EXHIBIT C

MODERN DICTIONARY of ELECTRONICS

SEVENTH EDITION

REVISED AND UPDATED

Rudolf F. Graf

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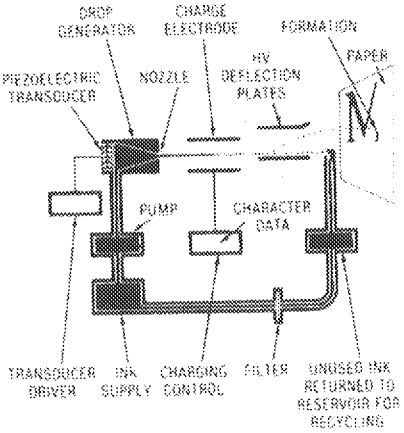
ink-jet printer — A nonimpact printer that forms letters and numbers by electrostatically aiming a jet of ink onto the paper.



Ink-jet printer.

ink-jet printing — A nonimpact printing technique that utilizes droplets of ink to form copy images. As the print head moves across the surface of the copy paper, it shoots a stream of tiny, electrostatically charged ink drops at the page, placing them precisely to form individual print characters.

ink-mist recording — Also called ink-vapor recording. In facsimile, electromechanical recording in which particles of an ink mist are deposited directly onto the record sheet.

ink recorder — The ink-filled pen or capillary tube that produces a graphic record.

ink recording — A type of mechanical facsimile recording in which an inked helix marks the record sheet.

ink-vapor recording — *See* ink-mist recording.

inleads — Those portions of the electrodes of a device that pass through an envelope or housing.

in-line heads — *See* stacked heads.

in-line procedures — 1. In COBOL, the procedural instructions that are part of the main sequential and controlling flow of the program. 2. Short functions whose code is inserted by the compiler at the point of call, thereby avoiding the overhead of a normal function call.

in-line processing — The processing of data in random sequence not subject to preliminary sorting or editing.

in-line subroutine — A subroutine that is inserted directly into the linear operational sequence. Such a subroutine must be recopied at each point in a routine where it is needed.

in-line tuning — The method of tuning the intermediate-frequency strip of a superheterodyne receiver in which all the intermediate-frequency amplifier stages are made resonant to the same frequency.

inorganic electrolyte — A solution that conducts electricity due to the presence of ions of substances not of organic origin.

in phase — Two waves of the same frequency that pass through their maximum and minimum values of like polarity at the same instant are said to be in phase.

in-phase portion of the chrominance signal — subcarrier modulated by the I signal. This portion of the chrominance signal may lead or lag the quadrature portion by 90 electrical degrees.

input — 1. The current, voltage, power or other driving force applied to a circuit or device. 2. The terminals or other places where current, voltage, power, or driving force may be applied to a circuit or device. 3. Data to be processed. 4. The process of transferring data from an external computer storage to an internal storage. 5. The terminals, jack, or receptacle provided for the introduction of an electrical signal or electric power into a device or system.

input admittance — 1. The reciprocal of the input impedance. 2. The admittance between the input terminals with the outputs shorted together.

input area — In a computer, the area of internal storage into which data from external storage is transferred.

input bias current — 1. The current that must be supplied to each input of an IC operational amplifier to assure proper biasing of the differential-input-stage transistors. In specification sheets, this term refers to the average of the two input bias currents. 2. One-half the sum of the separate currents entering the two input terminals of a balanced amplifier. 3. The average of the two input currents of an operational amplifier.

input block — In a computer, a section of the internal storage reserved for receiving and processing input data.

input capacitance — 1. The capacitance at the input terminals of a device. 2. The capacitance between gate and source terminals of a field-effect transistor at specified bias and frequency conditions, with the drain ac short-circuited to the source.

input channel — A channel through which a state is impressed on a device or logic element.

input common-mode range — The maximum input that can be applied to either input of an operational amplifier without causing damage or abnormal operation.

input common-mode rejection ratio — 1. The ratio of the change in input voltage to the corresponding change in output voltage, divided by the open-loop voltage gain. 2. The ratio of the full differential voltage gain to the common-mode voltage gain.

input common-mode voltage range — The range of voltages on the input terminals of an operational amplifier for which the amplifier is operational. Note that the specifications are not guaranteed over the full common-mode voltage range unless specifically stated.

input device — 1. The device or set of devices through which data is brought into another device. 2. A device such as a card reader or terminal keyboard that converts data from the form in which it has been received into electronic signals that can be interpreted by the computer.

input equipment — The equipment that introduces information into a computer.

input error voltage — The error voltage appearing across the input terminals of an operational amplifier when a feedback loop is applied around the amplifier.

input extender — A high-speed diode array used in a logic circuit when increased fan-in capability is required.

input formatting — The technique a system uses to put all entered data into a standard (or intelligible) format.

input gap — Also called buncher gap. In a microwave tube, the gap where the initial velocity modulation of the electron stream occurs.

input impedance — 1. The impedance a transducer presents to a source. 2. The effective impedance seen looking into the input terminals of an amplifier; circuit

than that which normally characterizes laser operation. On restoration of the *Q* to its normal high value, a high-power, short-duration pulse of coherent radiation (called a giant pulse) is emitted. Used most often in conjunction with pulsed pump radiation.

quad — 1. A structural unit employed in cables. A quad consists of four separately insulated conductors twisted together. These conductors may take the form of two twisted pairs. 2. A combination of four elements, either electronic components or complete circuits, in series-parallel or parallel-series arrangement. 3. A (series-parallel) combination of four transistors. 4. *See* quadraphonic.

quadded cable — A cable in which some or all of the conductors are in the form of quads.

quadding — Connecting transistors in a series-parallel configuration to achieve greater reliability.

Quad-8 — *See* Q-8.

quad latch — A group of four flip-flops, each of which has the capability of storing a true or false logic level, and all of which normally are enabled by a single control line. When the flip-flops are all enabled new information may be stored in each of them.

quadradisc — Another name for CD-4 disc.

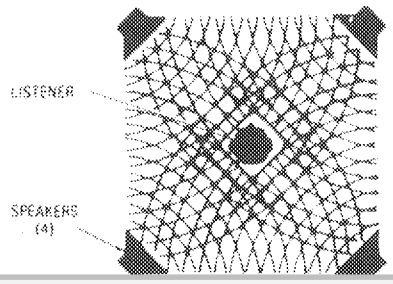
quadrant — 1. A sector, arc, or angle of 90°. 2. An instrument for measuring or setting vertical angles.

quadrantal error — The error in magnetic-compass readings by the magnetic field of the steel hull of a ship, or by metal structures near the loop antenna of radio direction finders aboard a vessel or aircraft.

quadrant electrometer — An electrometer for measuring voltages and charges by means of electrostatic forces. A metal plate or needle is suspended horizontally inside a vertical metal cylinder that is divided into four insulated parts, each connected electrically to the one opposite it. The two parts of quadrants are connected to the two terminals between which the potential difference is to be measured. The resultant electrostatic forces displace the suspended indicator a certain amount, depending on the voltage.

quadraphonic — Also spelled quadriphonic, quadrasonic; sometimes contracted to quad. A term used to describe four-channel sound systems and equipment. Sounds recorded and reproduced from four different directions to produce a field of sounds coming from an apparent 360° around the listener. Generally, any system of sound reproduction using more than the two usual stereo signals to recreate an impression of sounds coming from the rear of the listener as well as from the front.

quadraphony — A scheme of extended stereo whereby ambient and dimensional information is fed directly or via a matrix to a set of four speaker systems suitably oriented in the listening room. Various modulation or matrix systems are sometimes used so that four channels can be obtained by using some two-channel (stereo) equipment. The signals are then decoded so that four channels of sound can be reproduced through four speakers.



quadrasonic — *See* quadraphonic.

quadratic programming — In operations research, a particular case of nonlinear programming in which the function to be maximized or minimized and the constraints are quadratic functions of the controllable variables.

quadrature — The state or condition of two related periodic functions or two related points separated by a quarter of a cycle, or 90 electrical degrees.

quadrature amplifier — A stage used to supply two signals of the same frequency but with phase angles that differ by 90 electrical degrees.

quadrature amplitude modulation — *See* QAM.

quadrature carrier — *See* Q-phase.

quadrature component — 1. The reactive current or voltage component due to inductive or capacitive reactance in a circuit. 2. A vector representing an alternating quantity that is in quadrature (at 90°) with some reference vector.

quadrature modulation — The modulation of two carrier components 90° apart in phase by separate modulating functions.

quadrature phase detector — A phase detector operated in quadrature (90° out of phase) with the loop detector.

quadrature-phase subcarrier signal — Abbreviated QCW signal. That portion of the chrominance signal that leads or lags the in-phase portion by 90°.

quadrature portion — In the chrominance signal, the portion with the same or opposite phase from that of the subcarrier modulated by the Q signal. This portion of the chrominance signal may lead or lag the in-phase portion by 90 electrical degrees.

quadrature sensitivity — Also called side sensitivity, lateral sensitivity, or crosstalk sensitivity. The sensitivity of a transducer to motion normal to the principal axis. Commonly expressed in percent of the sensitivity in the principal axis.

quadriphonic — *See* quadraphonic.

quadripole network — *See* two-terminal-pair network.

quadruple diversity — The operation of combining four identical signals received over diverse paths to obtain an improvement of up to 6 dB in signal-to-noise ratio.

quadruple-diversity system — A receiving system in which space-diversity and frequency-diversity techniques are employed simultaneously.

quadruple play — Magnetic recording tape that is thinner than standard-play tape and consequently makes possible recordings four times longer than the standard-play tape.

quadruplex circuit — A telegraph circuit designed for carrying two messages in each direction simultaneously.

quadrupole — A combination of two dipoles that produces a force varying in inverse proportion to the fourth power of the distance from the generating charge.

quadrupole network — *See* two-terminal-pair network.

qualification — The entire procedure by which electronic parts are examined and tested to obtain and maintain approval at specified failure rate levels, and then identified on the qualified products lists.