

# QUICK REFERENCE TABLES and Interesting Facts

## MIC/LINE CIRCUIT TYPES

**Balanced:** Audio signal consisting of the voltage difference between two conductors, neither of which is the shield; generally carried by a two-conductor-with-shield cable. There is no necessary relationship between the voltage on the conductors, and the ground potential of the shield. Balanced circuits are preferred over unbalanced circuits due to their ability to isolate ground and operate over long distances.

**Unbalanced:** Audio signal consisting of the voltage difference between a single conductor and shield (common, or ground). The audio signal is referenced to ground, requiring that the shield be connected at both source and destination, opening the possibility of amplifying induced hum and noise.

**High-Impedance:** Audio source or load impedance generally above 1000  $\Omega$ ; typically 5,000  $\Omega$  or greater. Common high impedance values are 10,000  $\Omega$ , 20,000  $\Omega$ , or 100,000  $\Omega$ . A high-impedance source can only feed a high impedance load or input.

**Low-Impedance:** Audio source or load impedance generally below 1000 Ohms; typically 600 Ohms or less. Common low impedance values are 600  $\Omega$ , 500  $\Omega$ , 150  $\Omega$ , 50  $\Omega$ . A low-impedance source can feed a high-impedance load without problems. Only a low-impedance source can feed a low-impedance input.

**Note:** RDL® products are generally designed with high-impedance inputs and low-impedance outputs, and can be connected balanced or unbalanced. This makes the product line inputs and outputs compatible with other modules and nearly all other equipment.

### POWER RELATIVE TO A.C. VOLTAGE

(AC Volts R.M.S. for Impedances in Ohms)

Power	2 $\Omega$	4 $\Omega$	6.3 $\Omega$	8 $\Omega$	12.5 $\Omega$	50 $\Omega$	100 $\Omega$	600 $\Omega$
1 W	1.41	2.00	2.51	2.83	3.54	7.07	10.00	24.49
2 W	2.00	2.83	3.55	4.00	5.00	10.00	14.14	34.64
3 W	2.45	3.46	4.35	4.90	6.12	12.25	17.32	42.43
6 W	3.46	4.90	6.15	6.93	8.66	17.32	24.49	60.00
10 W	4.47	6.32	7.94	8.94	11.18	22.36	31.62	77.46
20 W	6.32	8.94	11.22	12.65	15.81	31.62	44.72	109.54
30 W	7.75	10.95	13.75	15.49	19.36	38.73	54.77	134.16
50 W	10.00	14.14	17.75	20.00	25.00	50.00	70.71	173.21
100 W	14.14	20.00	25.1	28.28	35.36	70.71	100.00	244.95

### DECIBELS & VOLTAGE

dBu	R.M.S.	Peak-to-Peak
-60	0.775 mV	2.19 mV
-45	4.35 mV	12.31 mV
-35	13.8 mV	39.04 mV
-20	77.5 mV	219.24 mV
-10	245.0 mV	693.07 mV
0	775.0 mV	2.19 V
+4	1.23V	3.48 V
+10	2.45V	6.93V

### OHMS LAW AND POWER CALCULATION FORMULAS

$E=I \cdot R$        $I=E/R$        $R=E/I$        $P=I \cdot E$        $P=I^2 R$        $P=E^2/R$   
 E=Voltage (volts)      I=Current (Amps)      R=Resistance (Ohms)      P=Power (Watts)

### WIRE SIZES AND RESISTANCE

(Solid Copper Wire)

Gauge AWG	Diameter (Inches)	Resistance at 68 F Ohms/1000 Ft	Resistance at 68 F Feet/Ohm
4	0.2043	0.2485	4025.0
6	0.1620	0.3951	2531.0
8	0.1285	0.6282	1592.0
10	0.1019	0.9989	1001.0
12	0.08081	1.588	629.6
14	0.06408	2.525	396.0
16	0.05082	4.016	249.0
18	0.04030	6.385	156.5
20	0.03196	10.15	98.5
22	0.02535	16.14	61.95

### MACHINE SCREW DRILL SIZES

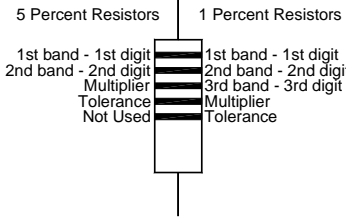
(Machine Screws, Drill Sizes for Clearance, Tap Holes, and Tap Sizes)

Screw Number	Threads Per Inch	Tap Size	Drill Number For Tap	Drill Number For Clearance
3	48	3 x 48	47	39
4	40	4 x 40	43	31
6	32	6 x 32	36	28
8	32	8 x 32	29	19
10	32	10 x 32	21	10

## STANDARD RESISTOR COLOR CODES

### 5-PERCENT RESISTORS

COLOR	DIGIT	MULTIPLIER	TOLERANCE
Black	0	1	--
Brown	1	10	--
Red	2	100	+/- 2%
Orange	3	1,000	--
Yellow	4	10,000	--
Green	5	100,000	--
Blue	6	1,000,000	--
Violet	7	10,000,000	--
Gray	8	--	--
White	9	--	--
Gold	--	0.1	+/- 5%

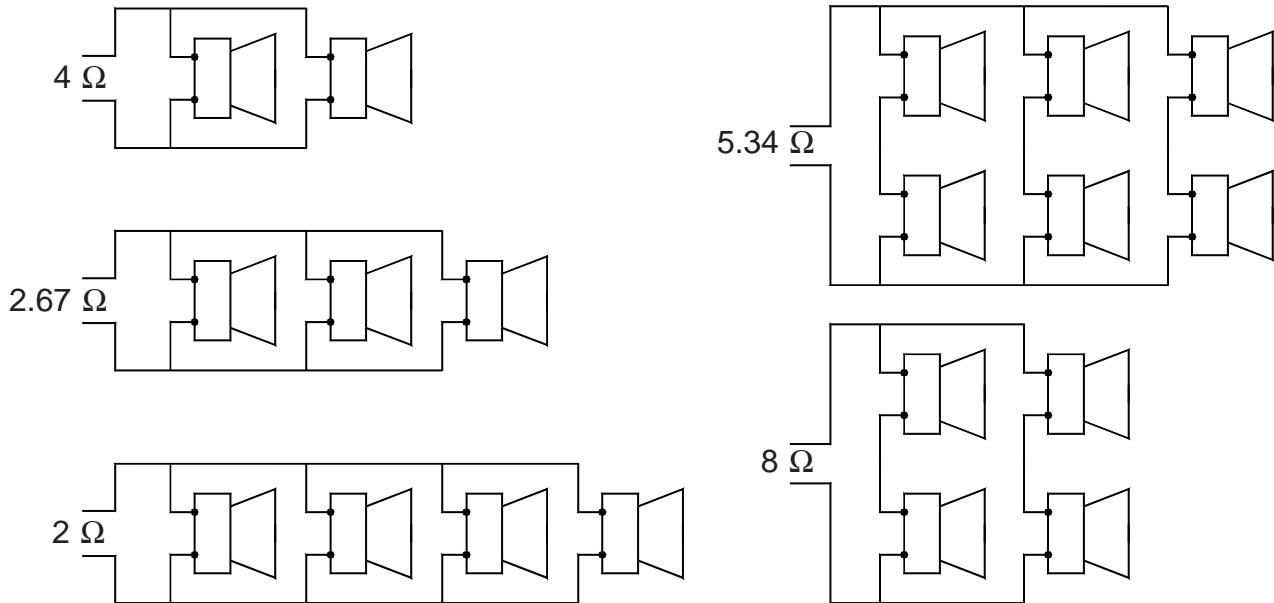


### 1-PERCENT RESISTORS

COLOR	DIGIT	MULTIPLIER	TOLERANCE
Black	0	1	--
Brown	1	10	+/- 2%
Red	2	100	--
Orange	3	1,000	--
Yellow	4	10,000	--
Green	5	100,000	--
Blue	6	1,000,000	--
Violet	7	10,000,000	--
Gray	8	--	--
White	9	--	--
Gold	--	0.1	--

## MULTIPLE SPEAKER INSTALLATIONS

(Shows System Impedance Using 8 Ω Speakers)



## COMMON PREFIXES USED IN ELECTRONICS

<u>Metric Prefix</u>	<u>Meaning</u>	<u>Associated with</u>
mega	million (1,000,000)	volts, ohms, hertz (cycles), amperes
kilo	thousand (1,000)	volts, ohms, hertz (cycles)
milli	one-thousandth (0.001)	volts, amperes, watts, ohms
micro	one-millionth (0.000,001)	volts, amperes, watts, ohms
pico	one-millionth of one-millionth	volts, amperes, farads

## COMMON CONVERSIONS USED IN ELECTRONICS

Centimeter = 0.3937 in.	Inch = 2.54 centimeters
Meter = 3.28 ft.	Foot = 0.3048 meter
Square centimeter = 0.155 sq. in.	Sq. in. = 6.45 sq. cm.
Gram = 0.0353 ounce	Oz. = 28.35 grams
Kilogram = 2.205 lb.	Lb. = 0.4536 kg.