

MODERN
DICTIONARY
of
ELECTRONICS

Rudolf F. Graf

SIXTH EDITION

name is familiar to engi-
and hobbyists. His many
electricity, electronics and
utation for making com-
and enjoyable. Mr. Graf
received his MBA at New
er of the IEEE, a licensed
of a first-class radiotele-
a the electronics industry

SAMS

*A Division of Prentice Hall Computer Publishing
11711 North College, Carmel, Indiana 46032 USA*

IPB-BCM_00024979

IP Bridge Exhibit 2002

Sci/Ref TK 7804 .667 1984
Graf, Rudolf F.
Modern dictionary of
electronics

© 1962, 1963, 1968, 1972, 1977, and 1984
by Rudolf F. Graf

Sixth Edition
Seventh Printing—1992

1/10/94

All rights reserved. No part of this book shall be reproduced, stored in a retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from the publisher. No patent liability is assumed with respect to the use of the information contained herein. While every precaution has been taken in the preparation of this book, the publisher assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

International Standard Book Number: 0-672-22041-5

Library of Congress Catalog Card Number: 83-51223

Edited by: *Charlie Buffington* and *Jack Davis*
Illustrated by: *T.R. Emrick*

Printed in the United States of America.

100-200-1000

600

the edge of the dielectric is wound.

rating at the borderland limits of voltage, current, When operation is marginal impairment can cause them to fail.

ing—Also called marginal preventive maintenance in operating conditions (e.g., or frequency) are varied in order to locate defects before serious.

—A relay with a small in its nonoperative current in current applicable without and its operative value current that operates the

ing—See Marginal Check-

ed card—A card in which ing data are punched only with the center left free for ed information.

ast station—A coastal regularly broadcasts the orological and hydrograph-

beacon station—A land station, the emis-ich are used to determine direction of a ship in rela-ive radiobeacon station.

ile service—The radio ser-ships communicate with with coastal and other land cified frequencies.

ionavigation service—A ntended to be used for the hips.

legraphy, the closed-circuit , the signal that closes the eceiver to produce a click of r to print a character on a

. 2. The presence of signal. se is equivalent to a binary which originated with tele-ate a closed key condition.

implies the presence of cur-on a circuit or the idle con-ypewriter. It also indicates

igit one in computer lan-ig. 1. 4. In rtty applications, e of two states. The mark is

characterized by a closed space, the other state, is by an open-circuit con-

ace impulses—In neutral a teletypewriter system, the

is the closed-circuit signal, : impulse is the open-circuit her than neutral operation,

ulse is the circuit condition s the same result in the ter-ment that a mark impulse

601

produces in neutral operation. Similarly, the space impulse is the circuit condition that produces the same result in the terminal equipment that a space impulse produces in neutral operation.

marker—Also called marker beacon. A radio navigational aid consisting of a transmitter that sends a signal to designate the small area around and above it.

marker antenna—The transmitting antenna for a marker beacon.

marker beacon—See Marker.

marker generator—An rf generator that injects one or more pips of specific frequency onto the response curve of a tuned circuit being displayed on the screen of a cathode-ray oscilloscope.

marker pip—The inverted V (Λ) or spot of light used as a frequency index mark in cathode-ray oscilloscopes for alignment of tv sets. It is produced by coupling a fixed-frequency oscillator to the output of a sweep-driven signal generator.

marker thread—A colored thread laid parallel and adjacent to the strands of an insulated conductor which identifies the wire manufacturer and often the specification under which the wire is constructed.

marking-and-spacing intervals—In telegraphy, the intervals corresponding to the closed and open positions, respectively, of the originating transmitting contacts.

marking bias—Bias that affects the results in the same direction they are affected by marking current.

marking current—The magnitude and polarity of line current when the receiving mechanism is in the operated condition.

marking pulse—The signal interval during which the selector unit of a teletypewriter is operated.

marking wave—Also called keying wave. In telegraphy, the emission while the active portions of the code characters are being transmitted.

mark sense—1. To mark a position on a punch card, using a special pencil that leaves an electrically conductive deposit for later conversion to machine punching.

2. A mechanized technique of punching data into computer cards. A graphite line positioned on the card is read electronically and converted into holes by special equipment.

mark-sense card—A card designed to permit data to be entered on it with an electrographic pencil.

mark sensing—A technique for detecting special pencil marks entered in special places on a card and automatically translating the marks into punched holes.

mark-to-space transition—The change from a marking impulse to a spacing impulse.

marker—mask

marshalling sequence—See Collating Sequence, 1.

maser—1. Acronym for microwave amplifier by stimulated emission of radiation. A low-noise microwave amplifier in which a signal is boosted by changing the energy level of a gas or crystal (commonly, ammonia or ruby, respectively). 2. A means of focusing a stream of particles, which concentrates only on the high-energy particles. These are passed into a resonator which is resonating at the radiation frequency of the particles. The particles are in this state raised to a strong oscillation, and can be used for control purposes. By reducing the flow of particles to the resonator, to maintain oscillations, it can be used as an amplifier. (There are many other applications). 3. Device for amplifying a microwave frequency signal by "stimulated emission of radiation"—i.e., the weak microwave signal causes electrons in an atom to change orbit in such a manner as to emit an amplified signal of the same frequency as the weak signal.

mask—1. A frame mounted in front of a television picture tube to limit the viewing area of the screen. 2. A device (usually a thin sheet of metal which contains an open pattern) used to shield selected portions of a base during a deposition process. 3. A device used to shield selected portions of a photosensitive material during photographic processing. 4. A logical technique in which certain bits of a word are blanked out or inhibited. 5. Template used to etch circuit patterns on semiconductor wafers. Images of the circuit patterns are produced on glass or metal photographically. The mask is then used to control the diffusion process, plus metallization. 6. A chrome or glass plate having the transparent circuit patterns of a single layer of a wafer. Masks are used in the defining of patterns on the surface of a resist-covered wafer. 7. Thin metals or other materials with an open pattern designed to mask off or shield selected portions of semiconductors or other surfaces during deposition processes. There also are photomasks or optical masks for contact or projection printing of wafers; these may use an extremely flat glass substrate with iron oxide, chrome, or emulsion coating. There also are thick-film screen masks. 8. The photographic negative that serves as the master for making thick-film screens and thin-film patterns. 9. The pattern, usually "printed" on glass, used to define areas of the chip or wafer. Masks are used for the diffusion, oxidation, and metallization steps used in manufacturing of semiconductors. 10. To hide, to obscure, to make less noticeable. For example, as noise masks crosstalk. 11. A material applied to enable selective etching,

etching, plating, or the application of solder to a printed board. Also, the surface on which the master artwork of the circuit pattern is projected. 12. A thin steel arrangement with fine holes (shadow mask) or stripes (slot mask) that concentrates the electron beam at points on the crt.

masked diffusion — The use of a mask pattern to obtain selective impregnation of portions of a semiconductor material with impurity atoms.

masked ROM — A regular ROM produced by the usual masking process. (Contrasted with a PROM.)

masking — The process by which a sound is made audible by the addition of a second sound called the masking sound. The unit of measurement is usually the decibel.

masking audiogram — A graphical representation of the amount of masking by a noise. It is plotted in decibels as a function of the frequency of the masked tone.

mask microphone — A microphone designed for use inside an oxygen or other respiratory mask.

mask set — A set of plates, usually glass, which are used to transfer a device topology in sequence to a wafer during fabrication.

Masonite — Trade name of the Masonite Corp. Fiberboard made from steam-exploded wood fiber. Its highly compressed forms are used for panels in electrical equipment.

mass — 1. The quantity of matter in an object. It is equal to the weight of a body divided by the acceleration due to gravity. 2. The bulk of matter though not necessarily equal to its weight. A mechanical unit whose electrical analog is inductance.

mass data — A larger amount of data than can be stored in the central processing unit of a computer at any one time.

mass-memory unit — A drum or disk memory that provides rapid-access bulk storage for messages being held until outgoing channels are available.

mass properties — Calculation of physical engineering information about a part, e.g., perimeter, area, volume, weight, and moments of inertia.

mass radiator — A spark radiator which generates a low-level, broadband signal extending into and above the hf band. Arcing occurs between fine metal particles suspended in a liquid dielectric.

mass spectrometer — An instrument that permits rapid analysis of chemical compounds. It consists of a vacuum tube into which a small amount of the gas to be studied is admitted. The gas is ionized by the electrons emitted from the cathode and speeded up by an accelerating grid. An electric field draws the ions out of the

ionizing chamber. They are then sent through electric and magnetic fields that sort them according to their ratios of mass to charge.

mass spectrum — The spectrum obtained by deflecting a beam of electrons with an electric or magnetic field as they emerge from a tube containing a small quantity of the gas being investigated. The amount a particle is deflected depends on the ratio of its mass to its atomic charge. Hence, every element has a characteristic mass-spectrum line.

mass storage — 1. Refers to hardware devices providing massive amounts of on-line secondary storage, generally using strips of inexpensive magnetic media which can be accessed randomly, but with slower access times than those of conventional tape or disk devices. 2. Refers to peripheral devices into which programs and data are stored for immediate action. 3. In a computer, secondary, slower memory for bulky files. Mostly floppy-disk, cassette, or tape. 4. Auxiliary memories, generally containing magnetic media, which are used to supplement the main memory of a computer. It is less expensive than main memory per unit of information stored but it is slower to access. Examples include magnetic tape, magnetic disk, and flexible disk. 5. Auxiliary or bulk memory that can store large amounts of data readily accessible to the computer, e.g., a disk or magnetic tape.

mass termination — The simultaneous termination of several or all conductors of a cable. This process generally uses terminals that pierce the insulation without stripping to cold-flow mate with the conductors and form a gas-tight metal-to-metal joint. See Insulation Displacement Connector.

mast — The pole on which an antenna is mounted.

master — 1. The mold from which other disc recordings are cast. It is made by electroforming from a disc recording, and is a "negative" of the disc (i.e., has ridges instead of grooves). 2. An original, or first special copy, of a recorded performance from which other copies may be made. 3. An original recording, made directly from recording microphones. A disc master is the lacquer original, usually cut from a tape from which stampers are made for vinyl pressings. 4. An element of a system that controls or initiates the action or responses of the other elements of the system.

master brightness control — In a color television receiver, a variable resistor that adjusts the bias level on all three guns in the picture tube at the same time.

master clock — 1. In a computer, the primary source of timing signals. 2. A very accurate timer with an absolute time