

## **EXHIBIT 14**

MODERN  
DICTIONARY  
of  
**ELECTRONICS**

SEVENTH EDITION  
REVISED AND UPDATED


**Rudolf F. Graf**



Boston Oxford Auckland Johannesburg Melbourne New Delhi


Newnes is an imprint of Butterworth-Heinemann.


Copyright © 1999 by Rudolf F. Graf

 A member of the Reed Elsevier Group.

All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

 Recognizing the importance of preserving what has been written, Butterworth-Heinemann prints its books on acid-free paper whenever possible.

 Butterworth-Heinemann supports the efforts of American Forests and the Global ReLeaf program in its campaign for the betterment of trees, forests, and our environment.

#### Library of Congress Cataloging-in-Publication Data

Graf, Rudolf F.

Modern dictionary of electronics / Rudolf F. Graf. — 7th ed., revised and updated.

p. cm.

ISBN 0-7506-9866-7 (alk. paper)

1. Electronics — Dictionaries. I. Title

TK7804.G67 1999

621.381'03 — dc21

99-17889

CIP

REF.  
TK  
7804  
G67  
1999 - Oct. 01

#### British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library.

The publisher offers special discounts on bulk orders of this book.

For information, please contact:

Manager of Special Sales

Butterworth-Heinemann

225 Wildwood Avenue

Woburn, MA 01801-2041

Tel: 781-904-2500

Fax: 781-904-2620

For information on all Butterworth-Heinemann publications available, contact our World Wide Web home page at: <http://www.bh.com>

10 9 8 7 6 5 4 3 2 1

Typeset by Laser Words, Madras, India

Printed in the United States of America

**micrographics**—The use of microfilm and microfiche for filing basic documents that must be retained and made available for infrequent use. Special computer software can be used to maintain an index of such documents and to aid in their retrieval.

**microgroove**—In disc recording, the groove width of most long-play and 45-rpm records. Normally it is 0.001 inch (25.4  $\mu\text{m}$ ), or about half as wide as the groove on a 78-rpm record. (No longer manufactured.)

**microgroove record**—See long-play record.

**microhenry**—One millionth of a henry.

**microhm**—One millionth of an ohm.

**microinstruction**—Also called elementary operation, cycle, or function. 1. A very simple instruction (typically a register-to-register copy). 2. A bit pattern that is stored in a microprogram memory word and specifies the operation of the individual LSI computing elements and related subunits, such as main memory and input/output interfaces.

**microinstruction sequence**—The series of microinstructions that the microprogram control unit (MCU) selects from the microprogram to execute a single macroinstruction or control command. Microinstruction sequences can be shared by several macroinstructions.

**microlock**—A phase-lock loop system for transmitting and receiving information. Because the system reduces bandwidth drastically, it is used as a radar beacon for tracking, or to provide telemetering data.

**micrologic elements**—1. A group of high-speed, low-powered integrated logic building blocks primarily intended to be used in building the logic section of a digital computer. 2. Semiconductor networks used in computer and other critical circuits.

**micromanipulators**—Devices that provide means for accurately moving miniscule tools over and onto the surface of a microscopic object.

**micromassage**—See intercellular massage.

**micrometer**—One millionth of a meter.

**micromho**—One millionth of a mho or of a siemens. Replaced by microsiemens.

**micromicro**—An obsolete prefix meaning one millionth of a millionth, or  $10^{-12}$ . Now called pico-.

**micromicrofarad**—Obsolete term for  $10^{-12}$  farad. Now called picofarad.

**micromicrowatt**—Obsolete term for  $10^{-12}$  watt. Now called picowatt.

**microminiature lamp**—Any incandescent lamp, usually rated in the milliwatt range, that operates on 3 volts or less. Diameters range from 0.01 to 0.06 inch, or 0.25 to 1.5 mm.

**microminiaturization**—1. The producing of microminiature electronic circuits from individual miniature solid-state and other nonthermionic components. 2. A relative degree of miniaturization resulting in an equipment or assembly volume an order of magnitude smaller than that existing in subminiature equipment. 3. The technique of packaging a microminiature part of an assembly composed of elements radically different in shape and form. Electronic parts are replaced by active and passive elements through use of fabrication processes such as screening, vapor-deposition diffusion, and photoetching. 4. The process of packaging an assembly of microminiature active and passive electronic elements, replacing an assembly of much and different parts.

**micromodule**—1. A tiny ceramic wafer made from semiconductive and insulative materials. It is capable of functioning as either a transistor, resistor, capacitor, or other basic component. 2. A microcircuit constructed of a number of components (e.g., microwafers) and

## micrographics — microphonoscope

encapsulated to form a block that is still only a fraction of an inch in any dimension.

**micron**—1. An absolute unit of length equal to  $10^{-6}$  meter. The term micrometer is now preferred. 2. A unit used in the measurement of very low pressures. It is equivalent to 0.001 mm ( $10^{-6}$  meter) of mercury at 32°F or 0°C.

**microphone**—1. An electroacoustic transducer that responds to sound waves and delivers essentially equivalent electric waves. 2. A device for converting sound waves or sound-producing vibrations (as from the strings of a guitar) into corresponding electrical impulses. Microphones may use as transducing elements crystal or ceramic chips, ribbons, moving coils, or capacitors, and different recording applications may call for different transducers as well as for different directional patterns and impedances.

**microphone amplifier**—Also called a microphone preamplifier. An audio-frequency amplifier that boosts the output of a microphone before the signal reaches the main audio-frequency amplifier.

**microphone boom**—A movable crane from which a microphone is suspended.

**microphone button**—The resistance element of a carbon microphone. It is button-shaped and filled with carbon particles.

**microphone cable**—A shielded cable for connecting a microphone to an amplifier.

**microphone mixer**—An audio mixer that feeds the output from two or more microphones into a single input to an audio amplifier. The output from each microphone is adjustable by individual controls on the mixer.

**microphone preamplifier**—See microphone amplifier.

**microphone sensitivity**—The voltage that is produced by a microphone that is exposed to a specified sound pressure level. Usually specified in dBV in a 94 dB sound pressure level (spl) or 74 dB spl sound field, measured with no load on the microphone.

**microphone stand**—A stand that holds a microphone the desired distance above the floor or a table.

**microphone transformer**—An iron-core transformer used for coupling certain microphones to an amplifier or transmission line.

**microphonics**—1. The generation of an electrical noise signal by mechanical motion of internal parts within a device. 2. Electrical disturbance (noise) due to mechanical disturbances of circuit elements. 3. A form of noise interference arising from the tendency for vibrations of certain objects to be converted into corresponding electrical signals. A microphonic device will cause a "bong" or "bing" in the signal when subjected to jarring. 4. Audio-frequency noise caused by the mechanical vibration of elements within a system or component. 5. Microphone noise that occurs in lasers when vibrations are transferred to the resonator structure.

**microphonism**—1. The production of noise as a result of mechanical shock or vibration. 2. The quasiperiodic voltage output of a tube produced by mechanical resonance of its elements as a result of mechanical impulse excitation. 3. The periodic voltage output of a tube produced by mechanical resonances of its elements as a result of sustained mechanical excitation. 4. The output voltage of a tube acting as an electrical transducer of mechanical energy.

**microphonograph**—A device that amplifies and records weak sounds; used in training the deaf to speak.

**microphonoscope**—A binaural stethoscope using a membrane in the chest piece to accentuate the sound.