

McGraw-Hill Dictionary of ELECTRONICS AND COMPUTER TECHNOLOGY

Sybil P. Parker
Editor in Chief

McGraw-Hill Book Company

New York St. Louis San Francisco

Auckland	Bogotá	Guatemala	Hamburg	
Johannesburg	Lisbon	London	Madrid	Mexico
Montreal	New Delhi	Panama	Paris	San Juan
São Paulo	Singapore	Sydney	Tokyo	Toronto

**McGRAW-HILL DICTIONARY OF ELECTRONICS AND
COMPUTER TECHNOLOGY**

The material in this Dictionary has been published previously in the McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS, Third Edition, copyright © 1984 by McGraw-Hill, Inc. All rights reserved. Philippines copyright 1984 by McGraw-Hill, Inc. 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 D O D O 8 9 1 0 9 8 7 6 5 4

ISBN 0-07-045416-7

Library of Congress Cataloging in Publication Data

McGraw-Hill dictionary of electronics and computer technology.

1. Electronics—Dictionaries. 2. Computers—Dictionaries. 3. Electronic data processing—Dictionaries.

I. Parker, Sybil P. II. McGraw-Hill Book Company.

III. Title: Electronics and computer technology.

TK7804.M4 1984 621.381'03'21 84-12211

ISBN 0-07-045416-7

McGraw-Hill
Dictionary of
ELECTRONICS
AND
COMPUTER
TECHNOLOGY

Preface

Today's world of high technology can be directly attributed to the rapid developments in electronics that have dominated science, engineering, and business during the last 35 years. Of all the electronic devices, computers are one of the most outstanding. Therefore, a thorough understanding of computer technology is based largely on the language of electronics, which in turn involves the fundamental principles of electricity and solid-state physics.

There are many dictionaries that define only the terminology used in electronics, and others that focus on the specialized jargon of computer hardware and software. The *McGraw-Hill Dictionary of Electronics and Computer Technology* is, however, a unique compilation of terms and definitions that explain the basic scientific and technical principles of all relevant disciplines—electricity, electronics, solid-state physics, and computers.

The 10,000 terms and definitions were selected from the *McGraw-Hill Dictionary of Scientific and Technical Terms* (3d ed., 1984). Synonyms, acronyms, and abbreviations are given both with the definitions and in the alphabetical sequence as cross-references to the defining terms.

The *McGraw-Hill Dictionary of Electronics and Computer Technology* presents an integrated approach to the contributory fields in order to serve as a fully comprehensive reference tool for anyone who needs to communicate in the language of electronics.

Sybil P. Parker
EDITOR IN CHIEF

Editorial Staff

Sybil P. Parker, Editor in Chief

Jonathan Weil, Editor
Betty Richman, Editor

Edward J. Fox, Art director

Ann D. Bonardi, Art production supervisor

Joe Faulk, Editing manager

Ann Jacobs, Editing supervisor
Frank Kotowski, Jr., Editing supervisor
Patricia W. Albers, Senior editing assistant

Consulting and Contributing Editors

from the McGraw-Hill Dictionary of Scientific and Technical Terms

Dr. Patrick Barry—Senior Staff Scientist, Grumman Aerospace Corporation, Bethpage, New York. CONTROL SYSTEMS.

Prof. George S. Bonn—Formerly, Graduate School of Library Science, University of Illinois. LIBRARY CONSULTANT.

Prof. Roland H. Good, Jr.—Department of Physics, Pennsylvania State University. PHYSICS.

Phillip B. Jordain—Senior Research Officer, First National City Bank of New York. COMPUTERS.

John Markus—Author and Consultant. ELECTRONICS.

How to Use the Dictionary

ALPHABETIZATION

The terms in the *McGraw-Hill Dictionary of Electronics and Computer Technology* are alphabetized on a letter-by-letter basis; word spacing, hyphen, comma, solidus, and apostrophe in a term are ignored in the sequencing. For example, an ordering of terms would be:

read-around ratio

Read diode

reader

read error

readout

read/write channel

CROSS-REFERENCING

A cross-reference entry directs the user to the defining entry. For example, the user looking up “read-back check” finds:

read-back check *See* echo check.

The user then turns to the “E” terms for the definition.

Cross-references are also made from variant spellings, acronyms, abbreviations, and symbols.

I-f *See* intermediate frequency.

mG *See* milligauss.

RAM *See* random-access memory.

The user turning directly to a defining entry will find the above type of information included, introduced by “Also known as . . .,” “Also spelled . . .,” “Abbreviated . . .,” “Symbolized . . .,” “Derived from . . .”

A

a *See* ampere.

A *See* ampere.

aA *See* abampere.

A AND NOT B gate *See* AND NOT gate.

abampere The unit of electric current in the electromagnetic centimeter-gram-second system; 1 abampere equals 10 amperes in the absolute meter-kilogram-second-ampere system. Abbreviated aA. Also known as Bi; biot.

A battery The battery that supplies power for filaments or heaters of electron tubes in battery-operated equipment.

ABC *See* automatic brightness control.

abcoulob The unit of electric charge in the electromagnetic centimeter-gram-second system, equal to 10 coulombs. Abbreviated aC.

abend An unplanned program termination that occurs when a computer is directed to execute an instruction or to process information that it cannot recognize. Also known as bomb; crash.

abfarad A unit of capacitance in the electromagnetic centimeter-gram-second system equal to 10^9 farads. Abbreviated aF.

abhenry A unit of inductance in the electromagnetic centimeter-gram-second system of units which is equal to 10^{-9} henry. Abbreviated aH. Also known as centimeter.

abmho A unit of conductance in the electromagnetic centimeter-gram-second system of units equal to 10^9 mhos. Abbreviated $(a\Omega)^{-1}$. Also known as absiemens (aS).

abnormal glow discharge A discharge of electricity in a gas tube at currents somewhat higher than those of an ordinary glow discharge, at which point the glow covers the entire cathode and the voltage drop decreases with increasing current.

abnormal statement An element of a FORTRAN V (UNIVAC) program which specifies that certain function subroutines must be called every time they are referred to.

abohm The unit of electrical resistance in the centimeter-gram-second system; 1 abohm equals 10^{-9} ohm in the meter-kilogram-second system. Abbreviated a Ω .

abrupt junction A *pn* junction in which the concentration of impurities changes suddenly from acceptors to donors.

abs A special function occurring in ALGOL, which yields the absolute value, or modulus, of its argument.

absiemens *See* abmho.

absolute address The numerical identification of each storage location which is wired permanently into a computer by the manufacturer.

absolute addressing The identification of storage locations in a computer program by their physical addresses.

absolute code A code used when the addresses in a program are to be written in machine language exactly as they will appear when the instructions are executed by the control circuits.

absolute electrometer A very precise type of attracted disk electrometer in which the attraction between two disks is balanced against the force of gravity.

absolute programming Programming with the use of absolute code.

absolute-value computer A computer that processes the values of the variables rather than their increments.

absorber A material or device that takes up and dissipates radiated energy; may be used to shield an object from the energy, prevent reflection of the energy, determine the nature of the radiation, or selectively transmit one or more components of the radiation.

absorption The property of a dielectric in a capacitor which causes a small charging current to flow after the plates have been brought up to the final potential, and a small discharging current to flow after the plates have been short-circuited, allowed to stand for a few minutes, and short-circuited again. Also known as dielectric soak.

absorption circuit A series-resonant circuit used to absorb power at an unwanted signal frequency by providing a low impedance to ground at this frequency.

absorption control *See* absorption modulation.

absorption current The component of a dielectric current that is proportional to the rate of accumulation of electric charges within the dielectric.

absorption modulation A system of amplitude modulation in which a variable-impedance device is inserted in or coupled to the output circuit of the transmitter. Also known as absorption control; loss modulation.

absorption wavemeter A frequency- or wavelength-measuring instrument consisting of a calibrated tunable circuit and a resonance indicator.

abstract automata theory The mathematical theory which characterizes automata by three sets: input signals, internal states, and output signals; and two functions: input functions and output functions.

abvolt The unit of electromotive force in the electromagnetic centimeter-gram-second system; 1 abvolt equals 10^{-8} volt in the absolute meter-kilogram-second system. Abbreviated aV.

abwatt The unit of electrical power in the centimeter-gram-second system; 1 abwatt equals 1 watt in the absolute meter-kilogram-second system.

ac *See* alternating current.

aC *See* abcoulomb.

accelerated test A test of the serviceability of an electric cable in use for some time by applying twice the voltage normally carried.

accelerating electrode An electrode used in cathode-ray tubes and other electron tubes to increase the velocity of the electrons that contribute the space current or form a beam.

accelerating potential The energy potential in electron-beam equipment that imparts additional speed and energy to the electrons.

acceleration error constant The ratio of the acceleration of a controlled variable of a servomechanism to the actuating error when the actuating error is constant.

acceleration time The time required for a magnetic tape transport or any other mechanical device to attain its operating speed.

acceleration voltage The voltage between a cathode and accelerating electrode of an electron tube.

accentuation The enhancement of signal amplitudes in selected frequency bands with respect to other signals.

accentuator A circuit that provides for the first part of a process for increasing the strength of certain audio frequencies with respect to others, to help these frequencies override noise or to reduce distortion. Also known as accentuator circuit.

accentuator circuit *See* accentuator.

accept A data transmission statement which is used in FORTRAN when the computer is in conversational mode, and which enables the programmer to input, through the teletypewriter, data the programmer wishes stored in memory.

acceptor An impurity element that increases the number of holes in a semiconductor crystal such as germanium or silicon; aluminum, gallium, and indium are examples. Also known as acceptor impurity; acceptor material.

acceptor atom An atom of a substance added to a semiconductor crystal to increase the number of holes in the conduction band.

acceptor circuit A series-resonant circuit that has a low impedance at the frequency to which it is tuned and a higher impedance at all other frequencies.

acceptor impurity *See* acceptor.

acceptor material *See* acceptor.

access The reading of data from storage or the writing of data into storage.

access arm The mechanical device which positions the read/write head on a magnetic storage unit.

access-control register A storage device which controls the word-by-word transmission over a given channel.

access-control words Permanently wired instructions channeling transmitted words into reserved locations.

access gap *See* memory gap.

access mechanism The mechanism of positioning reading or writing heads onto the required tracks of a magnetic disk.

access method A set of programming routines which links programs and the data that these programs transfer into and out of memory.

access mode A programming clause in COBOL which is required when using a random-access device so that a specific record may be read out of or written into a mass storage bin.

4 access time

access time The time period required for reading out of or writing into the computer memory.

acordion cable A flat, multiconductor cable prefolded into a zigzag shape and used to make connections to movable equipment such as a chassis mounted on pullout slides.

accounting machine A machine that produces tabulations or accounting records of a specified unvarying format.

accounting package A set of special routines that allow collection of information about the usage level of various components of a computer system by each production program.

accumulated total punching A checking procedure to ensure that no punch-card item has been dropped from a file.

accumulating reproducer An electromechanical device which reads a sorted deck of cards and creates a set of subtotals on additional cards according to some preset criterion.

accumulator A specific register, in the arithmetic unit of a computer, in which the result of an arithmetic or logical operation is formed; here numbers are added or subtracted, and certain operations such as sensing, shifting, and complementing are performed. Also known as accumulator register; counter.

accumulator jump instruction An instruction which programs a computer to ignore the previously established program sequence depending on the status of the accumulator. Also known as accumulator transfer instruction.

accumulator register *See* accumulator.

accumulator shift instruction A computer instruction which causes the word in a register to be displaced a specified number of bit positions to the left or right.

accumulator transfer instruction *See* accumulator jump instruction.

accuracy control system Any method which attempts error detection and control, such as random sampling and squaring.

ac/dc receiver A radio receiver designed to operate from either an alternating- or direct-current power line. Also known as universal receiver.

acorn tube An ultra-high-frequency electron tube resembling an acorn in shape and size.

acoustic amplifier A device that amplifies mechanical vibrations directly at audio and ultrasonic frequencies. Also known as acoustoelectric amplifier.

acoustic bridge A device, based on the principle of the electrical Wheatstone bridge, used for analysis of deafness.

acoustic convolver *See* convolver.

acoustic delay line A device in which acoustic signals are propagated in a medium to make use of the sonic propagation time to obtain a time delay for the signals. Also known as sonic delay line.

acoustic detector The stage in a receiver at which demodulation of a modulated radio wave into its audio component takes place.

acoustic memory A computer memory that uses an acoustic delay line, in which a train of pulses travels through a medium such as mercury or quartz.

acoustic mode The type of crystal lattice vibrations which for long wavelengths act like an acoustic wave in a continuous medium, but which for shorter wavelengths approach the *Debye frequency*, showing a dispersive decrease in phase velocity.

acoustic phonon A quantum of excitation of an acoustic mode of vibration.

acoustic receiver The complete equipment required for receiving modulated radio waves and converting them into sound.

acoustic-wave amplifier An amplifier in which the charge carriers in a semiconductor are coupled to an acoustic wave that is propagated in a piezoelectric material, to produce amplification.

acoustoelectric amplifier *See* acoustic amplifier.

acoustoelectric effect The development of a direct-current voltage in a semiconductor or metal by an acoustic wave traveling parallel to the surface of the material. Also known as *electroacoustic effect*.

acoustooptical cell An electric-to-optical transducer in which an acoustic or ultrasonic electric input signal modulates or otherwise acts on a beam of light.

acquire 1. Of acquisition radars, the process of detecting the presence and location of a target in sufficient detail to permit identification. 2. Of tracking radars, the process of positioning a radar beam so that a target is in that beam to permit the effective employment of weapons. Also known as *target acquisition*.

actinodielectric Of a substance, exhibiting an increase in electrical conductivity when electromagnetic radiation is incident upon it.

actinoelectricity The electromotive force produced in a substance by electromagnetic radiation incident upon it.

action entries The lower right-hand portion of a decision table, indicating which of the various possible actions result from each of the various possible conditions.

action period The period of time during which data in a Williams tube storage device can be read or new data can be written into this storage.

action portion The lower portion of a decision table, comprising the action stub and action entries.

action stub The lower left-hand portion of a decision table, consisting of a single column listing the various possible actions (transformations to be done on data and materials).

activate 1. To make a cell or battery operative by addition of a liquid. 2. To treat the filament, cathode, or target of a vacuum tube to increase electron emission.

activated cathode A thermionic cathode consisting of a tungsten filament to which thorium has been added, and then brought to the surface, by a process such as heating in the absence of an electric field in order to increase thermionic emission.

activation 1. The process of adding liquid to a manufactured cell or battery to make it operative. 2. The process of treating the cathode or target of an electron tube to increase its emission. Also known as *sensitization*.

activation record A variable part of a program module, such as data and control information, that may vary with different instances of execution.

active area The area of a metallic rectifier that acts as the rectifying junction and conducts current in the forward direction.

6 active component

active component 1. In the phasor representation of quantities in an alternating-current circuit, the component of current, voltage, or apparent power which contributes power, namely, the active current, active voltage, or active power. Also known as power component. 2. *See* active element.

active computer When two or more computers are installed, the one that is on-line and processing data.

active current The component of an electric current in a branch of an alternating-current circuit that is in phase with the voltage. Also known as watt current.

active device A component, such as an electron tube or transistor, that is capable of amplifying the current or voltage in a circuit.

active electric network Electric network containing one or more sources of energy.

active electronic countermeasures The major subdivision of electronic countermeasures concerning electronic jamming and electronic deceptions.

active element Any generator of voltage or current in an impedance network. Also known as active component.

active filter A filter that uses an amplifier with conventional passive filter elements to provide a desired fixed or tunable pass or rejection characteristic.

active jamming *See* jamming.

active leg An electrical element within a transducer which changes its electrical characteristics as a function of the application of a stimulus.

active logic Logic that incorporates active components which provide such functions as level restoration, pulse shaping, pulse inversion, and power gain.

active master file A relatively active computer master file, as determined by usage data.

active master item A relatively active item in a computer master file, as determined by usage data.

active material 1. A fluorescent material used in screens for cathode-ray tubes. 2. An energy-storing material, such as lead oxide, used in the plates of a storage battery. 3. A material, such as the iron of a core or the copper of a winding, that is involved in energy conversion in a circuit. 4. The material of the cathode of an electron tube that emits electrons when heated.

active power The product of the voltage across a branch of an alternating-current circuit and the component of the electric current that is in phase with the voltage.

active region The region in which amplifying, rectifying, light emitting, or other dynamic action occurs in a semiconductor device.

active substrate A semiconductor or ferrite material in which active elements are formed; also a mechanical support for the other elements of a semiconductor device or integrated circuit.

active transducer A transducer whose output is dependent upon sources of power, apart from that supplied by any of the actuating signals, which power is controlled by one or more of these signals.

active voltage In an alternating-current circuit, the component of voltage which is in phase with the current.

activity The use or modification of information contained in a file.

activity level 1. The value assumed by a structural variable during the solution of a programming problem. 2. A measure of the number of times that use or modification is made of the information contained in a file.

activity ratio The ratio between used or modified records and the total number of records in a file.

actual argument The variable which replaces a dummy argument when a procedure or macroinstruction is called up.

actual decimal point The period appearing on a printed report as opposed to the virtual point defined only by the data structure within the computer.

actual instruction See effective instruction.

actual key A data item in COBOL computer language which can be used as an address.

actuating system An electric, hydraulic, or other system that supplies and transmits energy for the operation of other mechanisms or systems.

actuator A mechanism to activate process control equipment by use of pneumatic, hydraulic, or electronic signals; for example, a valve actuator for opening or closing a valve to control the rate of fluid flow.

acyclic feeding A method employed by alphanumeric readers in which the trailing edge or some other document characteristic is used to activate the feeding of the succeeding document.

acyclic machine See homopolar generator.

adapter A device which converts bits of information received serially into parallel bit form for use in the inquiry buffer unit.

adaptive control A control method in which one or more parameters are sensed and used to vary the feedback control signals in order to satisfy the performance criteria.

adaptive control function That level in the functional decomposition of a large-scale control system which updates parameters of the optimizing control function to achieve a best fit to current plant behavior, and updates parameters of the direct control function to achieve good dynamic response of the closed-loop system.

adaptive system A system that can change itself to meet new requirements.

adaptive system theory The branch of automata theory dealing with adaptive, or self-organizing, systems.

ADCON See address constant.

adconductor cathode A cathode in which adsorbed alkali metal atoms provide electron emission in a glow or arc discharge.

adder 1. A circuit in which two or more signals are combined to give an output-signal amplitude that is proportional to the sum of the input-signal amplitudes. Also known as adder circuit. 2. A computer device that can form the sum of two or more numbers or quantities.

adder circuit See adder.

adding circuit A circuit that performs the mathematical operation of addition.

adding machine A device which performs the arithmetical operation of addition and subtraction.

addition item An item which is to be filed in its proper place in a computer.

addition record A new record inserted into an updated master file.

addition table The part of memory that holds the table of numbers used in addition in a computer employing table look-up techniques to carry out this operation.

address The number or name that uniquely identifies a register, memory location, or storage device in a computer.

address computation The modification by a computer of an address within an instruction, or of an instruction based on results obtained so far. Also known as address modification.

address constant A value, or its expression, used in the calculation of storage addresses from relative addresses for computers. Abbreviated ADCON. Also known as base address; presumptive address; reference address.

address conversion The use of an assembly program to translate symbolic or relative computer addresses.

address counter A counter which increments an initial memory address as a block of data is being transferred into the memory locations indicated by the counter.

address field *The portion of a computer program instruction which specifies where a particular piece of information is located in the computer memory.*

address format A description of the number of addresses included in a computer instruction.

address-free program A computer program in which all addresses are represented as displacements from the expected contents of a base register.

address generation An addressing technique which facilitates addressing large storages and implementing dynamic program relocation; the effective main storage address is obtained by adding together the contents of the base register of the index register and of the displacement field.

addressing mode The specific technique by means of which a memory reference instruction will be spelled out if the computer word is too small to contain the memory address.

addressing system A labeling technique used to identify storage locations within a computer system.

address interleaving The assignment of consecutive addresses to physically separate modules of a computer memory, making possible the very-high-speed access of a sequence of contiguously addressed words, since all modules operate nearly simultaneously.

addressless instruction format *See* zero address instruction format.

address modification *See* address computation.

address part That part of a computer instruction which contains the address of the operand, of the result, or of the next instruction.

address register A register wherein the address part of an instruction is stored by a computer.

address sort routine A debugging routine which scans all instructions of the program being checked for a given address.

address track A path on a magnetic tape, drum, or disk on which are recorded addresses used in the retrieval of data stored on other tracks.

address translation The assignment of actual locations in a computer memory to virtual addresses in a computer program.

add-subtract time The time required to perform an addition or subtraction, exclusive of the time required to obtain the quantities from storage and put the sum or difference back into storage.

add time The time required by a computer to perform an addition, not including the time needed to obtain the addends from storage and put the sum back into storage.

add-to-memory technique In direct-memory-access systems, a technique which adds a data word to a memory location; permits linear operations such as data averaging on process data.

ADF See automatic direction finder.

A display A radar oscilloscope display in cartesian coordinates; the targets appear as vertical deflection lines; their Y coordinates are proportional to signal intensity; their X coordinates are proportional to distance to targets.

adjacency A condition in character recognition in which two consecutive graphic characters are separated by less than a specified distance.

adjacent-channel selectivity The ability of a radio receiver to respond to the desired signal and to reject signals in adjacent frequency channels.

adjustable resistor A resistor having one or more sliding contacts whose position may be changed.

adjusted decibel A unit used to show the relationship between the interfering effect of a noise frequency, or band of noise frequencies, and a reference noise power level of -85 dBm. Abbreviated dBa. Also known as decibel adjusted.

Administrative Terminal System A system developed by the International Business Machine Corporation to enable the handling by computer of texts that would otherwise require copying by a typist. Abbreviated ATS.

admittance A measure of how readily alternating current will flow in a circuit; the reciprocal of impedance, it is expressed in mhos.

admittance matrix A matrix Y whose elements are the mutual admittances between the various meshes of an electrical network; it satisfies the matrix equation $I = YV$, where I and V are column vectors whose elements are the currents and voltages in the meshes.

ADPE See automatic data-processing equipment.

advanced signal-processing system A portable data-processing system for military use; its complete configuration may consist of the analyzer unit, a postprocessing unit (for data-processing and control tasks), and an advanced signal-processing display unit. Also known as Proteus.

advance feed tape Computer tape punched so that the leading edges of its feed holes will line up with the leading edges of the data holes in the tape usage device.

aerial See antenna.

aerospace electronics The field of electronics as applied to aircraft and spacecraft.

aF See abfarad.

AFC *See* automatic frequency control.

a format A nonexecutable statement in FORTRAN which permits alphanumeric characters to be transmitted in a manner similar to numeric data.

AGC *See* automatic gain control.

agenda 1. The sequence of control statements required to carry out the solution of a computer problem. 2. A collection of programs used for manipulating a matrix in the solution of a problem in linear programming.

agendum call card A punch card that contains one item in an agenda for manipulation of a matrix in the solution of a linear programming problem.

aggressive device A unit of a computer that can initiate a request for communication with another device.

aging Allowing a permanent magnet, capacitor, meter, or other device to remain in storage for a period of time, sometimes with a voltage applied, until the characteristics of the device become essentially constant.

aH *See* abhenry.

A indicator *See* A scope.

air capacitor A capacitor having only air as the dielectric material between its plates. Also known as air condenser.

air cell A cell in which depolarization at the positive electrode is accomplished chemically by reduction of the oxygen in the air.

air condenser *See* air capacitor.

air-core coil An inductor without a magnetic core.

aircraft antenna An airborne device used to detect or radiate electromagnetic waves.

air gap 1. A gap or an equivalent filler of nonmagnetic material across the core of a choke, transformer, or other magnetic device. 2. A spark gap consisting of two electrodes separated by air.

airwave A radio wave used in radio and television broadcasting.

alarm signal The international radiotelegraph alarm signal transmitted to actuate automatic devices that sound an alarm indicating that a distress message is about to be broadcast.

Alaska Integrated Communications Exchange A network of radio stations, generally using scatter-propagation equipment, that links early-warning radar stations. Also known as Alice; White Alice.

algebraic manipulation language A programming language used in the solution of analytic problems by symbolic computation.

ALGOL An algorithmic and procedure-oriented computer language used principally in the programming of scientific problems.

algorithmic language A language in which a procedure or scheme of calculations can be expressed accurately.

algorithm translation A step-by-step computerized method of translating one programming language into another programming language.

alias An alternative entry point in a computer subroutine at which its execution may begin, if so instructed by another routine.