

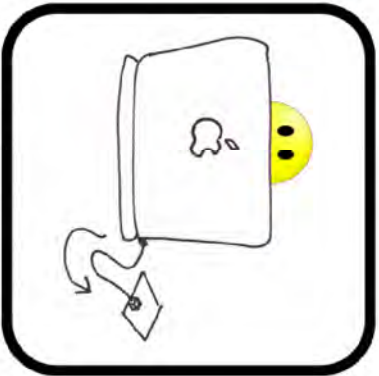
Make your own... Thereminuo

by Mike Blow

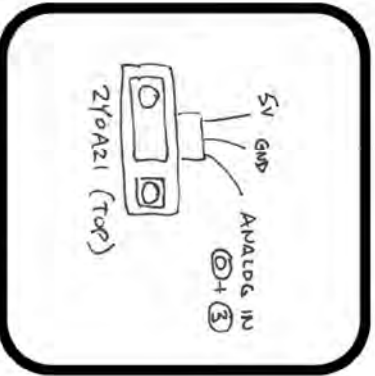


What you'll need

- 1 x Arduino Duemilanove
- 1 x Wooden or aluminium box
- 1 x Sharp 2y0a21 IR range finder
- 1 x Arcade button (momentary push-to-make)
- 1 x On/off toggle switch
- 4 x 10k lin pots
- 1 x 5.1k resistor
- 1 x 5v LED
- 1 x 1/4" Mono jack socket
- 2 x 2.1mm power connectors (one plug, one socket)
- Mounting hardware (screws, PCB spacers)
- PCB header pins
- Hook-up wire
- Screened audio cable
- Laptop and USB cable
- Tools
- 12v power supply
- The Internet

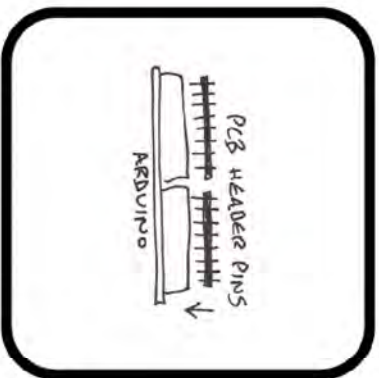


1. Download the Thereminuo code and circuit diagram from <http://www.evolutionaryart.co.uk/thereminuo.php> and upload the code to your arduino.

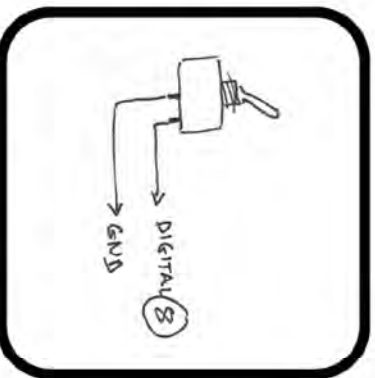


4. Connect the infrared sensor to +5v and GND. Connect the output to Arduino analog in pins 0 and 3.

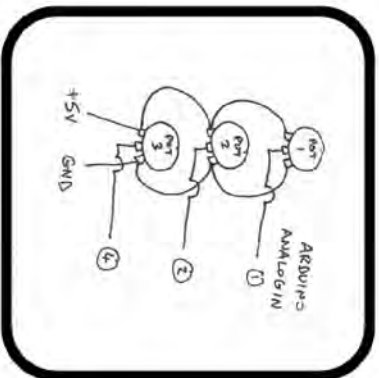
Everyone knows Thereminuos are fun but most people think they are hard to build. Not so! Armed with only a laptop, soldering iron and a few components you too can become a Thereminuo master. Here's how!



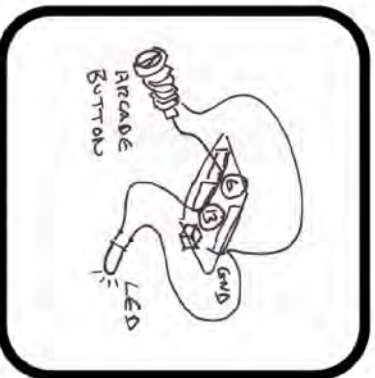
2. Break off the right length strips of the PCB header pins to fit into the arduino connectors. You can solder to these and glue them to the arduino so they won't shake loose. Its better than just poking the wires in the holes.



5. Connect the toggle switch, which selects the ruder/poole modes. One side goes to Arduino digital pin 8, the other to GND.



3. Next wire the pots which control the grain speeds and decay rates. Each needs +5v and GND from the arduino (5v on the right lug and GND on the left, looking at the bottom of the pot with the lugs pointing down). Connect the center lugs to Arduino analog in pins 1, 2 and 4.



6. Connect the speed LED. One side goes to Arduino digital pin 13, the other to GND. Then connect the LED in the arcade button. One side goes to Arduino digital pin 6, the other to GND.

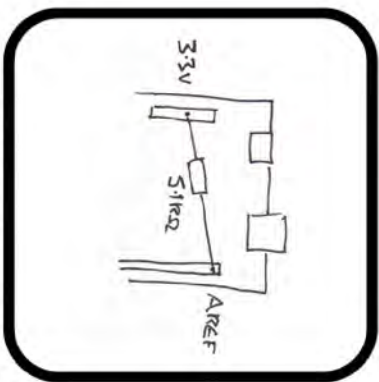


Make your own... Thereminuino

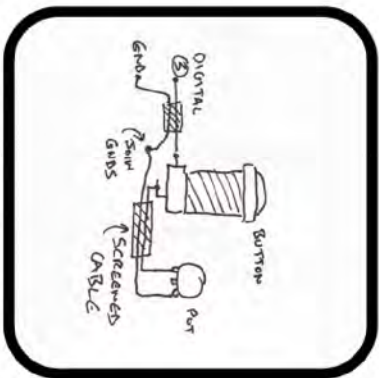
Part II

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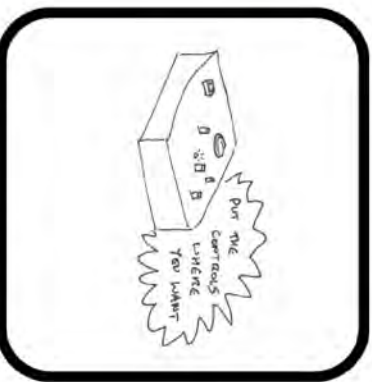
Where it all began ... the Arduino
The Thereminuino is a hacked version of the open source Arduino grain synth programmed by Peter Knight. Find out more at <http://code.google.com/p/linkerit/wiki/Arduino>



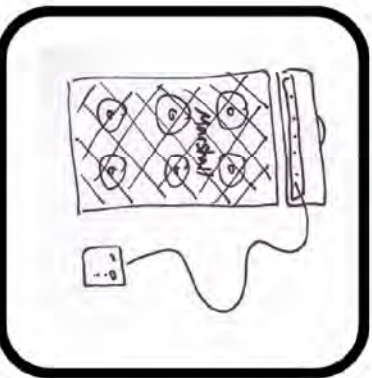
7. Connect the 5.1k resistor between the Arduino's 3.3V and AREF pins.



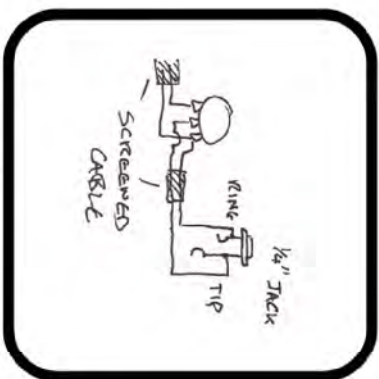
8. The audio output is next. Connect Arduino digital pin 3 to one side of the arcade button using the screened cable. Connect the other side to the LH lug of the remaining pot, and connect the screen to the RH lug. You could also use a log pot here but it works OK.



11. Mount the components in your box. I used a particularly delightful guitar effects pedal box, but any box will do. You can use blobs of glue on the speed LED and between the PCB header pins and the arduino connectors so they won't shake loose.



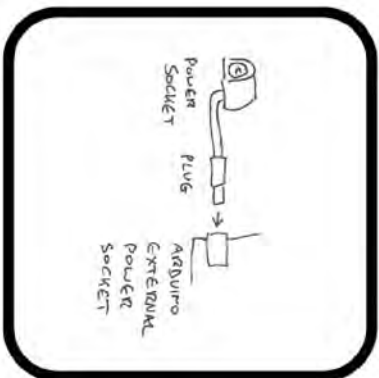
12. Time to play! First "IMPORTANT" make sure the power supply to the arduino is 12v center positive. If it is, plug it into the arduino. Power up and plug the audio output into a guitar amp. The Thereminuino is quite loud, so turn the volume pot down first.



9. Again using shielded cable, connect the center lug of the pot to the 1/4" guitar jack tip connection and connect the cable shield to the RH lug and the jack socket ring connection.



13. To play the Thereminuino, press the arcade button down while moving your hand up and down above the IR sensor. Experiment with the controls. In police mode only the speed control works. If rude mode the speed and the two grain delay controls operate.



10. Wire up the power connectors, the plug fits in the arduino and the socket will be mounted on the box. Don't plug the power into the arduino yet.



14. Hack the code, add different components, make your own version of the Thereminuino, and share it online. Then submit it to the next 'Make it Yourself' exhibition.

