

~~1088~~

# DICTIONARY of ELECTRONICS and NUCLEONICS

including

108 pages of appendices of relevant physical data

L E C HUGHES  
R W B STEPHENS  
L D BROWN

DICTIONARY OF  
ELECTRONICS  
AND  
NUCLEONICS

W & R CHAMBERS LTD  
11 THISTLE STREET EDINBURGH  
6 DEAN STREET LONDON

## PREFACE

Electronics and nucleonics are two of the most rapidly expanding fields of technology and the aim of this work is to give adequate coverage to both subjects within a single technical dictionary of reasonable size. The present volume was the inspiration of the late Dr L. E. C. Hughes, whose untimely death left his co-editors the formidable task of maintaining the high standard of his writing. Although we hope to have achieved this goal, there must inevitably be errors and omissions in any work covering such a wide and continuously developing field. In the words of Samuel Johnson, 'Every other author may aspire to praise, the lexicographer can only hope to escape reproach'. Suggestions from readers for improvements or additional material will always be appreciated.

The objective of the compilers has been to provide the most concise entry possible, consistent with conveying a complete and unambiguous meaning, and exact mathematical statements have been included only when the quantitative aspect of the reference is of fundamental importance. Entries are in word by word alphabetical order (single letters, as in **A-amplifier**, ranking as words), and there is an extensive system of cross-referencing, particularly under the basic electronic terms, e.g., **antenna**, **tube**. A comprehensive list of abbreviations, including those used in the main text and in electronics and associated fields generally, appears at the beginning of the book. During the later stages of production, some new terms, particularly in the computing field, together with a few older but less important definitions, were incorporated into a supplement to be found at the end of the book. The Appendices provide fuller statements of some of the fundamental theories of the increasingly complex fields of technology, particularly atomic and nuclear physics, as well as various useful and relevant tables of data.

Our thanks are due to the British Standards Institution, whose notation has been followed whenever possible, for use of their invaluable glossaries, and to other organizations noted in the Appendices, for permission to reproduce copyright material. Particular thanks are due to Mr J. H. Jupe and to the editor of *Industrial Electronics* for permission to reproduce material from the 'Trons Dictionary' which

originally appeared in *British Communications and Electronics* (March 1962), and to Dr J. de Klerk who computed the Decibel Tables. The authors are deeply indebted to Mr Collocott, Mr Thorne and Miss Lynas for the care and attention they have given to the preparation of this volume for the press.

RWBS  
LDB

### PUBLISHER'S NOTE

*Chambers Dictionary of Electronics and Nucleonics* was begun under the editorship of Dr L. E. C. Hughes, sometime editor of *Chambers Technical Dictionary*. On the death of Dr Hughes, the task of completion was taken over by Dr Raymond W. B. Stephens, Reader, Physics Department, Imperial College, London, and Mr L. Denis Brown, M.Sc., Senior Lecturer, Physics Department, West Ham College of Science and Technology. To both of these highly experienced workers in the fields of electronics and nucleonics is due the very considerable extension of the original plan, including the provision of the invaluable Appendices.

# CONTENTS

	PAGE
PREFACE . . . . .	v-vi
ABBREVIATIONS, ACRONYMS AND SYMBOLS . . . . .	1-18
THE DICTIONARY . . . . .	19-301
APPENDICES . . . . .	303-412
<b>SYMBOLS, PREFIXES AND EQUIVALENTS</b>	
Greek Alphabet and Usual Meanings in Electronics,	
Telecommunications and Nuclear Science . . . . .	304
Recommended Symbols for Electrical and Nuclear Quantities . . . . .	305
Common U.K. and U.S. Abbreviations for Electrical Units	
Verbal Interpretation of Letters	
Expressions in Radio Communication	
Electronic Term Equivalents	
Contact Nomenclature Equivalents . . . . .	306
International Morse Code	
Electronic Gates performing Logical Operations	
Electrical Supply Voltages and Frequencies in Various Countries . . . . .	307
SOME TERMS ENDING WITH 'TRON' . . . . .	308-12
<b>ELECTROMAGNETIC DATA</b>	
Electromagnetic Spectrum	
Frequency Band Designation in Radio Spectrum . . . . .	313
Allocation of HF Bands for Television and FM Radio in U.K.	
TV Line Standards in Various Countries	
Standard Frequency Transmissions in U.K. . . . .	314
Classification of Radio Transmissions	
Navigation Transmission . . . . .	315
British Waveguide Data . . . . .	316-18
SMITH CHART and its Applications . . . . .	319-20
<b>COMPONENT CLASSIFICATION AND CODING</b>	
Colour Code for Resistors . . . . .	321-22
Preferred Values of Resistances . . . . .	322
<b>PROPERTIES OF MATERIALS USED IN ELECTRONICS</b>	
Ferrite and Ferroelectric Materials . . . . .	323-25
Piezomagnetic Materials . . . . .	324-25
Piezoelectric Materials . . . . .	326
Quartz Crystal Cuts . . . . .	327
Insulating Materials . . . . .	328-29

	PAGE
Dielectric Heating . . . . .	330
Electrical Properties of Gases and Semiconductors . . . . .	331
Thermocouple Data . . . . .	332-33
Wire Data (SWG) . . . . .	334
<b>ELECTROACOUSTIC DATA</b>	
Acoustic Spectrum . . . . .	
Acoustic Absorption . . . . .	335
Optimum Reverberation Times . . . . .	
Acoustic Absorption Coefficients of some Common Materials . . . . .	336
Noise Measurement . . . . .	337
<b>SPACE VEHICLES AND SATELLITE COMMUNICATIONS</b>	
Space Research . . . . .	338
Directory of Space Vehicles . . . . .	338-40
Goonhilly Earth Stations . . . . .	340
<b>SUMMARY OF FUNDAMENTAL CONCEPTS OF ATOMIC AND NUCLEAR PHYSICS</b>	341-56
<b>IONIZING RADIATIONS</b>	
Radiation Hazards . . . . .	357-58
Quality Factors of Commonly-encountered Radiations . . . . .	358
Chart of Radiation Effects . . . . .	359
Biological and Chemical Effects of Radiation on Materials . . . . .	360
Cross-sections of Nuclear Fuels . . . . .	360-61
Calculations of Radiation Dose Rates and Shielding in Simple Cases . . . . .	362-64
Data on Commonly-encountered Artificial Radioisotopes . . . . .	365-73
<b>DECIBEL TABLES</b> . . . . .	374-99
<b>SYMBOLS, UNITS AND NOMENCLATURE IN PHYSICS</b>	
Physical Quantities . . . . .	400
Units . . . . .	400-01
Numbers . . . . .	401
Symbols for Chemical Elements, Nuclides and Particles . . . . .	402
Quantum States . . . . .	402-04
Nomenclature . . . . .	404
International Symbols for Units . . . . .	404-05
Physical Constants: Values in SI Units . . . . .	406
Physical Concepts in Rationalized MKS Units . . . . .	407-08
Standard Values and Equivalents . . . . .	409
<b>CONVERSION TABLES</b>	
Conversion Factors for British and Metric Mechanical Units . . . . .	410
Illumination and Luminance Conversion Table . . . . .	410-11
Conversion Factors required in Nuclear Reactor Physics . . . . .	411
Unit Conversion Table . . . . .	412
<b>SUPPLEMENT</b> . . . . .	413-44

## ABBREVIATIONS, ACRONYMS AND SYMBOLS

*N.B.*—In many cases usage is not standardized, and both lower case and capital letter versions are current, also versions with and without points or hyphens. Certain groups of initial letters which form words have become by common usage generally accepted as terms in their own right and may be found in the main text. In accordance with BSI recommendations, symbols for physical quantities are in italic type; others in roman type. For Greek symbols, see Appendices.

- A** *Ampere; absolute (temp.); amplitude; angström unit; constant in Richardson-Dushman equation; first Cauchy constant; Helmholtz free energy; refracting angle of prism.*
- A** Symbol for *atomic weight; magnetic vector potential.*
- Å** *Angström unit.*
- a** *Linear acceleration; year.*
- a** *First van der Waal constant.*
- A0** *Transmission with continuous carrier (unmodulated).*
- A1** *Transmission with interrupted CW carrier.*
- A2** *Transmission with carrier modulated by single frequency.*
- A3** *Transmission with carrier modulated by speech or music.*
- AA** *Artificial aerial.*
- AAFC** *Anti-aircraft fire control.*
- AAGL** *Anti-aircraft gun-laying by radar.*
- AAM** *Air-to-air missile.*
- ABC** *Automatic brightness (or bass) control.*
- ABCS** *American-British-Canadian Stores Catalogue.*
- ABK** *Airborne identification kit (transponder).*
- ABL** *Atlas basic language.*
- ABM** *Automatic batch mixing.*
- abs.** *Absolute.*
- AC** *Automatic (or analogue) computer.*
- a.c.** *Alternating current.*
- Ac** *Actinium.*
- ACA** *Adjacent channel attenuation.*
- ACC** *Automatic chrominance (or contrast) control.*
- ACE** *Automatic computing engine.*
- ACO** *Admiralty Compass Observatory, at Slough.*
- ACORN** *Automatic checkout and recording equipment.*
- ACR** *Approach (airfield) control radar.*
- ACRE** *Automatic checkout and readiness equipment.*
- ACSR** *Aluminium conductor steel reinforced.*
- AD** *Average deviation.*
- ADA** *Action data automation.*
- ADDAR** *Automatic digital data acquisition and recording.*
- ADF** *Automatic direction finder.*
- ADMA** *Automatic drafting machine.*
- ADP** *Ammonium dihydrogen phosphate.*
- a.d.p.** *Automatic data processing.*
- ADPC** *Automatic data-processing centre.*
- ADPS** *Automatic display and plotting systems.*
- A**
- AEA** *Atomic Energy Authority (U.K.).*
- AEC** *Atomic Energy Commission (U.S.).*
- AEE** *Atomic Energy Establishment.*
- AEI** *Associated Electrical Industries.*
- AERE** *Atomic Energy Research Establishment, at Harwell.*
- AEW** *Airborne early warning radar.*
- AF** *Audio frequency; accumulation factor.*
- AFC** *Automatic frequency control.*
- AFG** *Analogue function generator.*
- Ag** *Silver.*
- AGC** *Automatic gain control.*
- AGCA** *Automatic ground-controlled approach.*
- AGL** *Automatic gun-laying by radar.*
- AGR** *Advanced gas-cooled reactor.*
- AGS** *Automatic gain stabilization; alternating gradient synchrotron.*
- Ah** *Ampere-hour.*
- AI** *Airborne interception.*
- AID** *Aeronautical Inspection Directorate.*
- AIP** *American Institute of Physics.*
- AJ** *Anti-jamming.*
- Al** *Aluminium.*
- ALCOM** *Algebraic computer.*
- ALF** *Automatic letter facing; absorption limiting frequency.*
- ALPS** *Advanced linear programming system.*
- Alt.** *Altitude (angular in navigation).*
- ALU** *Arithmetic and logic unit.*
- AM** *Amplitude modulation; ante meridiem.*
- Am** *Americium.*
- AMC** *Automatic modulation control.*
- AMOS** *Automatic computer Ministry of Supply; automatic meteorological observation station.*
- amu** *Atomic mass unit.*
- ANACOM** *Analogue computer.*
- ANATRON** *Analogue translator.*
- ANL** *Anti- (or automatic) noise limiter.*
- AOS** *Add or subtract.*
- AP** *Air Publication of Air Ministry.*
- APC** *Automatic phase control.*
- APCHE** *Automatic programmed checkout equipment.*
- APEX** *All-purpose electronic X-ray computer (Birkbeck College).*
- API** *Air position indicator.*
- aprxly** *Approximately (computer language).*
- APT** *Automatically-programmed machine tool; automatic picture transmission.*
- APUHS** *Automatic programme unit, high speed.*
- APULS** *Automatic programme unit, low speed.*

- AQL** Acceptable quality level, used in electronic component manufacture.
- AR** Radio DF Beacon (Admiralty publications).
- Ar** Argon.
- ARC** Automatic relay calculator; automatic remote (or ratio) control.
- ARGUS** Automatic routine generating and updating system.
- ARL** Admiralty Research Laboratory, at Poole; acceptable reliability level.
- ARM** Automated route management.
- ARO** Automatic range only in radar range-finder.
- ARRL** American Radio Relay League.
- ARSE** Air route surveillance radar.
- ART** Automatic reporting telephone.
- ARTCC** Air route traffic control centre.
- ARU** Audio response unit; acoustic resistance unit.
- As** Arsenic.
- ASA** American Standards Association.
- ASB** Automatic airborne search radar.
- ASC** Automatic selectivity (or synchronized) control.
- ASCC** Automatic sequence-controlled calculator.
- ASCII** American Standard Code for Information Interchange.
- ASD** Automatic synchronized discriminator.
- ASE** Association for Science Education; Admiralty Signals Establishment.
- ASEE** Association of Supervising Electrical Engineers.
- ASIST** Advanced Scientific Instruments Symbolic Translator.
- ASLT** Advanced solid logic technology.
- ASM** Air-surface missile.
- ASMI** Aerodrome-surface movement indicator.
- ASN** Average sample number.
- ASO** Advanced Solar Observatory.
- ASP** Automatic servo plotter.
- ASPP1** Azimuth-stabilized plan position indicator.
- ASR** Air-sea rescue; automatic send-receive.
- ASRE** Admiralty Signal and Radar Establishment, at Portsdown.
- AST** Atlantic standard time.
- ASTM** American Society for Testing Materials.
- ASV** Automatic self-verification.
- AT** or **a.t.** Ampere-turn.
- A/T** Action time.
- At** Astatine; attenuation.
- at. no.** Atomic number.
- at. wt.** Atomic weight.
- ATC** Antenna (or aerial) tuning control (or capacitor); air-traffic control.
- atm** Atmosphere.
- ATR** Anti-transmit-receive.
- ATS** Administrative terminal system.
- Au** Gold.
- AVC** Automatic volume control.
- AVE** Automatic volume expansion.
- AVO** RTM for range of portable instruments measuring amperes, voltage, ohms, etc.
- AWG** American wire gauge.
- AWRE** Atomic Weapons Research Establishment.
- awu** Atomic weight unit.
- Az** Azimuth.
- B** Transmission with damped carrier (obsolete); boron.
- B** Brightness; symbol for magnetic flux density; magnetic induction; susceptance; second Cauchy constant; factor in Richardson-Dushman equation.
- b** Barn.
- b** Second van der Waal constant; bar.
- BA** British Association for the Advancement of Science.
- B/A** Beam approach.
- Ba** Barium.
- BABS** Blind approach beacon system.
- BAC** Binary asymmetric channel.
- BACE** Basic automatic checkout equipment.
- BAR** Buffer address register.
- BBC** British Broadcasting Corporation (originally Company).
- BCAC** British Conference on Automation and Computation.
- BCD/B** Binary-coded decimal/binary.
- BCD/Q** Binary-coded decimal/quaternary.
- BCFSK** Binary-code frequency-shift keying.
- BCI** ITU symbol for International Broadcasting Station.
- BCO** Binary-coded octal.
- BCRA** British Ceramic Research Association.
- BCRT** Bright cathode-ray tube.
- BCS** British Computer Society.
- BCW** Buffer control word.
- BDC** Binary decimal counter.
- BDI** Bearing deviation indicator.
- BDU** Basic display unit.
- Be** Beryllium.
- BEAMA** British Electrical and Allied Manufacturers Association.
- b.e.m.f.** Back electromotive force.
- BEPO** British Experimental Pile O (large air-cooled, natural-uranium, graphite-moderated reactor at Harwell).
- BFO** Beat-frequency oscillator.
- BH** Brinell hardness.
- BHP** Brake horsepower.
- Bi** Bismuth.
- BICEP** British Industrial Collaborative Exponential Programme—a joint team to study physics of gas-moderated, gas-cooled reactor system.
- BILE** Balanced inductor logical element.
- BIMAG** Bistable magnetic core.
- BIMCAM** British Industrial Measuring and Control Apparatus Manufacturers.
- BIOS** Biological investigation of space.
- BIPCO** Built-in place components.
- BIR** British Institute of Radiology.
- BIS** British Interplanetary Society.
- BIT** Built-in test.
- BIVAR** Bivariant function generator.
- BIX** Binary information exchange.
- BJCEB** British Joint Communications Electronics Board.
- Bk** Berkelium.
- BKS** British Kinematographic Society.



- BL** *Blanking.*  
**BLEU** *Blind-landing Experimental Unit.*  
**BLIP** *Background-limited infrared photo-conduction.*  
**BMEWS** *Ballistic missile early warning system.*  
**Bn** *Beacon (as in W/T Bn).*  
**BNES** *British Nuclear Energy Society.*  
**BOT** *Beginning of tape.*  
**BP** *Back projection; band pass.*  
**b.p.** *Boiling-point.*  
**BPI** *Bits per inch.*  
**BPL** *Diode transistor logic.*  
**BP<sub>n</sub>L** *Diode transistor micrologic.*  
**bps, b/s** *Bits per second.*  
**Br** *Bromine.*  
**BREMA** *British Radio Equipment Manufacturers Association.*  
**Brit.I.R.E.** *British Institute of Radio Engineers. Now IERE.*  
**BRPA** *British Radiological Protection Association.*  
**BRS** *Building research station; break request signal.*  
**BRVMA** *British Radio Valve Manufacturers Association.*  
**BS** *British Standard; binary subtract.*  
**BSDC** *British Space Development Company.*  
**BSF** *British Standard Fine gauge for screws.*  
**BSI** *British Standards Institution.*  
**BSRA** *British Sound Recording Association.*  
**BST** *British standard time.*  
**BSW** *British Standard Whitworth thread of screws.*  
**BTDL** *Basic-transient diode logic.*  
**BTG** *Beta thickness gauge.*  
**BTO** *Bombing through overcast.*  
**B.t.u.** *British thermal unit.*  
**BUIC** *Back-up interceptor control.*  
**BVA** *British Radio Valve Manufacturers Association.*  
**BW** *Bandwidth; black-and-white television.*  
**BWG** *Birmingham wire gauge.*  
**BWMS** *British Wireless Marine Service.*  
**BWO** *Backward-wave oscillator.*  
**BWR** *Boiling-water reactor.*  
**BX** *Insulated wires in sleeving.*
- C** *Coulomb; candle; candela; carbon.*  
**C** *Capacitance; heat capacity; Sutherland's constant.*  
**c** *Centi- (prefix for  $\times 10^{-2}$ ).*  
**c** *Symbol for velocity of light; concentration of solution; Planck radiation law constants.*  
**°C** *Degree Centigrade; originally and now internationally Celsius.*  
**C<sub>o</sub>** *Natural abundance.*  
**CA** *Cascade amplifier.*  
**Ca** *Calcium.*  
**CADF** *Commuted aerial direction-finding.*  
**CAFD** *Contact analogue flight display.*  
**CAI/O** *Computer analogue input/output.*  
**cal** *Calorie.*  
**CALDIC** *University of California electronic calculator.*  
**CAM** *Central address memory.*  
**C and C** *Command and control.*
- CANDU** *Canadian deuterium uranium reactor—a 200 MW nuclear power station near Lake Huron.*  
**CAP** *Civil Air Publication.*  
**Cap.** *Capacitor; capacitance.*  
**CAR** *Central apparatus room; channel address register.*  
**CART** *Computerized automatic rating technique.*  
**CAS** *Calibrated air speed.*  
**CAT** *Cooled-anode transmitting valve; College of Advanced Technology.*  
**CAV** *Cavity resonance.*  
**CAVALCADE** *Calibrating, amplitude-variation and level-correcting analogue-digital equipment.*  
**CAW** *Channel address word.*  
**CB** *Central battery system.*  
**CBI** *Compound Batch Identification.*  
**CBS** *Columbia Broadcasting System; central battery signalling system.*  
**CC** *Closed circuit (transmission).*  
**CCA** *Carrier-controlled approach.*  
**CCD** *Computer-controlled display.*  
**CCGCR** *Closed-cycle gas-cooled reactor.*  
**CCIR** *Comité Consultatif, International Radio.*  
**CCITT** *Consultative Committee, International Telegraph and Telephone.*  
**CCR** *Central control room.*  
**CCS** *Collective call sign.*  
**cct** *Circuit.*  
**ccw** *Counter-clockwise.*  
**CD** *Clock driver.*  
**Cd** *Cadmium.*  
**c.d.** *Current density.*  
**cd** *Candela.*  
**CDA** *Copper Development Association.*  
**CDC** *Code-directed character.*  
**CDCE** *Central data conversion equipment.*  
**CDF** *Combined distribution frame.*  
**CDH** *Command and data-handling.*  
**CDP** *Communication data processor.*  
**CdS** *Cadmium sulphide.*  
**CDT** *Control data terminal.*  
**CDU** *Coastal defence radar against U-boats; central display unit.*  
**CDX** *Control differential transmitter in U.S.*  
**Ce** *Cerium.*  
**CEGB** *Central Electricity Generating Board in U.K.*  
**CEI** *Communications electronics instructions.*  
**c.e.m.f.** *Counter electromotive force.*  
**CEP** *Circular error probability.*  
**CERL** *Central Electricity Research Laboratory in U.K.*  
**CERN** *Conseil Européen de Recherche Nucléaire, near Geneva.*  
**CET** *Central European Time.*  
**CETEX** *Committee for Extra-Terrestrial Exploration.*  
**Cf** *Californium; compare with.*  
**cfm/s** *Cubic feet per minute/second.*  
**c.g.** *Centre of gravity.*  
**cg** *Centigram.*  
**CGB** *Convert gray to binary.*  
**CGS** *Centimetre-gram(me)-second system of units.*

- CH** Choke coil.  
**CH(L)** Chain-home (low-flying).  
**CHU** Centigrade heat unit.  
**C/I** Carrier to interference ratio.  
**Cl** Curie.  
**CIC** Radar combat information centre.  
**CIE** Commission Internationale de l'Éclairage.  
**CIO** Central input/output multiplex.  
**CISPR** International Special Committee on Radio Interference of IEC.  
**CIT** Call-in time.  
**CK** Check.  
**CKO** Check operator.  
**CL** Centre line of plans, drawings; *central line*; conversion loss.  
**Cl** Chlorine.  
**cl** Centilitre.  
**CLD** Called line.  
**CLG** Calling line.  
**CLR** Computer language recorder.  
**CLT** Computer language translator; *communication line terminal*.  
**CM** Control mark; *computer module*.  
**C/M** Communications.  
**Cm** Curium.  
**cm** Centimetre; *circular mil*.  
**CMA** Cable Makers Association.  
**CMC** Contact making/breaking clock.  
**Cmd** Command Paper from HMSO.  
**CMF** Cross-modulation factor.  
**CML** Current mode logic.  
**cmp** Computational.  
**CMR** Continuous maximum rating of equipment; *common mode rejection*.  
**C/N** Carrier/noise.  
**CNL** Circuit net loss.  
**CNR** Carrier/noise power ratio.  
**CO** Coupled (or crystal) oscillator; *change over*.  
**Co** Cobalt.  
**CODIC** Computer-directed communications.  
**CODIPHASE** Coherent digital phased-array system.  
**CODIT** Computer direct to telegraph.  
**COGB** Certified official government business.  
**COHO** Coherent oscillator.  
**COL** Computer-oriented language.  
**COMET** Meteorological Office Computer.  
**COMM** Communications.  
**COMMZ** Communications zone.  
**COMSAT** Communication satellite (U.S.).  
**CONSORT** A 10 kW light-water moderated and cooled research reactor designed by Imperial College (London) and G.E.C.  
**COP** Computer optimization package.  
**COSMON** Component open/shut monitor.  
**COSPAR** Committee for Space Research of the International Council of Scientific Unions.  
**COZI** Communications zone indicator.  
**CP** Constant potential; *chemically pure*; *circular pitch*; *candle power*; *compare*; *cosmogenic*; *computer*.  
**CPA** Colour phase alternation.  
**CPC** Card process (or programmed) electronic calculator; *computer process control*.  
**CPDD** Command-post digital display.  
**CPE** Central programme and evaluator; *charged-particle equilibrium*.  
**CPIP** Computer pneumatic input panel.  
**CPM** Cards per minute; *critical path method*.  
**CPS** Cathode potential stabilization.  
**cps** Counts per second.  
**CPU** Central processing unit for computers.  
**Cr** Chromium.  
**CRAFT** Computerized relative allocation of facilities technique.  
**CRAM** Card random-access memory.  
**CRC** Carriage return contact.  
**CRETE** Common radio and electronic test equipment list of Naval test gear.  
**crit** Mass of fissionable material which is critical under given conditions.  
**CRMR** Continuous-reading meter relay.  
**CRO** Cathode-ray oscillograph.  
**CRS** Command retrieval system.  
**CRT** Cathode-ray tube.  
**CRTU** Combined receiving and transmitting unit.  
**CRYOSAR** Cryostatic switching-avalanche and recombination.  
**Cs** Caesium.  
**c/s** Cycles per second.  
**CSA** Canadian Standards Association.  
**CSIRO** Commonwealth Scientific and Industrial Research Organization.  
**CSO** Chained sequential operation.  
**CST** Central standard time (U.S.).  
**CT** Centre tap of a winding of an inductance, transformer, or battery; *control transformer in a servo system*.  
**CTB** Commonwealth Telecommunications Board.  
**CTCA** Channel and traffic control agency.  
**CT/N** Counter, *n* stages.  
**CTP** Central transfer point.  
**CTR** Controlled thermonuclear reaction.  
**CTU** Centigrade thermal unit.  
**CTV** Colour television.  
**CU** Close-up; crosstalk unit; *control unit*.  
**Cu** Copper; *cubic*.  
**CV** Continuously variable.  
**CVT** Constant-voltage transformer.  
**CVU** Constant-voltage unit.  
**CW** Continuous wave.  
**cw** Clockwise; *continuous-wound*.  
**CWO** Continuous-wave oscillator.  
**CWV** Continuous-wave video.  
**CX** Control transmitter.  
**CYBORG** Cybernetic organism.  
  
**D** Differential coefficient; *deuterium*; *doublet lines of ionized sodium vapour*.  
**D** Symbol for electric flux or displacement; *coefficient of fluid diffusion*.  
**d** Deci- (prefix for  $\times 10^{-1}$ ); *day*.  
**DAC** Data acquisition and control system; *digital arithmetic centre*.  
**DAGC** Delayed automatic gain control.  
**DAGMAR** Drift and ground-speed measuring airborne radar.  
**DAME** Data acquisition and monitoring equipment for computers.  
**DAP** Double-amplitude peak.

- DAPD** Directorate of Aircraft Production Development.
- DAS** Data acquisition system; digital attenuator system.
- DATACOM** Data communications.
- DAVC** Delayed automatic volume control.
- dB, db** Decibel.
- DBD** Double-base diode.
- dBk** Decibels with reference to one kilowatt.
- dBm** Decibels with reference to one milliwatt; decibel meter, level referred to 1 mW in 600 ohm.
- dBp** Decibels with reference to one picowatt.
- dBrap** Decibels above reference acoustic power.
- dBra** Decibels above reference noise.
- dBv** Decibels relative to 1 volt.
- dBW** Decibels relative to 1 watt.
- DC** Data channel.
- d.c.** Direct current.
- DCC** Double cotton-covered wire.
- CCU** Data communications control unit.
- DCR** Data conversion receiver.
- d.c.r.** Direct-current restorer.
- DCTL** Direct-coupled transistor logic.
- DCU** Decade counting unit.
- DCV** Direct-current voltage.
- DCX** Oak Ridge thermonuclear device—Direct-current Experiment (U.S.).
- DDA** Digital differential analyser.
- DDAS** Digital data acquisition system.
- DDC** Data distribution centre; digital data converter.
- DDCE** Digital data conversion equipment.
- DDG** Digital display generator.
- DDT** Digital data transmitter; dynamic debugging technique.
- Dec** Declination; decimal.
- decit** Decimal digit.
- DEF** Defence specification.
- Dem.** Demodulator.
- DERE** Dounreay Experimental Reactor Establishment, in N. Scotland.
- DES** Department of Education and Science; digital expansion system.
- DETAB** Decision tables.
- DEU** Data exchange unit.
- DEW** Distant early warning.
- DF** Direction-finding (or finder); degrees of freedom.
- DFG** Diode function generator.
- DH** Directly-heated.
- DHE** Data-handling equipment.
- DIAD** Drum information assembler and dispatcher.
- DIAMOD** Form of rectifier modulator.
- DIAN** Decca integrated air navigation system (Decca-Dectra-Doppler).
- DIDAS** Dynamic instrumentation data automobile system, for telemetry transmission and control from mobile plants.
- DIDO** Heavy-water (DDO) moderated reactor with a high flux and using enriched uranium fuel.
- DIGICOM** Digital communication system.
- DIMPLE** Deuterium moderated pile, low-energy reactor, using heavy water.
- DIN** Deutsche Industrien Normen (German Standard).
- DINA** Digital network analyser; direct-noise amplifier.
- dis.** Disconnect(ion).
- dist.** Distilled.
- DKT** Dipotassium tartrate piezo crystal.
- DL** Delay line; data link.
- dl** Decilitre.
- DMA** Direct memory address.
- DMC** Digital microcircuit.
- DME** Distance-measuring equipment.
- DMTR** Dounreay materials-testing reactor.
- dN** Declineper attenuation unit.
- DP** Data processing.
- dp** Deflection plate; double pole; dipole; dew point.
- DPC** Double paper-covered cable.
- DPDT** Double-pole double-throw switch.
- dpm/s** Disintegrations per minute/second.
- DR** Deduced (dead) reckoning in navigation; disk recorder.
- DRF** Dose reduction factor (for protective agent).
- DR3** Pluto-type reactor (Danish).
- DS** Data synchronization.
- DSB** Double sideband.
- DSC** Double silk-covered.
- DSIF** Deep space instrumentation facilities.
- DSIR** Department of Scientific and Industrial Research. (Obs., now SRC.)
- DSR** Discriminating selector repeater.
- DT** Data transmission.
- dt** Double-throw.
- DTI** Dial test indicator; distortion transmission impairment.
- DVM** Digital voltmeter.
- DVST** Direct vision storage tube.
- Dwg** Drawing.
- DWI** Differential wave impedance.
- DX** Distant radio communication.
- Dy** Dysprosium.
- dyn.** Dynamo; dynamometer; dyne.
- DYSEAC** Second National Bureau of Standards Eastern Automatic Computer.
- E** Symbol for electric force; electric field strength; illumination; electromotive force; single electrode potential; Young's modulus of elasticity.
- e** Symbol for base of natural logarithms (2.71828...).
- e** Symbol for charge of electron; permittivity.
- EAL** Electromagnetic amplifying lens.
- EASI** Electrical Accounting for the Security Industry.
- EAST** East Australian standard time.
- EAX** Electronic automatic exchange.
- EBR** Experimental breeder reactor.
- EBU** European Broadcasting Union in West Europe.
- EBWR** Experimental boiling-water reactor.
- ec** Electron-coupled.
- ECARS** Electronic Coordinatograph and Read-Out System.
- ECASS** Electronically-controlled automatic-switching system.
- ECC** Electrocardiometer.

- ECCM** *Electronic countermeasures.*  
**ECDS** *Electrochemical diffused-collector transistor.*  
**ECG** *Electrocardiogram (-graph).*  
**ECLO** *Emitter-coupled logic operator.*  
**eco** *U.S. for electron-coupled oscillator.*  
**ECX** *Electronically-controlled telephone exchange.*  
**ED** *Electrodynamic.*  
**EDA** *Electrical Development Association.*  
**EDGE** *Electronic data-gathering equipment.*  
**EDP** *Electronic data processing.*  
**EDPM** *Electronic data-processing machine.*  
**EDPS** *Electronic data-processing system.*  
**EDSAC** *Electronic {delayed-storage automatic computer.*  
**EDT** *Ethylenediamine tartrate piezo crystal; eastern daylight-saving time (EST+1 h).*  
**EDVAC** *Electronic discrete variable automatic computer.*  
**EEA** *Electronic Engineering Association.*  
**EEG** *Electroencephalograph (-gram); electro-nephalograph.*  
**EF** *Extra-fine thread.*  
**EFL** *Effective focal length.*  
**EGO** *Elliptically-orbiting Geophysical Observatory.*  
**EHF** *Extremely high frequency.*  
**EHP** *Effective horsepower.*  
**EHT** *Extra high tension.*  
**EIA** *Engineering Industries Association (U.S.).*  
**EKG** *Electrocardiogram (-graph).*  
**ELCO** *Electrolytic capacitor.*  
**ELDO** *European Launcher Development Organization.*  
**ELEM** *Element.*  
**ELF** *Extremely low frequency.*  
**ELS** *Electrostatic loudspeaker.*  
**ELT** *Electrometer.*  
**EM** *Electromagnetic.*  
**EMAR** *Experimental memory address register.*  
**EMCCC** *European Military Communications Coordinating Committee.*  
**e.m.f.** *Electromotive force.*  
**EMIAC** *Electrical and Musical Industries analogue computer.*  
**EMP** *Electronic multiplying punches.*  
**EMTA** *Electro Medical Trade Association.*  
**e.m.u.** *Electromagnetic unit.*  
**ENEA** *European Nuclear Energy Authority.*  
**ENI** *Equivalent noise input.*  
**ENIAC** *Electronic numeral integrator and calculator.*  
**ENSI** *Equivalent noise sideband input.*  
**EOS** *Electro-optical system.*  
**EOT** *End of tape.*  
**EP** *Electrically polarized; electropneumatic; extended-play; electroplate.*  
**EPI** *Elevation-position indicator.*  
**EPIC** *Electronic plotting equipment, especially developed at the Royal Observatory, Herstmonceux, for recording star transits.*  
**EPR** *Equivalent parallel resistance of a crystal; electron paramagnetic resonance.*  
**EPTA** *Electrophysiological Technologists Association.*  
**Er** *Erbium.*  
**ERA** *Electronic reading automaton, which reads and codes printed figures.*  
**ERMA** *Electronic recording machine accounting.*  
**ERP** *Effective or equivalent radiated power from antenna.*  
**ERTI** *Electron-ray tuning indicator, magic eye.*  
**Es** *Einsteinium.*  
**es** *Electrostatic.*  
**ESC** *Enamelled single-covered (wire).*  
**ESG** *Electronic sweep generator.*  
**ESR** *Equivalent series resistance of resonating crystal; effective signal radiated; electron spin resonance.*  
**ESRO** *European Space Research Organization.*  
**ESS** *Electronic switching system.*  
**EST** *Eastern standard time (U.S.).*  
**e.s.u.** *Electrostatic unit.*  
**e.s.v.** *Electrostatic voltmeter.*  
**ET** *Ephemeral time.*  
**ETA (or D)** *Estimated time of arrival or departure.*  
**ETSPL** *Equivalent threshold sound pressure level.*  
**Eu** *Europium.*  
**eV** *Electron-volt.*  
**EVATRON** *Eccentric variable-angle thermionic rheostat.*  
**EWO** *Electrical and Wireless Operators.*  
**EWK** *Early warning radar.*  
**ExAM** *Ex Air Ministry.*  
**Exp.** *Exponential.*  
**F** *Fahrenheit; farad; faraday; filament; fluorine; fuse.*  
**F** *Symbol for Helmholtz function; magnetomotive force.*  
**f** *Symbol for focal length/effective diameter of a lens.*  
**f** *Symbol for frequency; acceleration.*  
**f<sub>a</sub>** *Alpha cutoff frequency.*  
**f<sub>c</sub>** *Cutoff frequency.*  
**FA** *French Army valve.*  
**FAB** *ITU abb. for aeronautical broadcast station.*  
**FAC** *ITU abb. for airport control station.*  
**FACT** *Fully-automatic compiling technique.*  
**FAST** *Flexible algebraic scientific translator.*  
**FAT** *ITU abb. for flight test station.*  
**FAX** *ITU abb. for fixed aeronautical station.*  
**fax** *Facsimile in U.S.*  
**FB** *ITU abb. for base station.*  
**FBC** *Fully-buffered channel.*  
**FBI** *Federation of British Industries.*  
**FC** *Frequency changer or converter; fine control; front-connected; ITU abb. for coast station.*  
**f.c.** *Foot-candles.*  
**FCB** *ITU abb. for marine broadcasting station.*  
**FCC** *Federal Communications Commission (U.S.).*  
**FCS** *Fire control system radar.*  
**FCT** *Filament centre-tap.*  
**FD** *Frequency doubler.*  
**FDM** *Frequency division multiplex.*  
**FDS** *Fermi-Dirac-Sommerfeld.*

- Fe** Iron.  
**FEDAL** Failed element detector and locator in nuclear reactors.  
**FEP** Financial evaluation programme.  
**FET** Field-effect transistor.  
**F-F** Flip-flop.  
**FFF** Fission-fusion-fission bomb.  
**ffr** Full-frequency range recording.  
**ffss** Full-frequency stereophonic sound.  
**FIDO** Fog Investigation and Dispersal Organization.  
**FIFO** Floating input-floating output.  
**FL** Electric wave filter; ITU abb. for land station.  
**FLE** ITU abb. for land telemetering station.  
**FLF** Flip-flop.  
**FLH** ITU abb. for land hydrological and meteorological station.  
**FM** Frequency modulation; feedback mechanism; floor manager (of a studio).  
**Fm** Fermium.  
**FMI** Flow measurement and indication.  
**FNBR** Fast neutron breeder reactor.  
**FO** Fast operation of relay.  
**f.o.m.** Figure of merit.  
**FOPT** Fibre optic photo transfer.  
**FOT** Optimum working frequency (abb. from French).  
**FP** Flame-proof equipment;  
**f.p.** Freezing-point.  
**fph** Full power hours, of life for reactor fuel element.  
**f.p.m.** Feet per minute.  
**FPS** Foot-pound-second. System of legal units (Imperial) based on the foot, the pound (weight), and the second, as fundamental dimensions; used in ordinary commerce and mechanical engineering in U.K. and U.S.  
**f.p.s.** Feet (or frames) per second.  
**FR** Fast release of relay; field resistance.  
**Fr** Francium; French; frame.  
**FRED** Figure reading electronic device.  
**FS** Factor of safety; Federal Specification in U.S.; frame scan.  
**FSD** Full-scale deflection.  
**FSK** Frequency-shift keying.  
**FSM** Field-strength meter.  
**FSR** Feedback shift register.  
**FTB** Frequency time base.  
**FTC** Fast time constant.  
**FTM** Frequency time modulation.  
**FW** Full-wave rectifier.  
**FWHM** Full width at half maximum amplitude.  
**FWHP** Full width at half peak amplitude.  
**FX** ITU abb. for fixed hydrological and meteorological station.  
**Fx** ITU abb. for fixed station.  
**FXBIN** Decimal to fixed binary translation.  
**FXE** ITU abb. for fixed telemetering station.  
  
**G** Gauss; giga- (prefix for  $\times 10^9$ ); gilbert.  
**G** Symbol for conductance; transconductance in valves.  
**g** Gram(me).  
**g** Symbol for acceleration due to gravity at earth's surface.  
  
**gm** Symbol for transconductance or mutual conductance.  
**GA** General arrangement; go-ahead signal (or cue).  
**Ga** Gallium.  
**Galv.** Galvanic; galvanometer.  
**GAR** Guided aircraft rocket, an air-to-air missile, self-homing by heat or radar.  
**GB** Gain bandwidth; grid bias.  
**GC** Great Circle.  
**GCA** Ground-controlled approach.  
**GCI** Ground-controlled interception.  
**GCL** Ground-controlled landing.  
**Gc/s** Gigacycles per second, unit of frequency in microwaves, equal to  $10^9$  Hz.  
**GCT** Greenwich civil time.  
**GD** Ground detector.  
**Gd** Gadolinium.  
**Ge** Germanium.  
**gen.** Direct-current generator.  
**GG** Grounded grid valve.  
**G/G** Ground to ground.  
**GHA** Greenwich hour angle.  
**GHz** Gigahertz.  
**GL(T)** Gun-laying (turret) by radar.  
**GM** Geiger-Müller counter; Gill-Morell valve oscillator; gramophone motor.  
**Gm** Same as gm.  
**GMT** Greenwich mean time.  
**GMV** Guaranteed minimum value.  
**gnd** Ground (U.S.).  
**GOR** General operational requirement.  
**GPAC** General purpose analogue computer.  
**GPC** General purpose computer.  
**GPDC** General purpose digital computer.  
**GPI** Ground position indicator.  
**GPS** Groups of pulses per second.  
**GRF** Group repetition frequency.  
**GSG** Glass-silicone-glass laminate for electronic component packaging.  
**GST** Greenwich sidereal time.  
**GT** Glass tube; game theory.  
**GTS** Greenwich time signal in broadcasting and television.  
**GW** Guided weapon.  
**GZ** Ground-zero of nuclear weapon.  
  
**H** Heater (valves and tubes); henry (mutual inductance unit); hydrogen.  
**H** Symbol for magnetizing force; for magnetic field strength; for enthalpy; for Boltzmann's entropy constant.  
**h** Hour.  
**h** Symbol for Planck's constant.  
**h** Symbol for Dirac's constant.  
**HA** Hour angle (navigation); high angle (radar); half add.  
**HAC** Heavy-aggregate concrete, used for shielding.  
**H & D** Hurter and Driffield, who derived procedure for relating density to exposure.  
**H & N** Hum and noise.  
**HAWK** Homing all-the-way killer missile.  
**HAZEL** Homogeneous aqueous zero energy level reactor at Harwell.  
**HC** Handling capacity.  
**HD** Hydrographic Dept. Admiralty.  
**HDSS** High-density data system.

- HDM** *Harmonic distortion meter.*  
**HDO** *Hydrogen-deuterium-oxygen (chemical symbol for heavy water).*  
**He** *Helium.*  
**HEC** *Hollerith electronic computer.*  
**HECTOR** *Heated experimental carbon thermal oscillator reactor for test purposes at Winfrith Heath.*  
**HELEN** *Hydrogenous Experimental Liquid Experiment. A light-water moderated subcritical assembly at Winfrith used for extending uranium reactor calculations to plutonium-fuelled reactors.*  
**HEM** *Hybrid electromagnetic wave.*  
**HERALD** *Highly-enriched reactor, Aldermaston. A 5 MW light-water, moderated, cooled reactor using highly enriched fuel.*  
**HERO** *Hot experimental reactor of zero power, at Windscale, anticipating AGR.*  
**Het** *Supersonic heterodyne radio reception.*  
**Hex** *Uranium hexafluoride.*  
**HF** *High frequency.*  
**Hf** *Hafnium.*  
**HFRDF** *High-frequency repeater distribution frame.*  
**Hg** *Mercury.*  
**HHF** *Hyper-high-frequency.*  
**HICAPOM** *High-capacity communications.*  
**HIFAM** *High-fidelity amplitude modulation.*  
**HIFAR** *High-flux Australian reactor, at Sydney, N.S.W.*  
**HIG** *Hermetic integrating gyroscope.*  
**HIK** *High permittivity material.*  
**HILAC** *Heavy ion linear accelerator.*  
**HMF** *Hum modulation factor.*  
**HO** *Hydrographic Office (U.S.).*  
**Ho** *Holmium.*  
**HORACE** *H<sub>2</sub>O reactor Aldermaston critical experiment, a zero-energy reactor at AWRE used for testing fuel elements arrangement in the HERALD reactor.*  
**HP** *High-pass filter; horsepower.*  
**HPI** *Height-position indicator.*  
**HPRR** *High-performance research reactor (U.S.).*  
**HR** *High-range radar.*  
**HRE** *Homogeneous reactor experiment (U.S.).*  
**HRI** *Height range indicator.*  
**HRP** *Horizontal radiation pattern of a transmitting or receiving antenna.*  
**HS** *High-stability height given by sextant.*  
**HSAC** *High-speed analogue computer.*  
**HSDA** *High-speed data acquisition.*  
**HT(B)** *High-tension (battery).*  
**HTGCR** *High-temperature gas-cooled reactor, with ceramic fuel elements.*  
**HTO** *Hydrogen-tritium-oxygen (chemical symbol for tritiated water).*  
**HV** *High voltage; hard valve.*  
**HW** *Half-wave rectifier.*  
**Hx** *Hexode.*  
**HYCOTRAN** *Hybrid computer translator.*  
**HYPO** *High-power water boiler reactor, sodium thiosulphate.*  
**Hz** *Hertz.*  
  
**I** *Iodine; moment of inertia.*  
  
**I** *Symbol for luminous intensity; for electric current; for acoustic intensity; watts per sq. cm.; ionic strength.*  
**i** *Instantaneous current  $\sqrt{-1}$ .*  
**IAEA** *International Atomic Energy Agency.*  
**IAGC** *Instantaneous automatic gain control.*  
**I and C** *Installation and checkout.*  
**IAS** *Indicated air speed.*  
**IBM** *International Business Machines Ltd.*  
**IBU** *One-time International Broadcasting Union.*  
**IC** *Internal connection of valve; intervalve coupling; information content; in charge; integrated circuit.*  
**ICBM** *Intercontinental ballistic missile.*  
**ICCE** *Imperial College computing element.*  
**ICI** *One time International Commission on Illumination (now CIE); Imperial Chemical Industries.*  
**ICR** *Institute of Cancer Research.*  
**ICRP** *International Commission on Radiological Protection, which formulates maximum permissible doses of radiation.*  
**ICRU** *International Commission on Radiological Units and Measurements.*  
**ICSE** *Intermediate current stability experiment, once proposed as a development from zeta.*  
**ICT** *International Computers and Tabulators Ltd.*  
**ICW** *Interrupted continuous wave.*  
**ICWM** *International Commission for Weights and Measures.*  
**IDF** *Intermediate distribution frame for circuits.*  
**IDP** *Integrated data processing, that based on business management reorganization.*  
**IDS** *Integrated data store.*  
**IE** *Institution of Electronics.*  
**IEC** *International Electrotechnical Commission.*  
**IEE** *Institution of Electrical Engineers.*  
**IEETE** *Institution of Electrical and Electronics Technician Engineers.*  
**IEME** *Inspectorate of Electrical and Mechanical Equipment.*  
**IERE** *Institution of Electronic and Radio Engineers.*  
**IES** *Illuminating Engineering Society.*  
**IF** *Intermediate frequency, especially of a supersonic heterodyne receiver; information collector.*  
**IFF** *Identification, friend or foe.*  
**IFPP** *Irradiated fuel processing plant.*  
**IFR** *Instrument Flight Rules; internal function register.*  
**IFRB** *International Frequency Registration Board, which advises ITU on the best use of radio frequencies.*  
**IFRU** *Interference frequency rejection unit.*  
**IG** *Insulated gate.*  
**IGY** *International Geophysical Year.*  
**IH** *Indirectly-heated cathode or valve.*  
**ILLIAC** *University of Illinois automatic computer.*  
**ILS** *Instrument landing system.*  
**IMC** *Image motion compensation.*  
**IMO** *Interband magneto-optic effect.*  
**In** *Indium.*  
**INE** *Institute of Nuclear Engineers.*

- Inst.P.** Institute of Physics.  
**Int.** Internal; interior; international; integral.  
**Intercom.** Intercommunication, radio or telephone.  
**INTELSAT** International Satellite Communications Organization.  
**inv** Inverter.  
**I/O** Input/output.  
**Io** Ionium.  
**IOB** Input-output buffer.  
**IOC** Input-output controller.  
**IP** Imaginary part (of complex number).  
**IPA** Intermediate power amplifier.  
**IPC** Information processing centre; industrial process control.  
**IPD** Insertion phase delay.  
**IPE** Institution of Production Engineers.  
**IPM/S** Interruptions per minute/second.  
**IP(S)** Input primary (secondary) of transformer.  
**IQSY** International quiet solar year.  
**IR** India-rubber; information retrieval.  
**Ir** Iridium.  
**i.r.** Infrared.  
**IRASER** Infrared laser.  
**IRSU** International Radio Scientific Union.  
**IS** Internal shield; insulating sleeving.  
**ISB** Independent sideband of carrier.  
**ISO** International Standardization Organization.  
**ISR** Information storage and retrieval.  
**IST** Indian standard time.  
**IT** Input translator; item transfer.  
**ITA** Independent Television Authority (U.K.).  
**ITU** International Telecommunications Union, which governs international telephone, telegraph and radio services.  
**I(T)(V)** Inverted-TV antenna.  
**IUPAC or P** International Union of Pure and Applied Chemistry or Physics.  
**Iv** Inverter.
- J** Joule; Joule's equivalent; inner quantum number.  
**J** Symbol for current density.  
**j**  $\sqrt{-1}$  in electricity. Otherwise **i**.  
**JAN** Joint Army Navy (equipment designation).  
**JASON** A 10 kW light-water cooled, graphite-moderated research reactor.  
**JDC** Job description card.  
**JERC** Joint Electronic Research Committee of the Post Office and manufacturers.  
**JETEC** Joint Electron Tube Engineering Council (U.S.).  
**JIE** Junior Institution of Engineers.  
**J/S** Ratio in dB of total interference power to signal-carrier power at the receiver.  
**JST** Japanese standard time.
- K** Kilohm; Kerr constant; symbol for cathode (U.S.); potassium.  
**K25** Code name for Oak Ridge uranium separation plant.  
**K** Degree Kelvin on absolute temperature scale.  
**A\***
- k** Kilo- (prefix for  $\times 10^3$ ); kayser; dielectric constant.  
**k** Symbol for Boltzmann's constant; phase constant; thermal conductivity; multiplication factor for chain reaction; bulk modulus of elasticity.  
**kc** Kilocalorie; kilocycle/second (U.S.).  
**kCi** Kilocurie.  
**kc/s** Kilocycles per second.  
**KERMA** Kinetic energy released per unit mass.  
**kg** Kilogram(me).  
**kHz** Kiloherz.  
**k(ilo)var(h)** Kilovolt-ampere reactive (hour).  
**kM** Kilomega- (prefix for  $\times 10^6$ ).  
**km** Kilometre.  
**Kr** Krypton.  
**kV** Kilovolt.  
**kVA** Kilovolt-ampere.  
**kVp** Kilovolts, peak.  
**kW** Kilowatt.  
**kWh** Kilowatt-hour, unit of power (energy).  
**KY** Keying device.
- L** Symbol for filter reaction consisting of series and shunt arm; lambert; lumen.  
**L** Symbol for inductance; for brightness or luminance.  
**L<sub>mn</sub>** Mutual inductance.  
**l** Litre; azimuthal or orbital quantum number.  
**LA** Loop antenna; low angle (radar).  
**La** Lanthanum.  
**LAC** Load accumulator.  
**LACE** Luton analogue computing engine.  
**LADAR** Laser radar.  
**Lam.** Lamination for transformer.  
**LANAC** Laminar navigation anti-collision.  
**Laq.** Lacquer on wire.  
**LAT** Local apparent time.  
**Lat.** Latitude.  
**LB** Line buffer.  
**LC** Inductance-capacitance tuned circuit for oscillator; loading coil of circuit.  
**L/C** Inductance-capacitance ratio for tuned circuit.  
**LCAO** Linear combination of atomic orbitals.  
**LDDS** Low-density data system.  
**LDRI** Low data rate input.  
**LDX** Long-distance xerography.  
**LEP** Lowest effective power.  
**LET** Linear energy transfer.  
**LF** Low frequency.  
**LFC** Low-frequency choke.  
**LHA** Local hour angle.  
**Li** Lithium.  
**LIDAR** Laser infrared radar.  
**LIFT** Logically-integrated Fortran translator.  
**LIM** Limit(er) in frequency modulation.  
**LINAC** Linear accelerator.  
**LITR** Low-intensity test reactor (U.S.).  
**LL** Lower limit; lower level; loudness level.  
**LLR** Load limiting resistor.  
**lm** Lumen.  
**LMFR** Liquid-metal fuel reactor (U.S.).  
**LMS** Level measuring set, which determines transmission levels relative to zero reference level, 1 mW in 600  $\Omega$ .

- LMTD** *Logarithmic mean temperature difference.*
- ln** *Napierian or natural logarithm to base e.*
- LO** *Local oscillator; locked open relay.*
- Log** *Common logarithm to base 10.*
- Log dec** *Logarithmic decrement of decay of oscillation.*
- LOGANDS** *Logical commands.*
- LOGRAM** *Logical programme.*
- LOP** *Line of position.*
- LOPO** *Low-power water boiler reactor (U.S.).*
- LOS** *Line of sight for radio or radar transmission; loss of signal.*
- LP** *Long-playing record; low-pass filter; linear programming.*
- LPF** *Low-pass wave filter.*
- LpW** *Lumens per watt of a lamp.*
- LR** *Level recorder.*
- L+R, L-R** *Respectively the 'sum' and 'difference' elements in a stereo sum and difference signal complex.*
- LRD** *Long-range data.*
- LS** *Loudspeaker; line scan.*
- LSB** *Least significant bit.*
- LST** *Local sidereal (or standard) time.*
- Lt** *Limit (of summation or series).*
- LT(B)** *Low-tension (battery).*
- Lu** *Lutecium.*
- LUHF** *Lowest useful high-frequency radio wave.*
- LV** *Low voltage.*
- LVCD** *Least voltage coincidence detection.*
- LW** *Long wave.*
- Lw** *Lawrencium.*
- lx** *Lux, unit of illumination.*
- M** *Mega- (prefix for  $\times 10^6$ ).*
- M** *Symbol for intensity of magnetization; magnetic moment; magnetic polarization; molecular weight; mutual inductance; m.m.f.; Maxwell; Mach number.*
- m** *Milli- (prefix for  $\times 10^{-3}$ ); metre; minute.*
- m** *Mass of electron.*
- MA** *Mathematical Association.*
- MAC** *Magnetic automatic calculator; mechanical analogue computer.*
- MADAM** *Manchester automatic digital machine.*
- MADRE** *Magnetic drum receiving equipment (U.S. Navy).*
- MADT** *Microalloy diffused-base transistor.*
- mag** *Magnetron.*
- magamp** *Magnetic amplifier.*
- MAGGI** *Million ampere generator at Aldermaston, used in thermonuclear studies.*
- MAGIC** *Magnetic and germanium integer calculator.*
- MANIAC** *Mathematical analyser numerical indicator and computer (U.S.).*
- MAR** *Memory address register.*
- MARS** *Military affiliated radio system.*
- MAT** *Micro-alloy transistor, suitable for VHF logical switching.*
- mA/V** *Milliamperes per volt, valve transconductance.*
- MAVAR** *Mixed (or modulating) amplification by variable reactance; see parametric amplifier in main text.*
- MB** *Multi-band; mobile base; millibar; memory buffer.*
- MBC** *Mutual broadcasting system; miniature bayonet cap.*
- MBR** *Memory buffer register.*
- MC** *Mobile (or master) control; moving-coil.*
- mc** *Megacycle/second (U.S.); metre-candle.*
- mCi** *Millicurie.*
- MCM** *Monte Carlo method.*
- MCR** *Mobile control room.*
- Mc/s, mcps** *Megacycles per second.*
- MCW** *Modulated continuous wave.*
- MD** *Magnetic deflection in CRT.*
- M-D** *Modulation-demodulation.*
- Md** *Mendelevium.*
- MDE** *ITU abb. for mobile telemetering station.*
- MDF** *Main distribution frame for circuits.*
- MDI** *Magnetic direction indicator.*
- MDR** *Memory data register; multichannel data recorder.*
- MDS** *Minimum discernible signal.*
- MDT** *Mean down time.*
- ME** *Magic eye.*
- MEA** *Beta mercaptoethylamine (cysteamine).*
- MEMISTOR** *Memory resistor storage device.*
- MERLIN** *Medium-energy reactor light-water industrial neutron source, a swimming-pool type of research reactor (AEI).*
- MES** *Miniature Edison screw.*
- MET** *Meteorological; metallurgy.*
- MEW** *Microwave early warning.*
- MF** *Magnetic focus of CRT; medium frequency.*
- mfd** *Microfarad. (Obs., now replaced by  $\mu\text{F}$ .)*
- mfp** *Mean free path.*
- mft** *Mean free time.*
- Mft L** *Millifoot lamberts.*
- MG** *Motor generator.*
- Mg** *Magnesium.*
- mg** *Milligram(me).*
- mH** *Millihenry.*
- MHCP** *Mean horizontal candle-power.*
- MHD** *Magnetohydrodynamics.*
- MHz** *Megahertz.*
- MICR** *Magnetic ink character recognition.*
- MIDAC** *Michigan digital automatic computer.*
- MIDAR** *Microwave detection and ranging.*
- MIG** *Miniature integrating gyroscope for inertial navigation.*
- mil** *Military (equipment designation).*
- min** *Minute; minimum.*
- MINNI** *A half-scale version of MAGGI.*
- Mintech** *Ministry of Technology.*
- MIR** *Memory information register.*
- MIT** *Massachusetts Institute of Technology.*
- mix** *Frequency mixer.*
- MK** *Morse key.*
- mk** *Mark of equipment.*
- MKG** *Metre-kilogram(me).*
- MKS** *Metre-kilogram(me)-second system of units.*
- MKSA** *Metre-kilogram(me)-second-ampere, system of units recently adopted by the International Electrotechnical Commission, in place of all other systems of units.*
- ML** *Mutual inductance.*



- ml** Millilitre.  
**MLD** Minimum lethal dose of radiation.  
**MLT** Maximum lethal time of exposure to radiation, for 80% fatalities.  
**MM** Megamega- (prefix for  $\times 10^{12}$ ).  
**MMA** Multiple module access.  
**m.m.f.** Magnetomotive force, driving magnetic flux.  
**mmu** Milli atomic mass unit.  
**Mn** Manganese.  
**MO** Master oscillator; manually-operated.  
**Mo** Molybdenum.  
**mod.** Model; modulation; modification.  
**MODEM** Combined modulator and demodulator.  
**MOH** ITU abb. for mobile hydrological and meteorological station.  
**mol** Symbol for mole.  
**mon.** Monitor.  
**MONECA** Motor network calculator.  
**MOOSE** Man out of space easily, U.S. space travel survival capsule.  
**MOPA** Master oscillator power amplifier.  
**MOS** Metal oxide semiconductor; Ministry of Supply.  
**MOSAIC** Ministry of Supply automatic integrator and computer.  
**MOST** Metal oxide semiconductor transistor.  
**MOUSE** Minimum orbital unmanned satellite earth.  
**m.p.** Melting-point in degrees.  
**MPC** Maximum permissible concentration.  
**Mpc** Megaparsec.  
**MPD** Maximum permissible dose of gamma- or X-rays.  
**MPE** Maximum permissible exposure.  
**MPL** Maximum permissible level of gamma- or X-rays.  
**MPX** Multiplex.  
**MR** Magnetic recorder.  
**mr** Milliröntgen; millirad; millirem.  
**MRC** Medical Research Council.  
**MSAC** Moore School automatic computer.  
**MSB** Most significant bit.  
**MSC** Mile of standard cable.  
**MSCP** Mean spherical candle-power.  
**MSF** Medium standard frequency.  
**MSL** Mean sea level.  
**MST** Mountain standard time.  
**MT** Mean time.  
**Mt** Megaton.  
**MTD** Mean temperature difference.  
**MTI** Moving target indicator radar.  
**MTR** Materials-testing reactor.  
**Mu** Mutual conductance in valve.  
**MUF** Maximum usable frequency.  
**MUPO** Maximum undisturbed power output.  
**MV** Medium voltage; megavolt.  
**Mv** Mendelevium. (obs.)  
**mV** Millivolt.  
**MVC** Manual volume control.  
**mV/m** Millivolts per metre.  
**MW** Medium wave; megawatt.  
**mW** Milliwatt.  
**MWd/t** Megawatt days per tonne.  
**MW(t)** Megawatt (thermal), unit for heat power generated in a nuclear reactor, which has to be extracted by a coolant.  
**MWV** Maximum working voltage.  
**Mx** Multiplex.  
**N** Neper; Avogadro number; nitrogen; newton, shear modulus.  
**N** Symbol for number of turns.  
**n** Nano- (prefix for  $\times 10^{-9}$ ); neutron; principal quantum number; refractive index.  
**NA** Numerical aperture; not applicable; Nautical Almanac.  
**Na** Sodium.  
**NAB** National Association of Broadcasters (U.S.).  
**NAFEC** National Aviation Facilities Experimental Centre of the U.S. Federal Aviation Agency.  
**NAS** National Academy of Sciences (U.S.).  
**NASA** National Aeronautics and Space Administration (U.S.).  
**NATRON** National Cash Register electronic data-processing system.  
**NAVAR** Combined navigation and radar system.  
**NB** No bias.  
**Nb** Niobium.  
**NBC** Noise balancing circuit.  
**NBFM** Narrow band frequency modulation.  
**NBS** National Bureau of Standards.  
**NC** Not connected (on tube bases); normally closed contact of relay; neutralizing capacitance or coil; no connection, applicable to valve pins.  
**N/C** Numerical control.  
**Nd** Neodymium.  
**NDB** Radio DF beacon (CAP).  
**NDT** Non-destructive testing.  
**Ne** Neon.  
**NEC** National Electronics Conference.  
**NEMA** National Electrical Manufacturing Association.  
**NEPTUNE** An enriched-fuel, zero-energy experimental reactor (Harwell).  
**NERC** National Electronics Research Council.  
**NERO** Sodium (Na) experimental reactor of zero power (Winfrith)—a zero-energy graphite-moderated reactor system used to simulate a number of reactor systems.  
**NESTOR** Neutron source thermal reactor (Winfrith), a modification of JASON.  
**NF** Noise psophometric factor.  
**Nf** Nanofarad.  
**NFB** Negative feedback.  
**NI** Non-inductive.  
**Ni** Nickel.  
**NIC** Not in contact.  
**NIMROD** A code name for the 7 GeV proton synchrotron (Rutherford Laboratory).  
**NIO** National Institute of Oceanography.  
**NIRNS** National Institute for Research in Nuclear Science, which operates the high-energy Rutherford Laboratory at Harwell.  
**NLR** Noise load ratio.  
**nm** Nautical mile.  
**NMR** Nuclear magnetic resonance.  
**No** Nobelium.  
**n.o.** Normally open.  
**NORC** Naval Ordnance research computer (U.S.).