IEEE Standard Dictionary of Electrical and Electronics Terms

Second Edition

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Frank Jay
Editor in Chief

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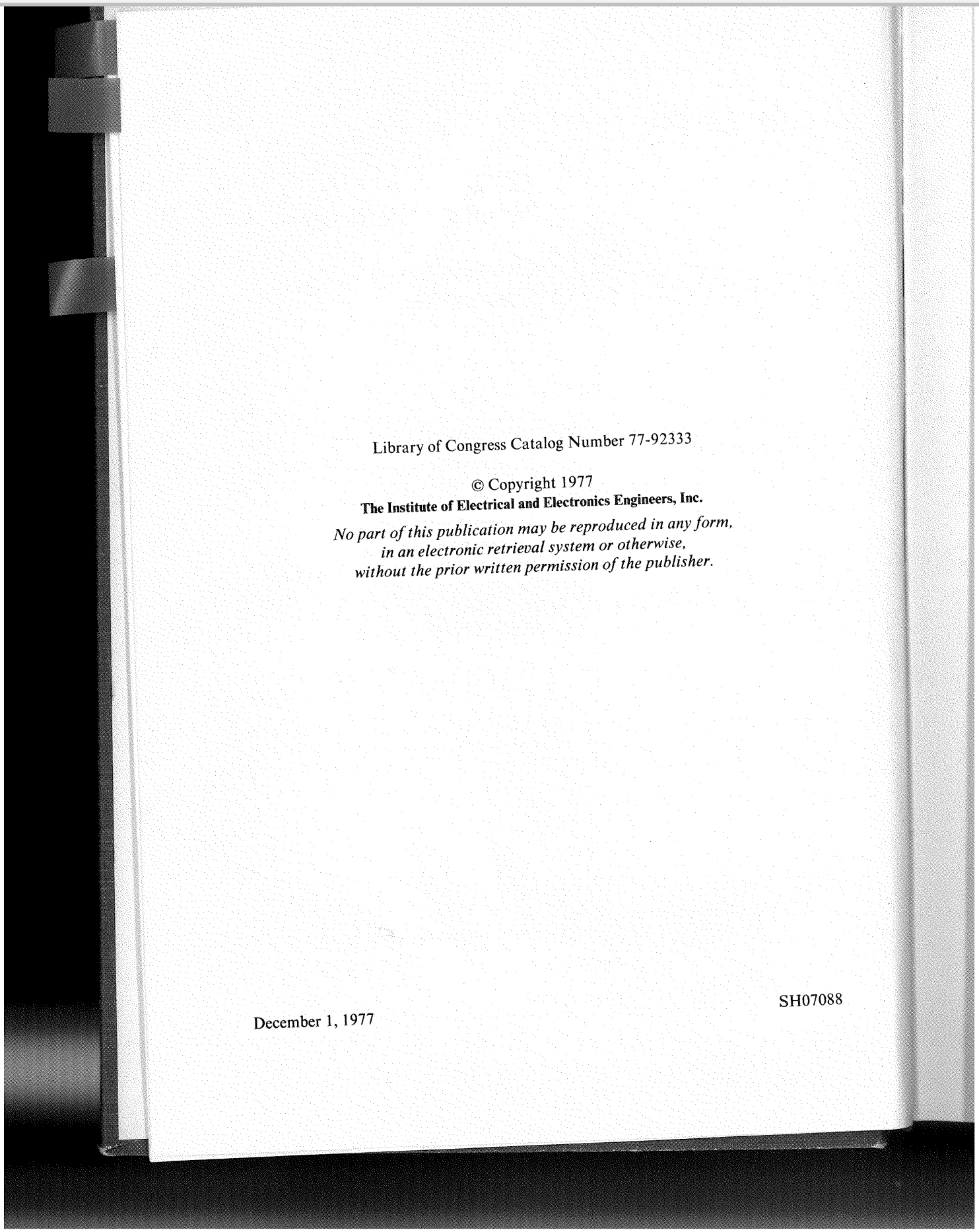

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both upper and lower limit frequencies are specified rather than the difference between them. When only one number appears, it is taken as the upper limit. *Notes:* (A) The reference frequency shall be at least 20 times greater for the lower bandwidth limit and at least 20 times less for the upper bandwidth limit than the limit frequency. The upper and lower reference frequencies are not required to be the same. In cases where exceptions must be made, they shall be noted. (B) This definition assumes the amplitude response to be essentially free of departures from a smooth roll-off characteristic. (C) If the lower bandwidth limit extends to zero frequency, the response at zero frequency shall be equal to the response at the reference frequency, not −3 decibels from it. 185

(11) (dispersive and nondispersive delay lines). A specified frequency range over which the amplitude response does not vary more than a defined amount. *Note:* Typically amplitude range is 1 dB bandwidth, 3 dB bandwidth. 81

(12) (analog computer). (A) Of a signal, the difference between the limiting frequencies encountered in the signal. (B) Of a device, the range of frequencies within which performance in respect to some characteristic falls within specific limits. 9

bandwidth, effective (bandpass filter in a signal transmission system). The width of an assumed rectangular bandpass filter having the same transfer ratio at a reference frequency and passing the same mean square of a hypothetical current and voltage having even distribution of energy over all frequencies. *Note:* For a nonlinear system, the bandwidth at a specified input level. *See also:* **network analysis; signal.** 111, 188

bandwidth, root-mean-square. The root mean squared (rms) deviation of the power spectrum of the received signal relative to zero frequency or the spectral center, in units of radians per second or hertz. This bandwidth, β, may be defined as

$$\beta^2 = \frac{\int_{-\infty}^{\infty} [2\pi(f - f_0)]^2 \, |S(f)|^2 \, df}{\int_{-\infty}^{\infty} |S(f)|^2 \, df}$$

where S(f) is the Fourier transform of the signal $s(t - \tau_0)$ with true time delay τ_0 and f_0 is the center frequency of the spectrum. *Note:* β^2 is the normalized second moment of the spectrum $|S(f)|^2$ about the mean. *See also:* **bandwidth.**

bank. An aggregation of similar devices (for example, transformers, lamps, etcetera) connected together and used in cooperation. *Note:* In automatic switching, a bank is an assemblage of fixed contacts over which one or more wipers or brushes move in order to establish electric connections. *See:* **relay level.** 328

bank-and-wiper switch (telephone switching system). A switch in which an electromagnetic ratchet or other mechanisms are used, first, to move the wipers to a desired group of terminals, and second, to move the wipers over the terminals of this group to the desired bank contacts. 328

banked winding. *See:* **bank winding.**

bank winding (banked winding). A compact multilayer form of coil winding, for the purpose of reducing distributed capacitance, in which single turns are wound successively in each of two or more layers, the entire winding proceeding from one end of the coil to the other, without return. 329

bar (lights). A group of three or more aeronautical ground lights placed in a line transverse to the axis, or extended axis, of the runway. 167

bare conductor. A conductor not covered with insulating material. 64

bare (exposed) lamp. A light source with no shielding. *See also:* **light.** 167

barette. A short bar in which the lights are closely spaced so that from a distance they appear to be a linear light. *Note:* Barettes are usually less than 15 feet in length. *See:* **bar (lights).** 167

bar generator (television). A generator of pulses that are uniformly spaced in time and are synchronized to produce a stationary bar pattern on a television screen. *See also:* **television.** 339

Barkhausen-Kurz oscillator. An oscillator of the retarding-field type in which the frequency of oscillation depends solely upon the electron transit-time within the tube. *See also:* **oscillatory circuit.** 111

Barkhausen tube. *See:* **positive-grid oscillator tube.**

bar pattern (television). A pattern of repeating lines or bars on a television screen. When such a pattern is produced by pulses that are equally separated in time, the spacing between the bars on the television screen can be used to measure the linearity of the horizontal or vertical scanning systems. *See also:* **television.** 328

barrel plating. Mechanical plating in which the cathodes are kept loosely in a container that rotates. *See also:* **electroplating.** 328

barretter (waveguide components). A form of bolometer element having a positive temperature coefficient of resistivity which typically employs a power-absorbing wire or thin metal film. 166

barrier (1). A partition for the insulation of isolation of electric circuits or electric arcs. 27, 103, 202

(2). (in a semiconductor) (obsolete). *See:* **depletion layer.**

(3) (nuclear power generating stations) (class 1E systems and equipment). A device or structure interposed between Class 1E equipment or circuits and a potential source of damage to limit damage to Class 1E systems to an acceptable level. 31, 131

barrier grid (charge-storage tubes). A grid, close to or in contact with a storage surface, which grid establishes an equilibrium voltage for secondary-emission charging and serves to minimize redistribution. *See also:* **charge-storage tube.** 174, 190

barrier wiring techniques (coupling in control systems). Those wiring techniques which obstruct electric or magnetic fields, excluding or partially excluding the fields from a given circuit. Barrier techniques are often effective against electromagnetic radiation also. In general, these techniques change the coupling coefficients between wires connected to a noise source and the signal circuit. Example: placement of signal lines within steel conduit to isolate them from an existing magnetic field. *See also:* **compen-**