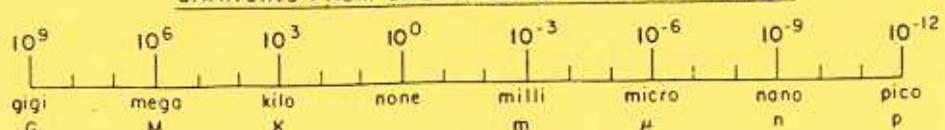


**ELECTRICAL TERMS, SYMBOLS, & NUMBERS**  
USAOMMCS X-17866      REVISED JAN 2002

This number scale gives a simple way for determining direction of movement of decimal, when changing from one power of ten to another. If your eye moves right on the scale when moving from the given power of ten to desired power of ten, then the decimal is moved right. If your eye moves left, then the decimal is moved left.

The number of places to move the decimal is the same as the difference in powers.

**CHANGING FROM ONE POWER OF TEN TO ANOTHER**



NAME	SYMBOL	DEFINITION	UNIT OF MEASURE		MEASURED WITH	OHMS LAW FORMULA
			NAME	SYMBOL		
Electromotive Force (EMF)	E	Electrical Force	Volt	V	Voltmeter	$E = IR$
Potential Difference						
Voltage						
Current	I	Electron Flow	Ampere	A, a	Ammeter	$I = E/R$
Resistance	R	Opposition to Current	Ohm	Ω	Ohmmeter	$R = E/I$
Power	P	Work	Watt	W, w	Wattmeter	$P = EI$ , $= I^2R$ , $= E^2/R$

Voltage in a Series Circuit

$$E_{\text{Applied}} = E_1 + E_{\text{total}} = E_T$$

Voltage in a Parallel Circuit

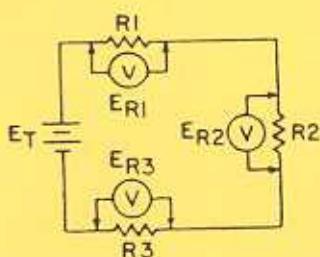
$$E_{R2} = \text{Voltage drop across } R_2$$

$$I_{R2} = \text{Current thru } R_2$$

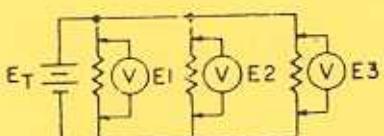
Ground: Connected to earth or "0" Potential Reference

Short: "0" Ohms

Open: Not connected, infinite resistance



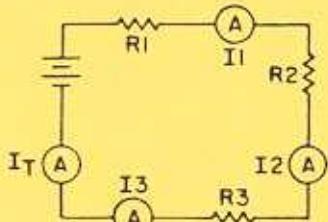
$$E_T = E_{R1} + E_{R2} + E_{R3}$$



$$E_T = EI = E2 = E3$$

### Current in a Series Circuit

$$I_T = I_1 = I_2 = I_3$$



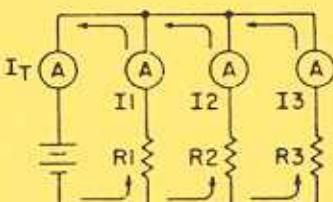
**Switch:** A device used to close or open (make or break) or (connect or disconnect) an electrical circuit.

**Positive Polarity:** Positive charge of electricity.

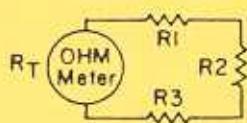
**Negative Polarity:** Negative charge of electricity.

### Current in a Parallel Circuit

$$I_T = I_1 + I_2 + I_3$$

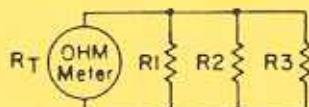


### Resistors in Series



$$R_T = R_1 + R_2 + R_3$$

### Resistors in Parallel



Three or more resistors (Different Values)

$$R_T = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$

### Equal Value Resistors

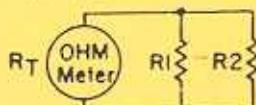
$$R_T = \frac{R_1}{N}$$

$R_1$  = Value of one Resistor

$N$  = Number of Resistors

### Two Resistors (Different Values)

$$R_T = \frac{R_1 \times R_2}{R_1 + R_2}$$



### CALCULATION OF SERIES CIRCUIT VOLTAGES

#### OHM'S LAW METHOD

##### TO FIND $E_{R1}$

$$1. R_T + R_1 + R_2 + 20 + 80 = 100\Omega$$

$$2. I_T \times E_A / R_T = 160 / 100 = 1.6A$$

$$3. E_{R1} = I_T \times R_1 = 1.6 \times 20 = 32V$$

##### TO FIND $E_{R2}$

$$1. R_T + R_1 + R_2 + 20 + 80 = 100\Omega$$

$$2. I_T \times E_A / R_T = 160 / 100 = 1.6A$$

$$3. E_{R2} = I_T \times R_2 = 1.6 \times 80 = 128V$$

#### RATIO METHOD

##### TO FIND $E_{R1}$

$$1. R_T + R_1 + R_2 + 20 + 80 = 100\Omega$$

$$2. E_{R1} = \frac{R_1}{R_T} \times E_A = \frac{20}{100} \times 160 = 32V$$

##### TO FIND $E_{R2}$

$$1. R_T + R_1 + R_2 + 20 + 80 = 100\Omega$$

$$2. E_{R2} = \frac{R_2}{R_T} \times E_A = \frac{80}{100} \times 160 = 128V$$

