M.A.D. Dog Controls, Indicators, and Interconnects

1. **Speaker**
   Connect a speaker here.
   - Pin 1 - Speaker
   - Pin 2 - Ground

2. **Sonar**
   Connect a sonar rangefinder here.
   - Pin 1 - Ground
   - Pin 2 - A
   - Pin 3 - B
   - Pin 4 - 5V

3. **IR Ranger #1**
   Connect a distance measuring IR ranger here.
   - Pin 1 - Ground
- Pin 2 - Vir
- Pin 3 - Analog 5V

4. **Motor Encoder #1**
   Connect a motor encoder here.
   - Pin 1 - A
   - Pin 2 - B
   - Pin 3 - Ground
   - Pin 4 - 5V

5. **Motor Controller**
   Connect a motor controller here. (Enable1, L1, L2, Enable2, L3, L4)
   - Pin 1 - Enable L
   - Pin 2 - L1
   - Pin 3 - L2
   - Pin 4 - Enable R
   - Pin 5 - L3
   - Pin 6 - L4

6. **PIR #1**
   Connect a PIR Sensor here.
   - Pin 1 - Ground
   - Pin 2 - 3.3V
   - Pin 3 - Signal 1
   - Pin 4 - Signal 2
   - Pin 5 - Signal 3
   - Pin 6 - Signal 4 (3.3V)
   - Pin 7 - Signal 5
   - Pin 8 - Ground
   - Pin 9 - 3.3V
   - Pin 10 - Test Header

7. **Motor Encoder #2**
   Connect a motor encoder here.
   - Pin 1 - A
   - Pin 2 - B
   - Pin 3 - Ground
8. **Power**
   Connect a power source here.
   - Pin 1 - Ground
   - Pin 2 - Input Power

9. **IR Ranger #2**
   Connect a distance measuring IR ranger here.
   - Pin 1 - Ground
   - Pin 2 - Vir
   - Pin 3 - a5V

10. **GPIO Test Pins**
    These (10) pins can be used to observe test signals on the processor.

11. **Compass**
    Connect a compass here.
    - Pin 1 - NC
    - Pin 2 - NC
    - Pin 3 - Signal 1
    - Pin 4 - Signal 2
    - Pin 5 - Signal 3
    - Pin 6 - Signal 4
    - Pin 7 - Signal 5
    - Pin 8 - Ground
    - Pin 9 - NC
    - Pin 10 - 5V

12. **PIR #2**
    Connect a PIR Sensor here.
    - Pin 1 - Ground
    - Pin 2 - 3.3V
    - Pin 3 - Signal 1
    - Pin 4 - Signal 2
    - Pin 5 - Signal 3
    - Pin 6 - Signal 4 (3.3V)
13. GPIO Test Pins
These (10) pins can be used to observe test signals on the processor.

14. SDRAM Test Pins
These (10) pins are used to observe test signals from the SDRAM.
- Pin 1 - 3.3V
- Pin 2 - Ground
- Pin 3 - Signal 1
- Pin 4 - Signal 2
- Pin 5 - Signal 3
- Pin 6 - Signal 4
- Pin 7 - Signal 5
- Pin 8 - Signal 6
- Pin 9 - Signal 7
- Pin 10 - Signal 8

15. Reset LED
This LED, when lit, confirms that the processor is reset. This LED should light when the reset button (23) is pressed, setting the reset signal low.

16. GPIO Test LEDs
These (8) LEDs are used to visually observe test output from the processor.

17. GPIO Test Pins
These (20) pins can be used to observe test signals on the processor.

18. Wifi
Connect a WiFi module here.
- Pin 1 - 3.3V
- Pin 2 - UART TX
- Pin 3 - UART RX
- Pin 4 - GPIO8
● Pin 5 - RESET
● Pin 6 - GPIO5
● Pin 7 - GPIO7
● Pin 8 - GPIO9
● Pin 9 - GPIO1
● Pin 10 - Ground
● Pin 11 - GPIO14
● Pin 12 - NC
● Pin 13 - NC
● Pin 14 - NC
● Pin 15 - 3.3V
● Pin 16 - NC
● Pin 17 - NC
● Pin 18 - NC
● Pin 19 - NC
● Pin 20 - NC

19. GPIO Test Pins
   These (20) pins can be used to observe test signals on the processor.

20. GPIO Test Pins
   These (10) pins can be used to observe test signals on the processor.

21. GPIO Test Pins
   These (10) pins can be used to observe test signals on the processor.

22. Bootloader Button (right)
   This button, when held during reset process, the processor will enter bootloader mode. Additionally it can be used as a GPIO pin (pin 110).

23. Reset Button (left)
   This button, when pressed, resets the processor.

24. Bootloader/PIR UART Switch
   *Switch has been replaced by header pins*
   This switch can be placed in two configurations.
<table>
<thead>
<tr>
<th>Wire A</th>
<th>Wire B</th>
<th>Wire C</th>
<th>UART0 Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connected</td>
<td>Connected</td>
<td>Disconnected</td>
<td>PIR</td>
</tr>
<tr>
<td>Disconnected</td>
<td>Disconnected</td>
<td>Connected</td>
<td>RS232</td>
</tr>
</tbody>
</table>

**25. RS232**

An RS232 cable is used to connect a computer to the board here for programming and debugging purposes.

- Pin 1 - NC
- Pin 2 - RX
- Pin 3 - TX
- Pin 4 - NC
- Pin 5 - Ground
- Pin 6 - NC
- Pin 7 - NC
- Pin 8 - NC
- Pin 9 - NC

**26. PIR #3**

Connect a PIR Sensor here.

- Pin 1 - Ground
- Pin 2 - 3.3V
- Pin 3 - Signal 1
- Pin 4 - Signal 2
- Pin 5 - Signal 3
- Pin 6 - Signal 4 (3.3V)
- Pin 7 - Signal 5
- Pin 8 - Ground
- Pin 9 - 3.3V
- Pin 10 - Test Header

**27. GPIO Test Pins**

These (10) pins can be used to observe test signals on the processor.