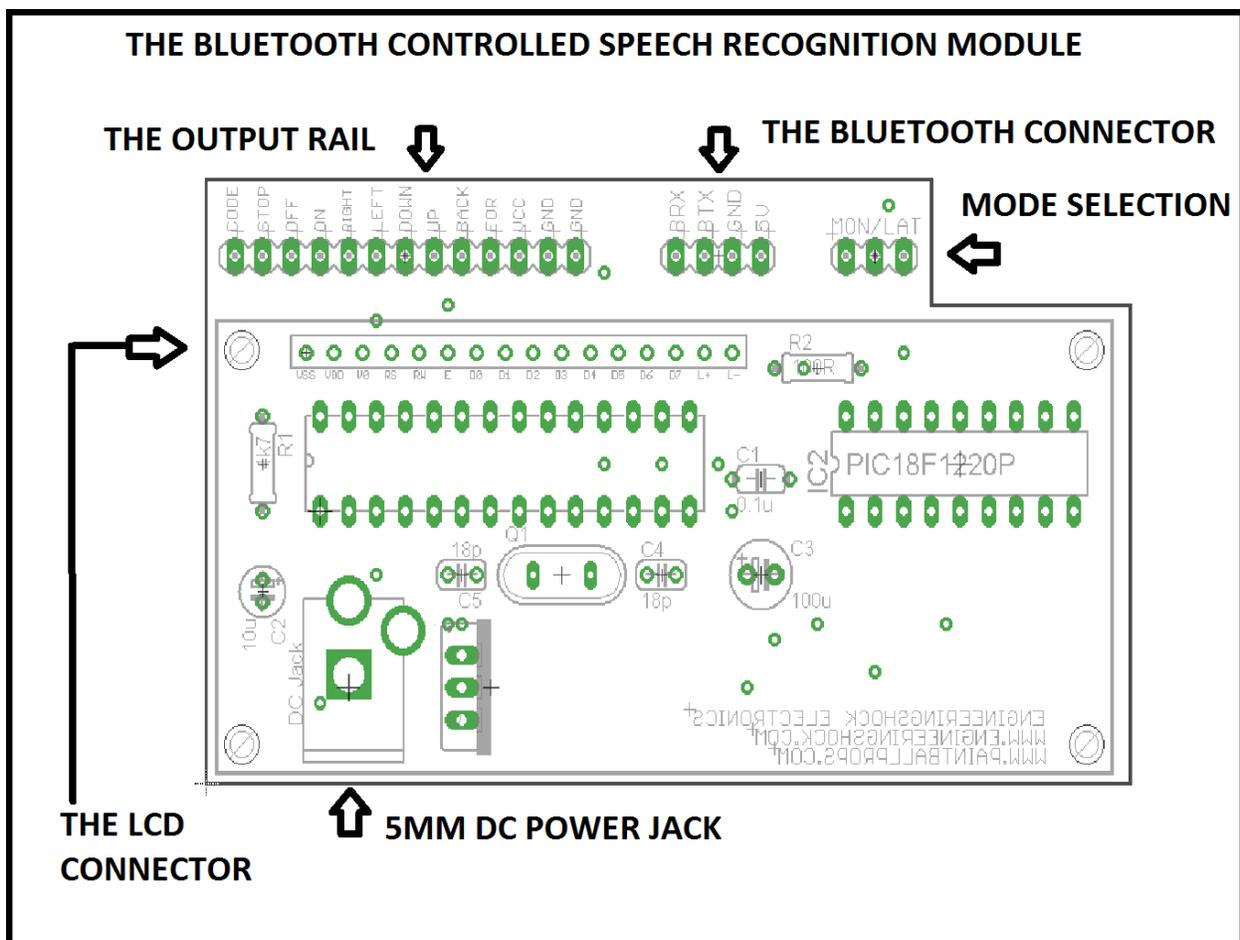


### ***The HC-06 Bluetooth Receiver Module:***

One of these Bluetooth receivers comes with every set. It can be connected/disconnected with easy by simply placing them into the female headers on the board. This will be talked about in the manuals, but make sure that when you make your connections that you watch orientation. Placing them in backwards will fry them! When you sync your phone to these little guys, the password will be "1234". Once synced, you are off to the races!



## The Bluetooth Speech Module Block Diagram:



### Hardware Blocks:

#### The 5mm Power Supply Jack:

The Bluetooth speech recognition board requires 8-10VDC @ 100mA or more. The 9v 1A AC-DC adapter that comes with most reward tiers plugs directly into the DC power jack. If you wish to use your own

power supply, then you can use your own AC-DC wall adapter as long as it offers a clean 8-10VDC supply capable of sourcing more than 100mA.

### ***The Output Rail:***

The output rail consists of 13x pins. Ten of these pins are speech recognition pins that operate based on the following words: "Forward", "Backward", "Up", "Down", "Left", "Right", "On", "Off", "Stop", & "4444". The "Forward" pin is labeled "FOR", and the "Backward" pins is labelled "BACK". Operation is chosen using the "MODE SELECTION" 3-pin header.

### ***The LCD Connector:***

While you cannot see the LCD in the block diagram, the LCD is connected to the main board using this connector. You do not need to worry about this, as this unit comes fully assembled and tested.

### ***The Mode Selection header:***

The Mode selection header allows for you to choose between momentary and latching modes of operation. This cannot be switched on the fly. You must choose which mode you want to operate in on power up.

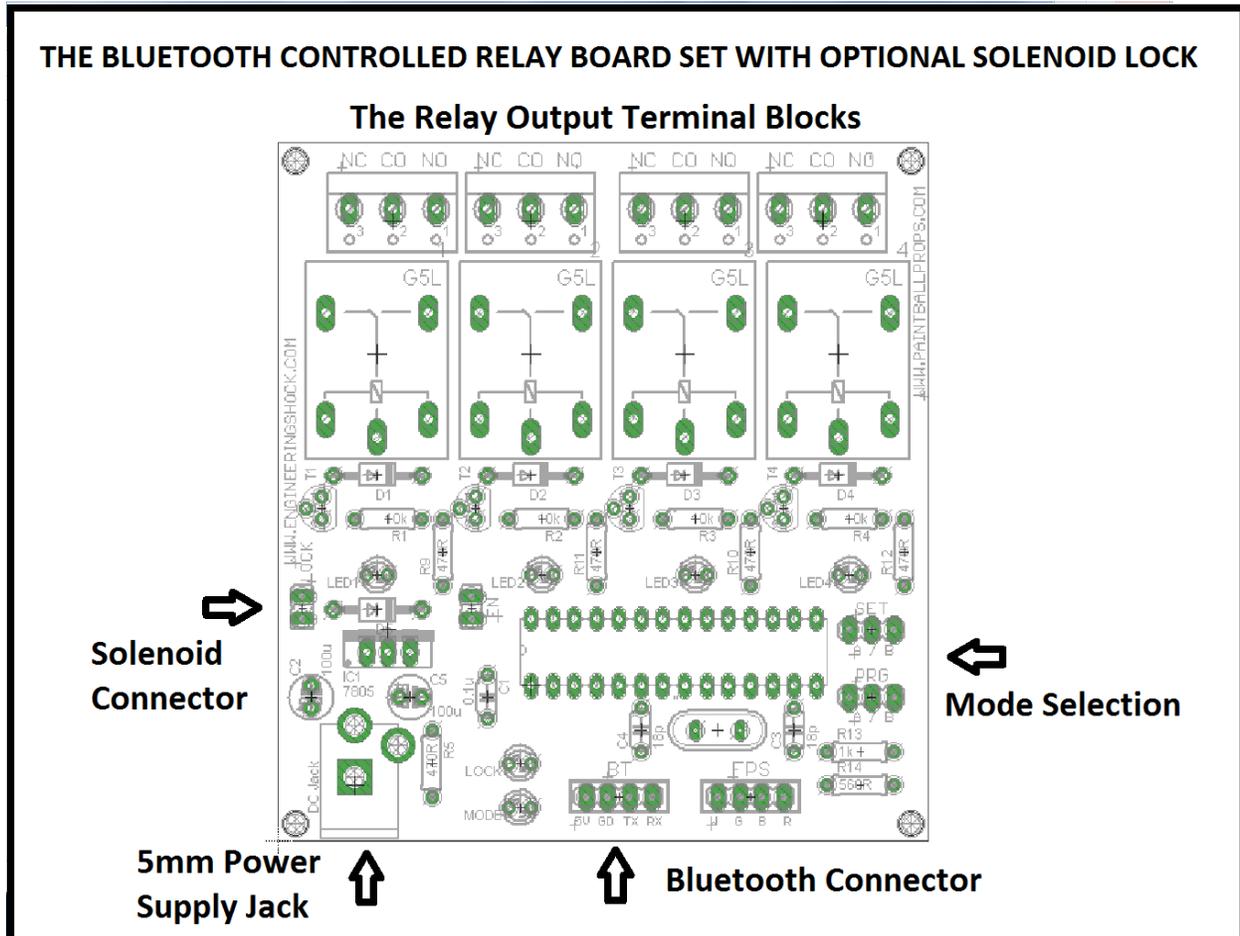
### ***The Bluetooth Connector:***

This female 4-pin header is where you connect your HC-06 receiver module. Make sure that when you connect your HC-06 that you don't have it placed in reverse. This is covered in the video manual.

### ***About This Unit:***

This bad boy is simple, and easy to use. With the help of the free AMR\_Voice App, you can control 10x Arduino compatible outputs. The LCD will display the text of what you've said into your phone. If you've said any of the following words, then that relative output will be activated: "Forward", "Backward", "Up", "Down", "Left", "Right", "On", "Off", "Stop", & "4444". You have the option of selecting between latching and momentary modes of operation. The final output is labelled "Code", and this corresponds to "4444". When say the word "Four" 4x times one after another, then this output will be activated. Alternately, you can use this module to communicate between rooms within the house! The HC-06 Bluetooth receiver module can be synced with and communicated with at up to 10 meters. I've personally tested from one end of my house to the other, and have no problems with connectivity!

## The Bluetooth Relay Board Module Block Diagram:



### *The 5mm Power Supply Jack:*

The Bluetooth Relay board requires 7.5-10VDC @ 400mA or more. The 9v 1A AC-DC adapter that comes with most reward tiers plugs directly into the DC power jack. If you wish to use your own power supply, then you can use your own AC-DC wall adapter as long as it offers a clean 7.5-10VDC supply capable of sourcing more than 400mA. **HOWEVER...** If you are using the optional solenoid lock module, you should use a 12v 1A AC-DC adapter. **No more than 12v should be used**, and your power supply should be able to source at least 1A or more.

### *The Relay Output Terminal Blocks:*

This terminal blocks are where you'd be connecting your high power switching. Or low power switching for that matter. There are four relays on board. Relay#1 can be used to drive the solenoid. When any given relay is off, the CO (Common) pin is connected internally to the NC (Normally Closed) pin. When the relay is turned on, then the CO pin disconnects from the NC pin, and connects internally to the NO pin (Normally Open). Think of this as an on-off switch that is isolated from the rest of the circuitry.

### ***The Bluetooth Connector:***

This female 4-pin header is where you connect your HC-06 receiver module. Make sure that when you connect your HC-06 that you don't have it placed in reverse. This is covered in the video manual.

### ***The Mode Selection header:***

The Mode selection header allows for you to choose between momentary and latching modes of operation. This cannot be switched on the fly. You must choose which mode you want to operate in on power up. There are two 3-pin headers here. We do not use the PRG header for anything. We only want to concern ourselves with the "SET" Header. Using a 2-pin jumper you can select mode "A" or mode "B". Setting the "SET" header to mode "A" will place you into Momentary mode, while selecting "B" will place you into latching mode. You can change this on the fly.

### ***The Solenoid Connector:***

You may or may not choose to use the optional solenoid lock module. If you are to use this module, simply connect the ribbon connector on the solenoid lock to the solenoid connector. There is no polarity, so place it on either way. HOWEVER... If you are to use the solenoid, you NEED to use a 2-pin jumper to short the "EN" 2-pin header together, otherwise the solenoid will not work. Relay#1 controls the optional solenoid module, and it cannot be used for anything else when controlling the solenoid. **It is very important that if you ARE NOT using the solenoid, that it is not connected to the board. Just as importantly, you need to ensure that you remove the "EN" jumper when you are not using the solenoid on relay#1. If you do not, you WILL fry your board. If you have any questions, please send us an email, and we will respond ASAP.**

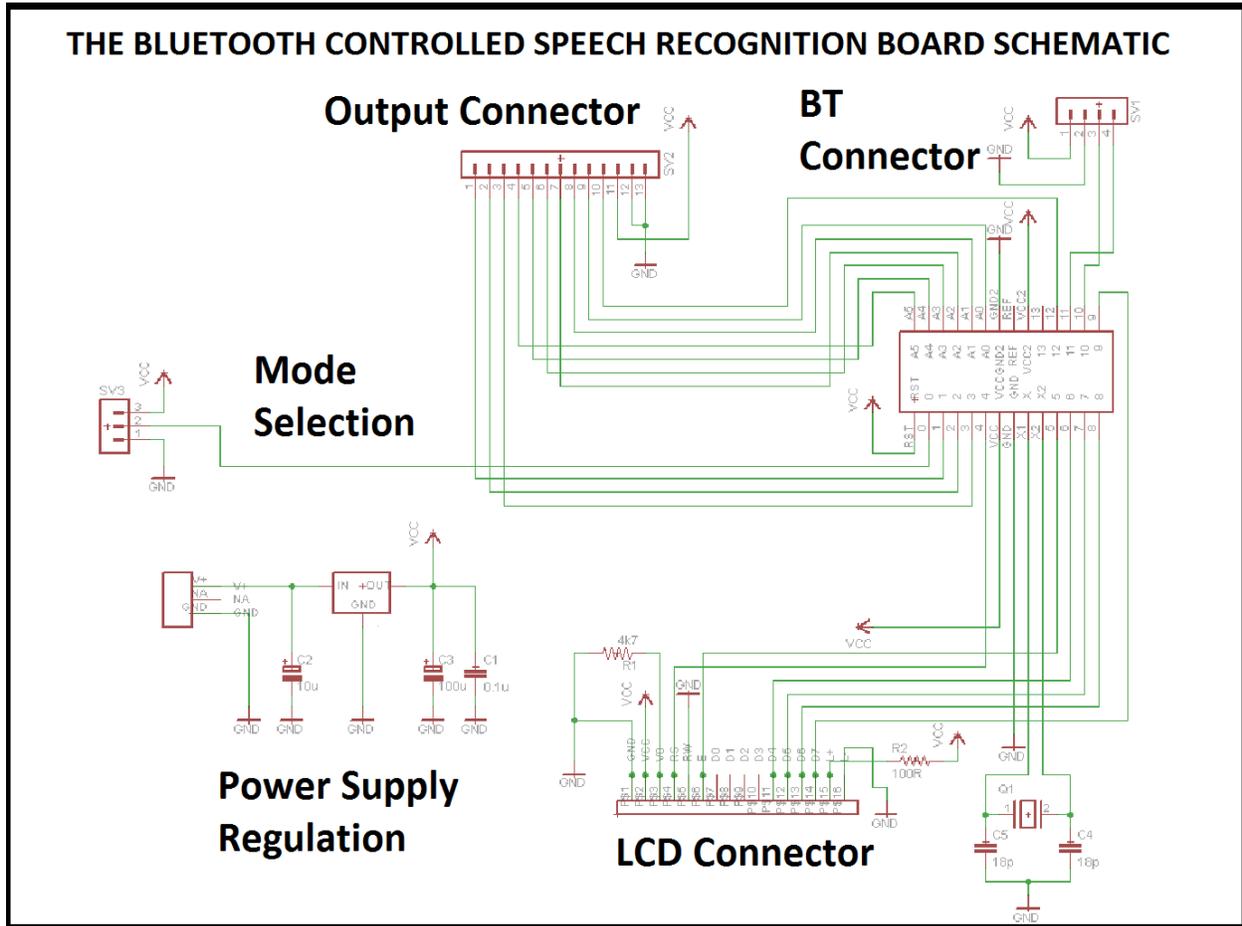
### ***About This Unit:***

There are quite a few apps out there that can send data from a smart phone via Bluetooth to control your circuit. I personally use RoboRemo, as it fun and easy to use. There is a free version, but you can upgrade for a very fair price. Using this free Android app, I'm able to wirelessly control the four high power relays on this module. There is also an optional solenoid lock (Available in certain reward tiers) that will allow for you to create a Bluetooth lock with ease! It is extremely easy to use, and I will be creating a video showing you how to use RoboRemo. You do not need to use this App specifically, but I find it to be very efficient! Simply sync your device to this relay board, and use the app to control the relays! There are momentary and latching options which can be changed on the fly!

### **Schematic Diagrams:**

Please note that the schematic diagrams below might be difficult to read, so there is an external file for you to download for each of the diagrams. If you cannot open the enclosed schematics, and this is problematic for you, please feel free to contact us, and will set you up ASAP!

# The Bluetooth Controlled Speech Recognition Module Schematic:

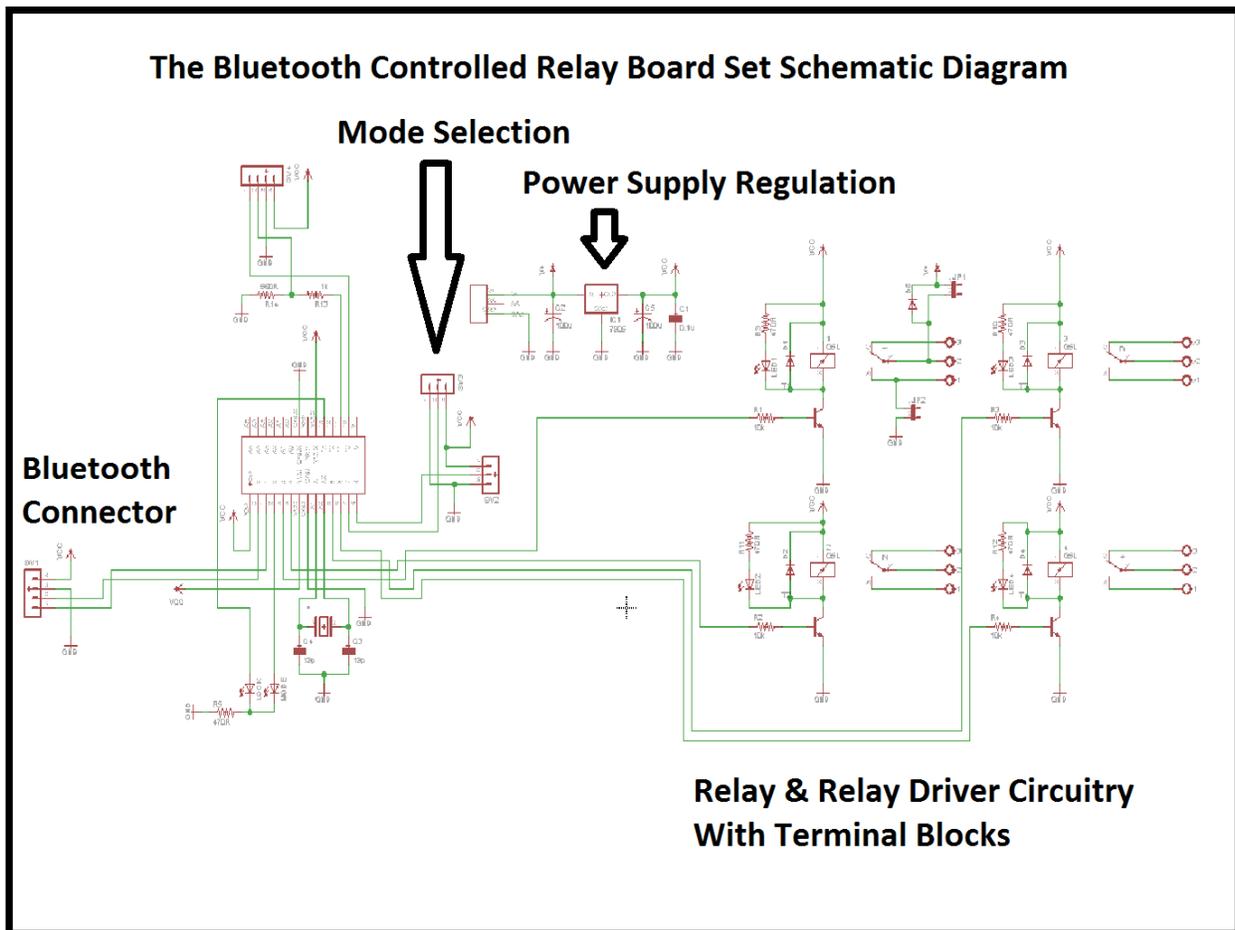


PDF Copy:



BT Speech Schematic.pdf

## The Bluetooth Controlled Relay Board Module Schematic:



PDF Copy:



BT Relay  
Schematic.pdf

## Important Notes & Disclaimers:

- 1) In the case of the Bluetooth Relay board, the 5v regulator (7805) can get hot when several relays are on for long periods of time. The reason for this is because the relays take quite a bit of power to drive, and a solid regulated 5v is required. Due to the fact that there is a 4v differential between the 9v input, and the 5v output, when more than one relay is one for a long duration, the regulator will warm up. These units have been tested for hours, and I've found no failures with the regulator. However, if this is a concern to you, you can heat sink it. If you have any questions, please feel free to ask. If you are using the relay board for switching purposes, it is imperative that you use the 9v 1A wall adapter. Only use a 12v wall adapter if you are driving the optional solenoid peripheral.

- 2) The relay board was not designed to take over as a security system with the solenoid lock. The circuitry is relatively simple, and can be hacked. Please make sure that you don't use these boards to protect property or people. They were not designed for that purpose. They were designed as fun project boards. I will not be held accountable if these boards are misused.
- 3) If you are mounting your boards, please ensure that they are mounted safely into industrial grade enclosures. Make sure that there is no shorting when mounting these boards. If you are mounting into a metallic case, ensure that the bottom of each board is at least 1cm off of the surface to diminish the possibility of shorting.
- 4) These boards are safe to use, but as soon as you put high power on the relays, then you have to consider your safety. If you have never worked with high voltage AC before, then please have someone with you when working with it. If you are not careful, the result can be disastrous. You could be seriously shocked, or even killed with high power AC mains. I will not be held accountable if you hurt or kill yourself. Please be very thoughtful and careful when working with high power AC and have someone with you who knows what they are doing. Watch all of the videos, and educate yourself on AC voltage before attempting to connect AC mains to the Bluetooth controlled relay module.

## **Many Thanks!**

Many thanks for pledging to this kickstarter campaign/purchasing these sets from my websites. I do appreciate your patronage! I hope that you enjoy working with this set, and that you're able to implement it into your projects. Take care, and thanks again for taking the time to read through this document.