unit 16

SERIES-PARALLEL CIRCUITS

16.1 Introduction

In this unit you will learn how to calculate total circuit resistance for series-parallel circuits.

16.2 Understanding Series-Parallel Circuits

A series-parallel circuit is one that contains some resistors in series and some in parallel. That portion of the circuit that includes resistors in series must comply with the rules for series circuits. That portion of the circuit that contains resistors in parallel must comply with the rules for parallel circuits. ▶Figure 16–1



[▶] Figure 16–1

To understand series-parallel circuits, we must review the rules for determining resistance for series and parallel circuits.

(A) Series Circuit Resistance. The total resistance of a series circuit is equal to the sum of the resistances. ▶Figure 16–2





(B) Parallel Circuit Resistance. The total resistance of a parallel circuit must be calculated with one of the three methods covered in the previous unit. ▶Figure 16–3

- Method 1. Equal Resistance
- Method 2. Product-Over-Sum
- Method 3. Reciprocal



▶Figure 16–3