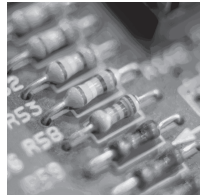


# Digital Multimeter

## OBJECTIVES

1. Measure resistance on a speaker.
2. Measure voltage from a power supply.



Hardware

## RESOURCES

1. Marcraft 8000 Trainer
2. Digital multimeter with leads
3. A good fuse
4. A bad fuse

## DISCUSSION

This lab will help you to measure various electrical quantities on a computer. The multimeter can be used to measure resistance, current, and potential across a circuit.

## PROCEDURE

### 1. Resistance on speaker

- \_\_\_ a. Remove the side panel off the computer.
- \_\_\_ b. Rotate the multimeter dial to 200 ohms.
- \_\_\_ c. Hold the red lead on the exposed end of the red wire that connects the system speaker.
- \_\_\_ d. Hold the black lead on the exposed end of the black wire that connects the system speaker.
- \_\_\_ e. Record the reading of the meter in Table 5-1.

### 2. Voltages

- \_\_\_ a. Turn on the power to the computer.
- \_\_\_ b. Look for the 20-pin ATX power connector that is plugged into the board. It should look similar to location 1 in Figure 5-1.

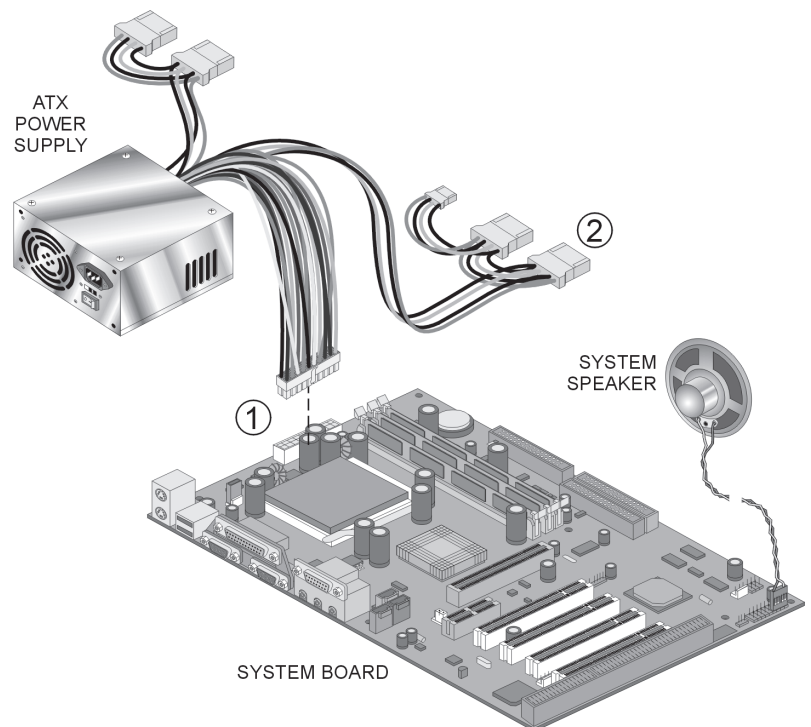


Figure 5-1: Power Supply Connector

PROCEDURE - 5

- \_\_\_ c. Rotate the multimeter dial to 20 Vdc.
- \_\_\_ d. Firmly secure the black connector of the multimeter into a black connector of one of the 4-pin internal drive power connectors (location 2).
- \_\_\_ e. Insert the red multimeter connector into each pin on the ATX connector and record their respective voltages in Table 5-2.

NOTE: The pin number is small and may be labeled on the back wire side of the connector. The yellow wire should be pin one.

- \_\_\_ f. Check the voltage at each pin of the 4-pin internal drive power connector and record the values in Table 5-3.
- \_\_\_ g. Turn the computer off.
- \_\_\_ h. Replace the side panel.

3. Fuses

- \_\_\_ a. Obtain the two fuses, one good and one bad, from your instructor.
- \_\_\_ b. Rotate the multimeter dial to 200 ohms.
- \_\_\_ c. Touch the two leads together and record the multimeter reading in Table 5-4. You are now establishing a datum or zero point of no resistance.
- \_\_\_ d. Without touching the leads together record the multimeter reading in Table 5-5.
- \_\_\_ e. Place one lead on one end of the good fuse.
- \_\_\_ f. Place the other lead on the other end of the good fuse. Be sure that your fingers or the leads are not touching each other.

NOTE: The only path for electricity to flow is through the fuse.

- \_\_\_ g. Record the multimeter reading in Table 5-6.
- \_\_\_ h. Place one lead on one end of the bad fuse.
- \_\_\_ i. Place the other lead on the other end of the bad fuse. Be sure that your fingers or the leads are not touching each other.

NOTE: The only path for electricity to flow is through the fuse.

- \_\_\_ j. Record the multimeter reading in Table 5-7.
- \_\_\_ k. Return all your equipment to your instructor.

TABLES

Table 5-1

|                     |  |
|---------------------|--|
| Speaker Resistance: |  |
|---------------------|--|

Table 5-2

| ATX Voltages |         |         |         |
|--------------|---------|---------|---------|
| Pin No.      | Voltage | Pin No. | Voltage |
| 1            |         | 11      |         |
| 2            |         | 12      |         |
| 3            |         | 13      |         |
| 4            |         | 14      |         |
| 5            |         | 15      |         |
| 6            |         | 16      |         |
| 7            |         | 17      |         |
| 8            |         | 18      |         |
| 9            |         | 19      |         |
| 10           |         | 20      |         |

Table 5-3

| 4-Pin Internal Drive Power Connector Voltages |         |         |         |
|---|---------|---------|---------|
| Pin No.                                       | Voltage | Pin No. | Voltage |
| 1   |         | 3       |         |
| 2   |         | 4       |         |

Table 5-4

|                  |  |
|------------------|--|
| Zero Resistance: |  |
|------------------|--|

**PROCEDURE - 5**

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**Table 5-5**

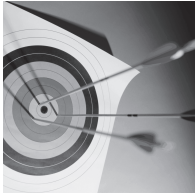
|                            |  |
|----------------------------|--|
| <b>Maximum Resistance:</b> |  |
|                            |  |

**Table 5-6**

|                              |  |
|------------------------------|--|
| <b>Good Fuse Resistance:</b> |  |
|                              |  |

**Table 5-7**

|                             |  |
|-----------------------------|--|
| <b>Bad Fuse Resistance:</b> |  |
|                             |  |



**Feedback**



**LAB QUESTIONS**

1. How many pins does an ATX power connector have?
2. The multimeter can be used to measure what?
3. What is the total range of voltages across the power supply?
4. What options does your multimeter support for DC voltage?
5. What should be the resistance of a good fuse?