

STAN GIBILISCO  
THE  
ILLUSTRATED  
DICTIONARY  
OF  
**Electronics**

**EIGHTH EDITION**

Audio/Video

Consumer Electronics

Wireless Technology

# **The Illustrated Dictionary of Electronics**

*This page intentionally left blank.*

# **The Illustrated Dictionary of Electronics**

Eighth Edition

*Stan Gibilisco*  
*Editor-in-Chief*

**McGraw-Hill**

New York Chicago San Francisco Lisbon London Madrid  
Mexico City Milan New Delhi San Juan Seoul  
Singapore Sydney Toronto

**McGraw-Hill**

*A Division of The McGraw-Hill Companies*



Copyright © 2001 by The McGraw-Hill Companies, Inc. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

1 2 3 4 5 6 7 8 9 0    AGM/AGM    0 9 8 7 6 5 4 3 2 1

P/N 0-07-137237-7

ISBN 0-07-137236-9

The sponsoring editor for this book was Scott Grillo, and the production supervisor was Pamela Pelton. It was set in Bookman by Techbooks.

Printed and bound by Quebecor/Martinsburg.

McGraw-Hill books are available at special quantity discounts to use as premiums and sales promotions, or for use in corporate training programs. For more information, please write to the Director of Special Sales, McGraw-Hill, Two Penn Plaza, New York, NY 10121-2298. Or contact your local bookstore

Information in this book has been obtained by the publisher from sources believed to be reliable. However, neither the publisher nor the authors guarantee the accuracy or completeness of any information published herein. Neither the publisher nor the authors shall be responsible for any errors, omissions, or damages arising out of use of this information. This work is published with the understanding that the publisher and authors are supplying information but are not attempting to render professional services in any way, shape or form. If such services are required, the assistance of an appropriate professional should be sought.



This book is printed on recycled, acid-free paper containing a minimum of 50 percent recycled de-inked fiber.

**sidetone telephone** A telephone set with no provision for canceling the sidetone.

**siemens** Symbol, S. The SI unit of conductance. The conductance of a component or medium in siemens is equal to the reciprocal of the resistance in ohms.

**Siemen's electrodymanometer** A spring-tension meter that operates by means of torque, with zero current through the device representing zero torque. It can be used for measurements of current, voltage, or power.

**Sierra** Phonetic alphabet code word for the letter S.  
**sig** Abbreviation of SIGNAL.

**sign** **1.** Any indicator denoting whether a value is positive or negative. **2.** A graphic device indicating an operation. Examples: + (addition), × (multiplication). **3.** Any symbol. An ampersand, for example, is an "and" sign. **4.** A characteristic symptom of malfunction or improper operation (e.g., a high standing-wave ratio in an antenna system is a sign of an impedance mismatch).

**signal** An electrical quantity, such as a current or voltage, that can be used to convey information for communication, control, calculation, etc.

**signal-actuated voice recorder** Abbreviation, SAVOR. A recorder that goes into operation automatically when the speaker starts talking and stops when the speaker finishes.

**signal amplitude** The intensity of a signal quantity (see SIGNAL).

**signal booster** See PREAMPLIFIER.

**signal channel** In a system, a channel through which only signals flow, control and modifying impulses being accommodated by other channels.

**signal circuit** A circuit handling signal currents and voltages to the exclusion of control and operating currents and voltages.

**signal conditioner** Any accessory device (such as a peak probe, demodulator probe, current shunt, etc.) used to modify or change the function of a basic instrument (such as an electronic voltmeter).

**signal converter** See CONVERTER, **1.**

**signal current** The current component of a signal, as opposed to operating current in a system.

**signal diode** A diode designed primarily for light-duty signal applications (detection, demodulation, modulation, curve changing), as opposed to the heavy-duty applications of power diodes and rectifiers.

**signal distance** In two words (bit groups) of the same length, the number of corresponding bit positions whose states differ. For example, the signal distance between 01001 and 10011 is 3.

**signal-flow analysis** A graphic method of analyzing circuits, particularly those using feedback, through the use of diagrams in which straight arrows represent transmission paths, dots represent nodes, and curved arrows represent feedback paths.

**signal-flow diagram** The transmission-path diagram used in SIGNAL-FLOW ANALYSIS.

**signal gain** The gain of an amplifier circuit—especially if used in small-signal applications. See also AMPLIFICATION, and GAIN.

**signal generator** An instrument that produces signals of precise frequency and amplitude, usually over a wide range.

**signal ground** **1.** Any circuit point that remains at zero signal potential. **2.** A connection to a point that is deliberately maintained at zero signal potential.

**signal/image ratio** See SIGNAL-TO-IMAGE RATIO.

**signaling** In a communications system, the exchange of data in electrical form, either analog or digital.

**signaling rate** In data communications, the speed at which data is transmitted. It is commonly expressed in bits per second (bps). Also, it is sometimes expressed in baud or in words per minute (wpm).

**signaling time slot** In a communications signal, a specified interval of time, starting at a certain instant in each signal frame. This interval is used exclusively for the purpose of signaling.

**signal injection** **1.** The introduction of a signal into a circuit. **2.** A method of troubleshooting in communications receivers. A signal generator is used to introduce a test signal into each stage, starting with the output and proceeding stage-by-stage toward the input, until the defective stage or component is located.

**signal injector** A simple (usually single-frequency) signal generator used in troubleshooting to introduce a test signal at selected points in a circuit, to locate malfunctioning stages or components. Also see SIGNAL INJECTION, **2.**

**signal intensity** See SIGNAL STRENGTH.

**signal inversion** Phase reversal of a signal passing through a circuit, device or medium.

**signal level** At a given point in a circuit, the strength of a signal, with respect to a reference amplitude.

**signal loss** **1.** A reduction in the amplitude of a signal as it passes through a system. **2.** The complete disappearance of a signal. **3.** See FRACTIONAL GAIN.

**signal mixer** See MIXER.

**signal/noise ratio** See SIGNAL-TO-NOISE RATIO.

**signal notcher** See NOTCH FILTER.

**signal peaker** See PEAK FILTER.

**signal power** The amplitude of a signal expressed in watts, milliwatts, or microwatts, as opposed to amplitude expressed as a current or voltage.

**signal processor** Any device, (e.g., preamplifier, expander, amplitude limiter, delay network) inserted into or added onto a system to modify an input or output signal.

**signal rectification** The conversion of an alternating-current signal into a proportionate direct-current signal, usually by means of a diode circuit.

**transient suppressor** See SURGE ARRESTOR.

**transient voltage** A momentary pulse of voltage. Also see TRANSIENT.

**transient voltmeter** An instrument that indicates the voltage of momentary signals. Usually, a peak-reading meter in the instrument displays the highest positive or negative value the transient attains (sometimes holding the deflection for reading later) and can respond to pulses of 1 microsecond in duration.

**transistor** An active (commonly three-terminal) semiconductor device capable of amplification, oscillation, and switching action. The name is a contraction of *transfer resistor*. Also see ALLOY-DIFFUSED TRANSISTOR, ALLOY TRANSISTOR, BIPOLAR TRANSISTOR, DIFFUSED-BASE TRANSISTOR, DIFFUSED-EMITTER-AND-BASE TRANSISTOR, DIFFUSED-JUNCTION TRANSISTOR, DIFFUSED MESA TRANSISTOR, DIFFUSED PLANAR TRANSISTOR, DIFFUSED TRANSISTOR, DIFFUSION TRANSISTOR, DOUBLE-BASE JUNCTION TRANSISTOR, FIELD-EFFECT TRANSISTOR, FIELDISTOR, GERMANIUM TRANSISTOR, GROWN-DIFFUSED TRANSISTOR, GROWN-JUNCTION TRANSISTOR, JUNCTION TRANSISTOR, MESA TRANSISTOR, METAL-OXIDE-SEMICONDUCTOR FIELD-EFFECT TRANSISTOR, MICROALLOY DIFFUSED TRANSISTOR, MICROALLOY TRANSISTOR, PHOTOTRANSISTOR, PLANAR EPITAXIAL PASSIVATED TRANSISTOR, PLANAR TRANSISTOR, POINT-CONTACT TRANSISTOR, POWER TRANSISTOR, SILICON TRANSISTOR, SURFACE-BARRIER TRANSISTOR, SURFACE-CHARGE TRANSISTOR, TANDEM TRANSISTOR, THIN-FILM TRANSISTOR, THREE-JUNCTION TRANSISTOR, and UNI-JUNCTION TRANSISTOR.

**transistor amplifier** An amplifier containing only transistors as the active components. Also called *transistorized amplifier*.

**transistor analyzer** An instrument for measuring the electrical characteristics of transistors. Compare TRANSISTOR TESTER.

**transistor battery** A 9-volt electrochemical battery consisting of six tiny zinc-carbon or alkaline cells in series. Each of the six cells supplies 1.5 volts. The ampere-hour capacity is small. The battery has a characteristic box shape with adjacent clip-on terminals at one end. These batteries are used in low-current electronic devices such as remote-control garage-door openers, television channel changers, remote videocassette recorder (VCR) controls, electronic calculators, and smoke detectors.

**transistor-coupled logic** Abbreviation, TCL. In computer and automatic-control operations, logic circuitry and systems using multi-emitter-coupled transistors. Also see RESISTOR-TRANSISTOR LOGIC and TRANSISTOR-TRANSISTOR LOGIC.

**transistor current meter** An ammeter, milliammeter, or microammeter circuit containing an amplifier using only transistors. Also see ELECTRONIC CURRENT METER.

**transistorized voltmeter** See TRANSISTOR VOLT-METER.

**transistorized volt ohmmeter** An electronic voltmeter-ohmmeter combination using a transistorized circuit similar to that of a vacuum-tube volt ohmmeter.

**transistor keyer** A power transistor acting as a keying device.

**transistor oscillator** An oscillator using only transistors as the active components. Also called *transistorized oscillator*.

**transistor power supply** A high-current, well-filtered, direct-current power supply for operating transistor circuits.

**transistor radio** Any small, portable, battery-powered radio receiver whose active components are transistors and/or other semiconductor devices.

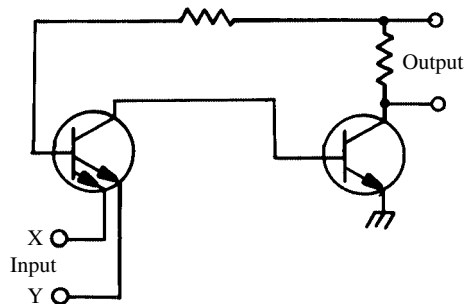
**transistor-resistor logic** See RESISTOR-TRANSISTOR LOGIC.

**transistor tester** An instrument for checking the condition of transistors (i.e., whether good or bad). Compare TRANSISTOR ANALYZER.

**transistor tetrode** See DOUBLE-BASE JUNCTION TRANSISTOR.

**transistor thyatron** See SOLID-STATE THYRATRON.

**transistor-transistor logic** Abbreviation, TTL or T<sup>2</sup>L. In computer operations, a circuit in which the multiple-diode cluster of the diode-transistor logic circuit has been replaced by a multiple-emitter transistor.



transistor-transistor logic

**transistor voltmeter** Abbreviation, TVM. A voltmeter containing an amplifier that uses only bipolar transistors. Also called *transistorized voltmeter*. Also see ELECTRONIC VOLT-METER. Compare FET VOLT-METER and VACUUM-TUBE VOLT-METER.

**transistor VOM** See TRANSISTORIZED VOLT-OHMMETER.