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E-BOAT - Enemy war motorboat (British, *circa* World War II) []

E-LAYER - See IONOSPHERE.

E-MAIL BOMB - An automated script which generates a chain of e-mail messages intended to overload the resources of the victim server processor, or Mail Transfer Agent (MTA). [10:2862] Also called DENIAL OF SERVICE (DOS) ATTACK. See also MAILBOMB. NOTE: E-mail bombs include chain bombs, error-message bombs, covert distribution, and mail exploder exploitation, among other techniques.

E-M CHART - See ENERGY-MANEUVERABILITY DIAGRAM.

EARLY WARNING AND CONTROL SYSTEM (EWCS) - A ballistic defense radar system that can maintain constant surveillance of the threat horizon and rapidly detect ballistic missiles at launch distances of more than 1,500 kilometers (930 miles), automatically initiating and maintaining target tracking. It produces a high-resolution image of targets down to less than 1 meter in size, facilitating identification of the threat and discrimination of the warhead. Jam resistant, the EWACS can track multiple threats simultaneously while maintaining full surveillance. In addition, radar data identifies the launch point, predicts the flight track and evaluates the impact point. [10:2783]

EARTHING - The process of making a satisfactory electrical connection between the structure, including metal skin, of an object or vehicle, and the mass of the earth, to insure a common potential with the earth. [1.1] See also BONDING, GROUNDING.

EAVESDROPPING - See PROMISCUOUS MODE.

ECHELON - An intelligence global surveillance network for intercepting and processing the world's communications using numerous satellites, microwave listening stations and subsurface assets. []

ECHO - In radar, the portion of energy of the transmitted pulse that is reflected to a receiver. [3] See also RADAR ECHO.

ECM INTERROGATION - The use of RF transmissions that closely simulate friendly weapons system RF transmissions in order to generate adversary ECM

responses. [10:36] NOTE: Information from ECM interrogation is used by designers of ECCM systems.

EDGE TRACKING - An ECCM technique which uses only the leading (or trailing) edge of the target pulse for range tracking. [8]

EFFECTIVE, AFFORDABLE, REUSABLE SPEECH-TO-TEXT (EARS) - A Defense Advanced Research Project Agency (DARPA) Total Information Awareness (TIA) program to develop speech-to-text automatic transcription technology. [10:2969]

EFFECTIVE DAMAGE - That damage necessary to render a target element inoperative, unserviceable, nonproductive, or uninhabitable. [1.1]

EFFECTIVE RADIATED POWER (ERP) - In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half-wave dipole multiplied by the net power accepted by the antenna from the connected transmitter. [3]

EFFECTS BASED OPERATIONS (EBO) - The use of advanced technologies to help understand the enemy as a "system of systems." [10:2901] NOTE: Effects based operations involves the examination of an adversary's military might as well as political, economic, cultural and decision-making factors in order to find weaknesses that can be exploited to defeat an enemy's ability to make war.

EFFLUENT/DEBRIS COLLECTION - Intelligence gathered from atmospheric effluents and debris. [10:129] NOTE: Effluent/debris collection is a subcategory of **MATERIALS INTELLIGENCE**, a component of **MEASUREMENT AND SIGNATURE INTELLIGENCE (MASINT)**.

EJECTION INTERVAL - The time between the dispensing of individual decoys within a salvo or burst. [] Contrast with **SALVO INTERVAL**.

ELASTOMER - A silicon strip of alternating conductors and insulators used in printed circuit boards. []

E-LAYER - See **IONOSPHERE**.

ELECTRIC ARMOR - A means of protecting an object from projectile collision. **SHAPE MEMORY ALLOYS (SMA)** are heated with pulsed electrical power at the instant of collision, augmenting the effective thickness of the shield, thereby increasing its resistance to penetration. [] Also called **PULSED POWER SYSTEM**. See also **ELECTROMAGNETIC ARMOR**. NOTES: (1) NASA is considering using

electric armor to shield the new International Space Station from potentially dangerous collisions with space debris. (2) Charged capacitors electrify the armor with several thousand volts. When a shaped-charge hits the armor, its jet of hot copper is dispersed by thousands of amperes of current surging through the metal plates. The warhead's remaining metal fragments are absorbed by the armor plating. [10:2962]

ELECTRICAL MATERIALS - That category of **MATERIALS TECHNOLOGY** which addresses superconducting electrical materials that provide the capability for lightweight, compact, high-power motors, magnets, and energy storage systems. [12]

ELECTRICAL STUN DEVICE - A **NONLETHAL WEAPON** which stuns target individuals with a high voltage, very low current, short duration electric shock that incapacitates the individual. [10:2745]

ELECTRODYNAMIC TETHER - A space-based current-carrying wire that harnesses the Earth's magnetic field to provide propulsive force. [10:2835]

ELECTROEXPLOSIVE DEVICE (EED) - Tiny explosive charges used to trigger weapon systems, ejection seats, or to jettison bombs and fuel tanks. []

ELECTROLUMINESCENCE - (1) The emission of light from a phosphor excited by an electromagnetic field. (2) Nonthermal conversion of electrical energy into light, such as in a light-emitting diode. [3*]

ELECTROLUMINESCENT (EL) DISPLAY - An optoelectronic device with a multiplicity of electric ports, each capable of independently producing an optic output from an associated electroluminator element. [3]

ELECTROMAGNETIC AIRCRAFT LAUNCHING SYSTEM (EMALS) - An electrically-powered catapult system intended to replace the steam-powered catapult. [10:2697] **NOTE:** Although EMALS will require increased electrical capacity in aircraft carriers, the system will increase safety by eliminating steam lines, and reducing weight, maintenance, and personnel requirements.

ELECTROMAGNETIC ARMOR - A form of **ACTIVE ARMOR** that is an application of **SMART ARMOR** which offers protection as follows: (1) The penetrating jet of a shaped charge (SC) is detected; (2) an intense electrical discharge is created between electrically conductive plates, creating a powerful magnetic field; (3) the magnetic field interacts with the charged particles of the penetrating jet; and (4) magnetohydrodynamic instabilities occur, disrupting the jet. [10:2719] See also **ELECTRIC ARMOR**, **REACTIVE ARMOR**.

ELECTROMAGNETIC BOMB - See **ELECTROMAGNETIC WEAPON**.

ELECTROMAGNETIC COMPATIBILITY (EMC) - (1) The ability of a device to function satisfactorily in its **ELECTROMAGNETIC ENVIRONMENT** without introducing intolerable disturbance to that environment (or to other devices). [3] (2) The ability of systems, equipment, and devices that utilize the electromagnetic spectrum to operate in their intended operational environments without suffering unacceptable degradation or causing unintentional degradation of electromagnetic radiation or response. It involves the application of sound electromagnetic spectrum management; system, equipment, and device design configuration that ensures interference-free operation; and clear concepts and doctrines that maximize operational effectiveness. [7:CJCS MOP 6, APPENDIX B]

ELECTROMAGNETIC DECEPTION - The deliberate radiation, re-radiation, alteration, suppression, absorption, denial, enhancement, or reflection of electromagnetic energy in a manner intended to convey misleading information to an enemy or to enemy electromagnetic-dependent weapons, thereby degrading or neutralizing the enemy's combat capability. Among the types of electromagnetic deception are: a. Manipulative Electromagnetic Deception -- Actions to eliminate revealing, or convey misleading, electromagnetic telltale indicators that may be used by hostile forces. b. Simulative Electromagnetic Deception -- Actions to simulate friendly, notional, or actual capabilities to mislead hostile forces. c. Imitative Electromagnetic Deception -- The introduction of electromagnetic energy into enemy systems that imitates enemy emissions. [7:CJCS MOP 6, APPENDIX B]

ELECTROMAGNETIC ENVIRONMENT - The resulting product of the power and time distribution, in various frequency ranges, of the radiated or conducted electromagnetic emission levels that may be encountered by a military force, system, or platform when performing its assigned mission in its intended operational environment. It is the sum of **ELECTROMAGNETIC INTERFERENCE**; **ELECTROMAGNETIC PULSE**; **HAZARDS OF ELECTROMAGNETIC RADIATION TO PERSONNEL, ORDNANCE, AND VOLATILE MATERIALS**; and natural phenomena effects, such as lightning and aurora. [1.1]

ELECTROMAGNETIC ENVIRONMENT ALLOCATION - The process of assigning spectral regions to sensors, active radiation devices, and reflectors in order to regulate emissions, minimize mutual interference, and carry out the force **EMISSION CONTROL (EMCON)** plan. []

ELECTROMAGNETIC ENVIRONMENTAL EFFECTS (E3) - The impact of the **ELECTROMAGNETIC ENVIRONMENT** upon the operational capability of military forces, equipment, systems, and platforms. It encompasses all electromagnetic disciplines, including **ELECTROMAGNETIC COMPATIBILITY/ELECTROMAGNETIC INTERFERENCE**;

ELECTROMAGNETIC VULNERABILITY; ELECTROMAGNETIC PULSE; ELECTRONIC COUNTER-COUNTERMEASURES; HAZARDS OF ELECTROMAGNETIC RADIATION TO PERSONNEL, ORDNANCE AND VOLATILE MATERIALS; and natural phenomena effects of lightning and PRECIPITATION STATIC. []

ELECTROMAGNETIC INDUCTION DETECTOR - A fast-response device used to locate mines and other metallic objects by determining the time constant rate of decay of induced electromagnetic radiation. []

ELECTROMAGNETIC INTERFERENCE (EMI) - Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment. It can be induced intentionally, as in some forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and the like. [1.1]

ELECTROMAGNETIC INTERFERENCE (EMI) GASKET - A monel mesh gasket, impregnated with silicone gel, to seal a surface on contact and keep the electrolyte away from the metal-to-metal interface, which is otherwise subject to galvanic corrosion due to conductive metal powders used in the gasket. [10:2540]

ELECTROMAGNETIC INTRUSION - The intentional insertion of electromagnetic energy into transmission paths in any manner, with the objective of deceiving operators or of causing confusion. See also INTRUSION. [1.1]

ELECTROMAGNETIC JAMMING - The deliberate radiation, re-radiation, or reflection of electromagnetic energy for the purpose of preventing or reducing an enemy's effective use of the ELECTROMAGNETIC SPECTRUM, and with the intent of degrading or neutralizing the enemy's combat capability. [7:CJCS MOP 6, APPENDIX B] See also ELECTRONIC JAMMING. Listen to various electronic jamming signals: Bagpipes; Crypto Spoofing; FSK Spoofing; Modulated White Noise; Random Tones; Sine Wave (1 kHz); Square Wave (500 Hz); Stepped Tones; Swept Tones; Tone Jamming; White Noise.

ELECTROMAGNETIC OBSCURANT - Smoke, dust, mist, and other particular material deliberately generated to degrade the enemy's sensors and deny detailed information about the protected unit(s). [] See also AEROSOL.

ELECTROMAGNETIC PULSE (EMP) - The electromagnetic radiation from a nuclear explosion caused by Compton-recoil electrons and photoelectrons from photons scattered in the materials of the nuclear device or in a surrounding medium. The resulting electric and magnetic fields may couple with electrical / electronic

systems to produce damaging current and voltage surges. May also be caused by non-nuclear means. [1.1] Also called NUCLEAR MAGNETIC PULSE (NEMP). See also NEMP COUNTERMEASURES, INDUCED ELECTROMAGNETIC PULSE (IEMP), SYSTEM-GENERATED ELECTROMAGNETIC PULSE (SGEMP), FARADAY CAGE. NOTES: (1) A single high-altitude nuclear burst of 10 or more megatons at the geographic center of North America would, within 3 to 5 NANoseconds, disable virtually every kind of unprotected electronic and electrical circuit. Damage to crucial weapons control systems could be irreversible within the limited time available to respond. [10:2541] (2) Three notable EMP weapons that are currently (*circa* 2000) under research are the explosive- or propellant-driven FLUX COMPRESSION GENERATORS, Magneto-HYDRODYNAMIC generators, and the VIRTUAL CATHODE OSCILLATOR.

ELECTROMAGNETIC RADIATION - Radiation made up of oscillating electric and magnetic fields and propagated with the speed of light. Includes gamma radiation, X-rays, ultraviolet, visible, and infrared radiation, and radar and radio waves. [1.1]

ELECTROMAGNETIC RADIATION ABSORPTION - See ABSORPTION.

ELECTROMAGNETIC RADIATION HAZARDS (RADHAZ) - Hazards caused by a transmitter / antenna installation that generates ELECTROMAGNETIC RADIATION in the vicinity of ordnance, personnel, or fueling operations in excess of established safe levels or increases the existing levels to a hazardous level. These hazards will exist when an electromagnetic field of sufficient intensity is generated to: a. Induce or otherwise couple currents and/or voltages of magnitudes large enough to initiate electro-explosive devices or other sensitive explosive components of weapon systems, ordnance, or explosive devices. b. Cause harmful or injurious effects to humans and wildlife. c. Create sparks having sufficient magnitude to ignite flammable mixtures of materials that must be handled in the affected areas. [1.1] Synonymous with EMR Hazards, and HAZARDS OF ELECTROMAGNETIC RADIATION TO PERSONNEL, ORDNANCE, AND VOLATILE MATERIAL (HERO). . [11.2]

ELECTROMAGNETIC RADIATION REFLECTION - The abrupt change in direction of an electromagnetic WAVE at an interface between two dissimilar media so that the wave returns into the medium from which it originated. See also SKIN ECHO. [3]

ELECTROMAGNETIC RADIATION SHIELDING - The protection of a device from electromagnetic radiation by an electromagnetic shield. The shield consists of a screen, housing, or other object, usually conducting, that substantially reduces the effect of electric or magnetic fields on one side thereof, upon devices or circuits on the other side. [3]

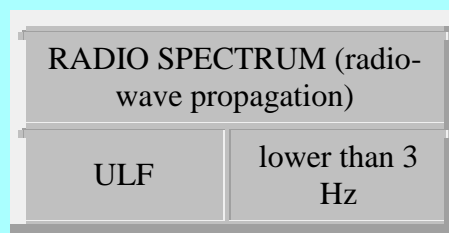
ELECTROMAGNETIC RADIATION SIGNATURE - (1) As applied to a radar, its specific radiation parameters that may allow it to be distinguished from all others, even of the same type. [8] (2) Radiated signals clearly indicating the system mode of operation, purpose, and to a certain extent the variety of countermeasure action likely to prove most profitable. [10:2] (3) Characteristics associated with an emitter, such as Carrier frequency; Pulse repetition frequency (PRF); Pulse width (PW); Antenna scan rate; Antenna scan pattern; Antenna SIDE LOBE structure; and Message contents (AM, FM, digital, etc.). [10:2]

ELECTROMAGNETIC RAIL GUN (EMR) - A kinetic-kill weapon comprising two Teflon-coated rails which both accelerate and guide the projectile, typically housed in a "sabot" like structure that splits apart and sheds itself from the projectile after leaving the rail gun. The projectile itself may be a ten-pound needle-shape about 1 foot and half long and 1.5 inches in diameter. The pulsed electric current passed along the two rails via a connecting armature forms a magnetic field which accelerates the projectile along the gun 'barrel', each pulse adding increased energy so that the projectile's target velocity may reach nearly 2500 kilometers per second. At this speed the projectile superheats to a point that exceeds the ability of steel or other armor to withstand it, and thus passes through the armor as if it were butter. Once inside the protected area, the projectile delivers a shock wave and heat wave, destroying the contents of the interior of the vehicle or building. [] See also **KINETIC KILL VEHICLE (KKV)**. NOTES: Although huge amounts of power are required to accelerate projectiles to such speeds, the rail gun has advantages, among which: (1) It is easier to maintain; (2) because its rounds are basically inert, they are relatively safe to store; (3) its speed makes it hard to counter; and (4) it is both light and accurate.

ELECTROMAGNETIC REFLECTION - Electromagnetic energy diverted back from the interface of two media. The reflection may be specular (*i.e.*, direct) or diffuse according to the nature of the contact surfaces. [1.1]

ELECTROMAGNETIC RERADIATION - See **RERADIATION**.

ELECTROMAGNETIC SPECTRUM - The range of frequencies of electromagnetic radiation from zero to infinity. Also called **FREQUENCY SPECTRUM**. It is divided into 11 radio-wave propagation frequency ranges.



ELF	3 Hz - 3 kHz
VLF	3 - 30 kHz
LF	30 - 300 kHz
MF	300 kHz - 3 MHz
HF	3 - 30 MHz
VHF	30 - 300 MHz
UHF	300 MHz - 3 GHz
SHF	3 - 30 GHz
EHF	30 - 300 GHz
Submillimeter	300 GHz - 1 THz
Source [3]	

Alternatively, it is divided into 26 alphabetically designated bands. ECM Bands **A** through **M** are listed below: [1.1] NOTE: X-Band radars operate in the range 8-12 GHz.

Band	Low-End Freq (GHz)
A	0.0
B	0.25
C	0.5
D	1
E	2
F	3
G	4
H	6
I	8

J	10
K	20
L	40
M	60

[Source: International Countermeasures Handbook] [11.2] (Note: Other bands include: P – 230-1,000 MHz; L – 1,000 – 2,000 MHz; S – 2,000 – 4,000 MHz; C – 4,000 – 8,000 MHz; X – 8,000 – 12,500 MHz; K_u - 12.5 – 18 GHz; K 18 – 26.5 GHz; K_a – 26.5 – 40 GHz; and Millimeter > 40 GHz)

ELECTROMAGNETIC VULNERABILITY (EMV) - The characteristics of a system that cause it to suffer a definite degradation (incapability to perform the designated mission) as a result of having been subjected to a certain level of **ELECTROMAGNETIC ENVIRONMENTAL EFFECTS**. [1.1]

ELECTROMAGNETIC WEAPON - Any device which can produce an electromagnetic field of such intensity that targeted items of electronic equipment experience either a **SOFT KILL** or a **HARD KILL**. [10:2824]

ELECTROMAGNETICALLY INDUCED TRANSPARENCY (EIT) - A technique that makes normally opaque substances transparent to light by applying another source of light, such as a laser beam, that interferes with the opaque substance's absorption of light. [10:2882] NOTE: This property was first demonstrated (*ca* 2000) by Harvard physicist Lene Hau. A pulse of light was stopped, stored briefly within a substance, and then released on command.

ELECTRONIC ATTACK (EA) - That division of **ELECTRONIC WARFARE** involving the use of electromagnetic or directed energy to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability. Electronic Attack includes: (1) Actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum, such as jamming and electromagnetic deception; and (2) Employment of weapons that use either electromagnetic or **DIRECTED ENERGY (DE)** as their primary destructive mechanism (**LASER**, **RF weapons**, **PARTICLE BEAMS**). [7:CJCS MOP 6; APPENDIX B] Also called **ELECTRONIC COUNTERMEASURES (ECM)**.

ELECTRONIC CAMERA - A camera which records the image on a floppy diskette. The diskette may then be played back into a video imaging terminal where the recorded image is digitized, compressed and prepared for radio transmission. [10:100]

ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS) - A system which allows civilian ships to navigate safely without paper charts. []

ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS-N) - A system which allows naval ships to navigate safely without paper charts. One difference between ECDIS and ECDIS-N is that ECDIS-N requires use of DIGITAL NAUTICAL CHARTs (DNC®) produced by the National Mapping and Imagery Agency (NIMA).

ELECTRONIC COMBAT (EC) - (1) The ELECTRONIC WARFARE MISSION AREA involving the integrated use of military action to preserve friendly access to the electromagnetic spectrum and to exploit and disrupt enemy military objectives. [4:25] (2) A SPACE AND ELECTRONIC WARFARE (SEW) warfare discipline that targets enemy weapons and weapons systems. It includes the coordination of all measures to provide counter-targeting, counter-weapon, and terminal phase protection to the force. [10:2505] NOTE: Electronic Combat is described as having the core elements "Detect, Disrupt, and Defend". [10:2520]

ELECTRONIC COUNTER-COUNTERMEASURES (ECCM) - That division of ELECTRONIC WARFARE involving actions taken to insure friendly effective use of the ELECTROMAGNETIC SPECTRUM despite the enemy's use of electronic warfare. [1.1] Synonymous with ELECTRONIC PROTECTION; ELECTRONIC PROTECTIVE MEASURES (EPM)

ELECTRONIC COUNTERMEASURES (ECM) - That division of ELECTRONIC WARFARE (EW) involving actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum. [1.1] Synonymous with ELECTRONIC ATTACK (EA).

ELECTRONIC COVER - Protection measures employing electronic means. See also COVER; OPERATIONAL COVER. []

ELECTRONIC DECEPTION - An electronic countermeasure that is the deliberate radiation, reradiation, alteration, suppression, absorption, denial, enhancement, or reflection of electromagnetic energy in a manner intended to convey misleading information and to deny valid information to an enemy or to enemy electronics-dependent weapons. See also DECEPTION. [1.1]

ELECTRONIC IMAGERY DISSEMINATION - The transmission of imagery or imagery products by any electronic means. This includes the following four categories: a. primary imagery dissemination system: The equipment and procedures used in the electronic transmission and receipt of unexploited original or near-original

quality imagery in NEAR REAL TIME. b. primary imagery dissemination: The electronic transmission and receipt of unexploited original or near-original quality imagery in near-real time through a primary imagery dissemination system. c. secondary imagery dissemination system: The equipment and procedures used in the electronic transmission and receipt of exploited non-original quality imagery and imagery products in other than real or near-real time. d. secondary imagery transmission: The electronic transmission and receipt of exploited non-original quality imagery and imagery products in other than real or near-real time through a secondary imagery dissemination system. [1.1]

ELECTRONIC INFORMATION SECURITY - Electronic information security is a collection of disciplines which encompass a wide range of applications and environments. These disciplines are tailored to one or more areas of protection, such as **COMMUNICATIONS SECURITY (COMSEC)**, and computer security. Electronic information security involves: *cryptology*, which consists of encryption and decryption process; *keys*, which are variables used to periodically change the encryption algorithm so that even if an adversary captures the encrypted information and possesses the algorithm they cannot easily decrypt the information without the key; *key distribution*, which is the method of placing periodic keys where they are needed (electronically or physically); *access control*, by which the person attempting electronic access to information is validated as being the person claimed to be (authentication), and the electronic restrictions by which only authorized persons are granted access to specified information; *tamper protection*, a series of processes, both electronic and physical, established to detect attempts to physically intrude on electronic information or tamper with the security parameters tamper protection also includes protective measures taken in the event of intrusion); and *recovery*, which is the restoration of operations after a system failure, and includes fail-safe features to prevent information loss or compromise from detectable forms of failure. [10:2564]

ELECTRONIC INTELLIGENCE - See **ELECTRONICS INTELLIGENCE (ELINT)**.

ELECTRONIC JAMMING - An electronic countermeasure that is the deliberate radiation, re-radiation, or reflection of electromagnetic energy for the purpose of disrupting enemy use of electronic devices, equipment, or systems. [1.1] See also **ELECTROMAGNETIC JAMMING, RERADIATION**. Listen to various electronic jamming signals: Bagpipes; Crypto Spoofing; FSK Spoofing; Modulated White Noise; Random Tones; Sine Wave (1 kHz); Square Wave (500 Hz); Stepped Tones; Swept Tones; Tone Jamming; White Noise.

ELECTRONIC KNEEBOARD - A computer display intended for use in attack vehicles, such as the console of the A-10 Thunderbolt II. The electronic kneeboard would give the pilots a visual, close-up look at what the ground troops want them

to see using digital pictures uploaded from the ground, thus providing the pilots with better situation awareness. [10:3052] Also called a MADDEN KNEEBOARD. NOTE: A goal of the program is to provide a TELESTRATOR or "John Madden pencil" to draw lines and diagrams on the television screen. This would allow both ground forces and pilots to mark the pictures to indicate where the positions of the enemy, friendly forces, and other points of tactical interest.

ELECTRONIC LINE OF SIGHT - The path traversed by electromagnetic waves that is not subject to reflection or refraction by the atmosphere. [1.1]

ELECTRONIC MAIL (E-MAIL) - A system whereby a computer user can exchange messages with other computer users (or groups of users) via a communications NETWORK. [10:2736] NOTE: Electronic mail is one of the most popular uses of the Internet.

ELECTRONIC MASKING - The controlled radiation of electromagnetic energy on friendly frequencies in a manner to protect the emissions of friendly communications and electronic systems against enemy ES/SIGINT (electronic warfare support measures/signals intelligence), without significantly degrading the operation of friendly systems. [7:CJCS MOP 6, APPENDIX B]

ELECTRONIC NOTARY - An organization which provides electronic time-stamping services. See also ELECTRONIC TIME STAMP. []

ELECTRONIC ORDER OF BATTLE (EOB) - The identification, location, and disposition of electronic systems of a military organization. [] NOTE: When the electronic systems of interest are limited to radar systems, the corresponding term is RADAR ORDER OF BATTLE.

ELECTRONIC POSTMARK (EPM) - A form of digital certification that appends to an e-mail message a date-time group that would be legally valid in a court. [] NOTE: E-mail messages which have electronic postmarks are accompanied by a special icon which, if clicked, will reveal the date-time group of the message.

ELECTRONIC PROTECTION (EP) - (1) That division of ELECTRONIC WARFARE involving actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy employment of electronic warfare that degrade, neutralize, or destroy friendly combat capability. [7:CJCS MOP 6, APPENDIX B] (2) That division of INFORMATION WARFARE (IW) involving measures used to defeat ELECTRONIC ATTACK (EA). [12] (3) The protection of forces against any friendly or enemy employment of Electronic Warfare that would degrade or deny friendly force combat capabilities. Electronic Protection addresses the EW problem of

electronic interference and electronic fratricide. Formerly [10:2463], and synonymous [12] with ELECTRONIC COUNTER-COUNTERMEASURES.

ELECTRONIC PROTECTIVE MEASURES (EPM) - See ELECTRONIC COUNTER-COUNTERMEASURES (ECCM)

ELECTRONIC RECONNAISSANCE - The detection, identification, evaluation, and location of foreign electromagnetic radiation emanating from other than nuclear detonations or radioactive sources. [1.1]

ELECTRONIC SUPPORT MEASURES - See ELECTRONIC WARFARE SUPPORT MEASURES.

ELECTRONIC TAGGING - A system consisting of a light-weight wrist strap data tag, both waterproof and protected against electrostatic discharge, containing miniature non-volatile memory modules, which is secured on a person (say, a prisoner). Data describing the person is then loaded into the wrist-strap data tag where it remains until no longer needed (e.g., the prisoner's release). The other part of this system uses a PC-based handheld reader for reading and writing of the data tag. Data are then uploaded to a remote PC. The data tags can hold up to 100 times more data than the average bar code. Electronic tagging may also be used for hospital patients, inventory control, and security marking of property. [10:2527]

ELECTRONIC TIME STAMP - The marking of a digital document (data file, audio track, video track, photograph, etc.) with a digital time-of-receipt fingerprint unique to the document to subsequently establish chronology and prove authenticity. In order to prevent backward or forward dating by the time-stamping service, each digital signature is linked to the preceding time stamp. See also ELECTRONIC NOTARY. []

ELECTRONIC WARFARE (EW) - (1) Military action involving the use of electromagnetic energy to determine, exploit, reduce or prevent hostile use of the electromagnetic spectrum and action which retains friendly use of the electromagnetic spectrum. Also called EW. There are three divisions within electronic warfare: (a) ELECTRONIC COUNTERMEASURES, (b) ELECTRONIC COUNTER-COUNTERMEASURES, and (c) ELECTRONIC WARFARE SUPPORT MEASURES. [1.1] (2) Any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. The three major subdivisions within electronic warfare are *electronic attack*, *electronic protection*, and *electronic warfare support*: **a. *Electronic Attack*** (EA). That division of electronic warfare involving the use of electromagnetic or directed energy to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability. Electronic Attack includes: 1) Actions taken to

prevent or reduce an enemy's effective use of the electromagnetic spectrum, such as jamming and electromagnetic deception; and 2) Employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism (laser, RF weapons, particle beams). **b. *Electronic Protection*** (EP). That division of electronic warfare involving actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy employment of electronic warfare that degrade, neutralize, or destroy friendly combat capability. **c. *Electronic Warfare Support*** (ES). That division of electronic warfare involving actions tasked by, or under direct control of, an operational commander to search for, intercept, identify, and locate sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition. Thus, electronic warfare support provides information required for immediate decisions involving electronic warfare operations and other tactical actions such as threat avoidance, targeting, and homing. Electronic warfare support data can be used to produce signals intelligence (SIGINT), both COMMUNICATIONS INTELLIGENCE (COMINT) and ELECTRONICS INTELLIGENCE (ELINT). [7:CJCS MOP 6, APPENDIX B] See also NAVIGATION WARFARE (NAVWAR) NOTES: (1) Electronic warfare is a part of offensive information operations. (2) The NAVWAR Joint Warfighting Science and Technology Plan (*circa* 2000) defines ELECTRONIC WARFARE as "The capability for DECEIVING, disrupting, and destroying the SURVEILLANCE and COMMAND AND CONTROL (C²) systems as well as the weapons of an enemy's integrated air defense network and the capability for recognizing attempts by hostile systems to track and engage."

ELECTRONIC WARFARE BATTLE TIMELINE - The sequence of events relating to a naval engagement are pre-timeline planning; surveillance / reconnaissance; acquisition; targeting; weapons direction and guidance; homing and fuzing; and post-timeline assessment. [10:43] NOTE: The sequence may cycle through the first two, three, or four events indefinitely in non-weapon exchange situations.

ELECTRONIC WARFARE COMMAND AND CONTROL (EWC2) - The exercise of authority and direction by a properly designated EW commander over assigned forces in the accomplishment of the EW mission. EW command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the EW mission. [Adapted from the definition of Command and Control in reference 1]

ELECTRONIC WARFARE EFFECTIVENESS ASSESSMENT - The determination of the degree to which EW action achieved the desired result. See also **BATTLE DAMAGE ASSESSMENT**. [] NOTE: This measure may be estimated through analysis of data collected by both active and passive means - for example, by using radar or visual systems to detect changes in enemy weapons flight and trajectory profiles; or by using ESM to detect

changes in the mode of radiated signals, communications volume, and other transmitted signal characteristics.

ELECTRONIC WARFARE EXPENDABLES - Non-recoverable EW devices such as CHAFF, flares, unmanned vehicles, DECOYS, and HAND-EMPLACED JAMMERS. [7:CJCS MOP 6, APPENDIX B]

ELECTRONIC WARFARE FREQUENCY DECONFLICTION - Actions taken to integrate those frequencies used by electronic warfare systems into the overall FREQUENCY DECONFLICTION process. [7:CJCS MOP 6, APPENDIX B]

ELECTRONIC WARFARE MISSION - The task, together with the purpose, which clearly indicates the EW action to be taken, the spectral region to be covered, and the reason therefore. []

ELECTRONIC WARFARE MISSION AREA - A level in the EW classification hierarchy. The EW Mission Areas are: ASSESSMENT; C3 PROTECTION; COUNTER-C3; COVER AND DECEPTION; CRYPTOLOGIC SUPPORT; ELECTRONIC COMBAT (EC); EW BATTLE MANAGEMENT; EW DIRECTION & COORDINATION; EW LOGISTICS; INDICATIONS & WARNING (I&W); INTELLIGENCE SUPPORT; SURVIVABILITY ENHANCEMENT; TACTICAL SUPPORT; and TARGETING. []

ELECTRONIC WARFARE REPROGRAMMABLE LIBRARY (EWRL) - A machine-retrievable EW database used by reprogrammable EW systems. [] NOTE: The mission of the U.S. Navy EWRL Support Program is "to produce, manage, and maintain tactical electronic warfare reprogrammable libraries for automated EW systems to ensure that operational forces can employ full capabilities of reprogrammable EW systems".

ELECTRONIC WARFARE REQUIRED OPERATIONAL CAPABILITY (EW ROC) - Qualitative and quantitative system performance parameters, proposed by the user, and approved by the DON, that are primary indicators of a system's capability to accomplish its mission (operational effectiveness) and to be supported (operational suitability). [10:SECNAVINST 5000.2]

ELECTRONIC WARFARE REQUIRED OPERATIONAL FUNCTION (EW ROF) - A mission-related function that a unit is required to perform in the face of a postulated threat at a specified level of conflict. []

ELECTRONIC WARFARE STRATEGY - The art and science of developing and using Electronic Warfare as necessary during peace and war, to afford the maximum support to policies, in order to enhance friendly usage of and impede the adversary's

usage of the ELECTROMAGNETIC SPECTRUM. [Patterned after the definition of "Strategy" in reference 1]

ELECTRONIC WARFARE SUPPORT (ES or EWS) - (1) (ES) That division of electronic warfare involving actions tasked by, or under direct control of, an operational commander to search for, intercept, identify, and locate sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition. Thus, electronic warfare support provides information required for immediate decisions involving electronic warfare operations and other tactical actions such as threat avoidance, targeting, and homing. Electronic warfare support data can be used to produce SIGNALS INTELLIGENCE (SIGINT), both COMMUNICATIONS INTELLIGENCE (COMINT) and ELECTRONICS INTELLIGENCE (ELINT). [7:CJCS MOP 6, APPENDIX B] **(2)** Those collection actions tasked by, and under the direct control of, an operational commander, primarily geared toward tactical support of the joint commander. Formerly **ELECTRONIC SUPPORT MEASURES**. [10:2463]

ELECTRONIC WARFARE SUPPORT MEASURES (ESM) - That division of electronic warfare involving actions taken under direct control of an operational commander to search for, intercept, identify, and locate sources of radiated electromagnetic energy for the purpose of immediate threat recognition. Thus, electronic warfare support measures (ESM) provide a source of information required for immediate decisions involving Electronic Countermeasures (ECM), Electronic Counter-Countermeasures (ECCM), avoidance, targeting, and other tactical employment of forces. Electronic warfare support measures data can be used to produce signals intelligence (SIGINT), both communications intelligence (COMINT) and electronics intelligence (ELINT). Also called ESM. Increasingly replaced by **ELECTRONIC WARFARE SUPPORT**, sometimes called **ELECTRONIC SUPPORT MEASURES**. [1.1] See also **CRYPTOLOGIC ESM**, **FERRET RECEIVER**. **NOTE:** In Frequency Hopping, the total available bandwidth is the spread bandwidth; however, the instantaneous bandwidth is less than the spread bandwidth. This technique is used in communications, radar, jamming, and other applications.

ELECTRONIC WARFARE TOP LEVEL WARFARE REQUIREMENT (EW TLWR) - A statement of needed electronic warfare capability in the mid (10 year) and far (20 year) term to counter an anticipated threat in a particular spectral region. [] See also **ELECTRONIC WARFARE REQUIRED OPERATIONAL CAPABILITY**; **ELECTRONIC WARFARE REQUIRED OPERATIONAL FUNCTION**; **TOP LEVEL WARFARE REQUIREMENT**. **NOTE:** EW TLWRs contribute to EW system architectural design and system acquisition planning, and justify the timely allocation of resources to accomplish specific EW missions.

ELECTRONICS INTELLIGENCE (ELINT) - Technical and intelligence information derived from foreign non-communications electromagnetic radiation emanating from other than nuclear detonations or radioactive sources. [1.1] NOTE: ELINT is encompassed under SIGNALS INTELLIGENCE (SIGINT).

ELECTRONICS SECURITY (ELSEC) - The protection resulting from all measures designed to deny unauthorized persons information of value that might be derived from their interception and study of non-communications electromagnetic radiation, e.g., radar. [1.1]

ELECTRO-OPTIC (EO) - The portion of the ELECTROMAGNETIC SPECTRUM that ranges from ULTRAVIOLET through EXTREME INFRARED. [10:27] The ELECTRO-OPTIC spectrum is subdivided into the following bands:

ELECTRO-OPTIC SPECTRUM	
ULTRAVIOLET	0.01 - 0.4 microns
VISIBLE LIGHT	0.4 - 0.75 microns
NEAR INFRARED	0.75 - 3.00 microns
MID INFRARED	3.00 - 6.00 microns
FAR INFRARED	6.00 - 15.00 microns
EXTREME INFRARED	15.00 - 1,000.00 microns

. [11.2]

ELECTRO-OPTICAL INTELLIGENCE (ELECTRO-OPTINT) - Intelligence information, other than signals intelligence, derived from the optical monitoring of the electromagnetic spectrum from ultraviolet (0.01 micrometers) through far infrared (1,000 micrometers). [1.1] NOTES: (1) ELECTRO-OPTINT is a component of MEASUREMENT AND SIGNATURE INTELLIGENCE (MASINT). (2) ELECTRO-OPTINT encompasses INFRARED INTELLIGENCE (IRINT).

ELECTRO-OPTIC PAINTING - The covering of a surface with light-wave absorbing, reflecting, or otherwise optically confusing material. An example is camouflage painting. [] See also BACKGROUND MATCHING, ELECTROLUMINESCENCE, RADAR CAMOUFLAGE and YEHUDI.

ELECTRO-OPTIC TEXTILE - Textile material in which fiber optics and wires are integrated. [10:2953] See also **NANOTECHNOLOGY-ENHANCED CLOTHING, OBJECTIVE FORCE WARRIOR (OFW)**. NOTE: An example of a use for electro-optic textile is a multifrequency antenna vest that would eliminate the need to carry a bulky antenna kit. The antenna would provide coverage in the 30 - 500 MHz and 300 - 1000 MHz ranges using an ultrawideband antenna with no visible signature.

ELECTRO-OPTICS - The technology associated with those components, devices and systems which are designed to interact between the electromagnetic (optical) and the electric (electronic) state. Examples: Television; fiber optics. [1.1] See also **KERR EFFECT**. [11.2]

ELECTROPHONIC EFFECT - A buzzing or clicking sound in the back of the head experienced by a person subjected to pulsed microwave radiation, such as from a **SKULL TO VOICE (V2K) DEVICE**. The absorbed energy produces a thermoelastic expansion of the brain tissue causing an acoustic pressure wave which is detected by the hair cells of the organ of Corti (a spiral structure within the cochlea containing hair cells that are stimulated by sound vibrations. The hair cells convert the vibrations into nerve impulses that are transmitted to the brain.). [10:2797]

ELECTRO-TEXTILES - Integration of computers and electronics with textiles for Future Warrior (FFW) Systems. [] See also **ELECTRO-OPTIC TEXTILE**.

ELECTROTHERMAL GUN - A gun which uses electric energy and liquid propellant to achieve very high projectile velocities. [10:64]

ELIPTON - See **MRX**.

EMBEDDED AVIONICS - Avionic sensors and processors, covering the electromagnetic spectrum, within the skin of an aircraft. Also known as **SMART SKIN**. [10:96]

EMERALD - Acronym for *Event Monitoring Enabling Responses to Anomalous Live Disturbances*. EMERALD is a cyberdefense tool designed to detect computer HACKERS and other intruders. Because it is "anomaly-based", EMERALD is able to detect novel attacks to which no computer system has ever been exposed before. [10:2842] NOTE: While EMERALD is able to detect attacks, it is not designed to respond to them.

EMERGENCY ROCKET COMMUNICATIONS SYSTEM (ERCS) - A 1960s-era system to provide emergency UHF communications by launching a rocket that would

transmit pre-recorded force messages to all units within line of sight of the carrying rocket's apogee flight. [] NOTE: The ERCS was inactivated in the 1990s.

EMERGENCY WAR ORDER (EWO) - An order, issued by the President of the United States (POTUS), Secretary of Defense (SECDEF), or some other authorized command authority which initiates the employment of US nuclear weapon resources. []

EMISSION CONTROL (EMCON) - The selective and controlled use of electromagnetic, acoustic, or other emitters to optimize command and control capabilities while minimizing, for operations security (OPSEC), detection by enemy sensors; to minimize mutual interference among friendly systems; and/or to execute a military deception plan. See also RADAR SILENCE, RADIO SILENCE. [1.1]

EMISSION SECURITY (EMSEC) - Protection that results from all measures designed to deny unauthorized persons information of value that might be derived from intercept and analysis of compromising emanations. []

EMISSIVE CHAFF - CHAFF that also emits infrared (IR) radiation to deceive both RF and IR sensors on weapons. [8]

EMP HARDENING - Measures taken to reduce the effects of ELECTROMAGNETIC PULSE on equipment and systems. []

EMP/T BOMB - See HIGH ENERGY RADIO FREQUENCY (HERF)

EMPENNAGE - The tail assembly of an aircraft (*i.e.*, horizontal and vertical stabilizers, elevators, and rudder).

ENCOMPASS - See ENHANCED CONSEQUENCE MANAGEMENT PLANNING AND SUPPORT SYSTEM.

END GAME - The period of military engagement 3-5 seconds before missile impact. [10:2536] Also called ENDGAME.

ENABLER - Any sector of logistics that will help achieve a new or enhanced capability. [10:2998] NOTE: These sectors include materiel, automation, communications, business changes, and organizational redesigns.

ENDFIRE Relates to a technology that permits an antenna to emit a radar signal parallel to the plane of its surface, rather than the usual signal perpendicular to its surface. [10:3089]

ENDGAME COUNTERMEASURES (EGCM) - The detection of IR missiles launched at the host aircraft and automatic deployment of flares to decoy them. [10:2536] NOTE: Examples of endgame countermeasures include FORWARD-BIAS COUNTERMEASURES and the FLY-ALONG FLARE.

ENERGETIC ARMOR - See REACTIVE ARMOR.

ENERGETIC MATERIALS - A collective term for military high explosives, propellants and pyrotechnics that can sustain a steady state burning rate. [12] Synonymous with MILITARY EXPLOSIVES.

ENERGY HARVESTING - The extraction and storage of electrical energy from ambient sources such as solar wind, thermal sources (*e.g.*, ground-air and water-air interfaces), wave action, chemical gradients (*e.g.*, in ocean sediments), water currents (*e.g.*, deep ocean, stream, river), and human activities such as heel strike and back-pack motions. Also, the extraction and employment of naturally occurring fuels (*e.g.*, cellulose and sugars) as a source of hydrogen for small fuel cells. [10:2955] NOTE: Energy harvesting will extract energy from the environment to provide enhanced endurance for soldiers or robotic vehicles and indefinite power for "place and forget" sensors. See also CONTINUOUS ASSISTED PERFORMANCE (CAP), PERSISTENCE IN COMBAT (PIC), WATER HARVESTING.

ENERGY-MANEUVERABILITY DIAGRAM - A tool used by fighter pilots to analyze an aircraft's performance. The diagram shows a plane's turn and energy characteristics for a specific load and configuration. It shows the relationship between an airplane's current speed, G-load, turn rate and turn radius as well as revealing the changes in the airplane's energy state due to a maneuver. Also called E-M CHART. [10:2944]

ENGINEER AND MINE WARFARE (EMW) - A military operations mission area consisting of five major battlefield functions: mobility, countermobility, survivability, sustainment engineering, and topographic engineering. [10:2734]

ENHANCED CONSEQUENCE MANAGEMENT PLANNING AND SUPPORT SYSTEM (ENCOMPASS) - A suite of integrated software for collection and distribution among multiple points in near REAL TIME dynamic data relating to medical surveillance and disaster or crisis events. ENCOMPASS is comprised of the INCIDENT COMMAND MANAGEMENT SYSTEM (ICMS) and the DARPA SYNDROMIC SURVEILLANCE SYSTEM (D-S³). [10:2955]

ENHANCED FIBER OPTIC GUIDED MISSILE (EFOG-M) - A multi-purpose precision kill weapon system. It enables a gunner in defilade to engage and defeat

threat armored combat vehicles, other high value ground targets, and hovering or moving rotary wing aircraft that may be masked from line-of-sight direct fire weapon systems. [10:2744]

ENHANCED HYPERVELOCITY LAUNCHER (EHVL) - A 60-foot long multi-stage light gas gun that creates pressures of up to a million atmospheres. It has (reported in 1994) accelerated a 10 mm diameter titanium alloy flyer plate to 13.5 km/s (about 25 times the speed of a high-powered rifle bullet). []

ENGINE-DISABLING DEVICE - (1) A NONLETHAL WEAPON for disabling an engine such as that of a fleeing car by means of a high voltage discharge that perturbs or destroys the electrical circuits. (2) A NONLETHAL WEAPON consisting of airborne agents to choke engines or cause them to stall out. []

ENTANGLEMENT - See QUANTUM IMAGING.

ENTANGLEMENT MUNITIONS - NONLETHAL WEAPON munitions designed to disable propellers, rotor-blades, axles, etc.... [10:2648]

ENTANGLEMENTS - NONLETHAL WEAPON anti-personnel devices consisting of submunitions which release wire intended to entangle target individuals, or sticky nets intended to entangle fleeing individuals. []

ENTROPY - In communications, a measure of communications system efficiency; that is, entropy is a measure of the random errors (noise) occurring in the transmission of signals, and from this a measure of the efficiency of transmission systems. [*MSN Encarta Dictionary*] NOTE: The basic concept of entropy in information theory has to do with how much randomness is in a signal or in a random event. An alternative way to look at this is to talk about how much information is carried by the signal.

ENVIS - See EVADER'S NIGHT VISION IMAGING SYSTEM

ERASING - See C3I ERASING.

ERIEYE - A Swedish-developed Airborne Early Warning & Control (AEW&C) Doppler-based radar capable of detecting fast-moving targets against surface backgrounds. It can track more than 200 tracks simultaneously, and can discriminate individual aircraft in a multiple-aircraft target track. [Ericsson Erieye announcement]

ERLANG - A unit of communications link traffic intensity equivalent to the fraction of time that the link is occupied. []

ERROR BUDGET - The accounting for all elements which contribute to error in, say, emitter locating, to achieve location accuracy. [10:2983]

ERROR CONTROL CODE - See ERROR CORRECTING CODE.

ERROR CORRECTING CODE (ECC) - A Code in which each data signal conforms to specific rules of construction so that departures from this construction in the received signals can be automatically detected, and permits automatic correction, at the received terminal, of some or all of the errors. [3]

ESCORT JAMMING - See STANDOFF JAMMING.

ESCROWED ENCRYPTION - An encryption strategy wherein a third party is appointed by the state to keep a copy of the decryption keys, *i.e.*, in escrow, for the state to use to decrypt any file sent to or by any user. [10:2815]

ESM INTERCEPT RANGE - A range roughly equal to one-and-a-half times the theoretical radar range. [] NOTE: This is a rule of thumb. Actual intercept range is affected by many factors, including propagation anomalies, transmission paths, background noise, etc.

ETHERNET - A passive baseband (digital transmission of data up to 10 million bits per second) local area network (LAN). [] NOTE: Ethernet conforms to IEEE 802.3 Standard for Carrier Sense Multiple Access with Collision Detect (CSMA/CD).

EVADER'S NIGHT VISION IMAGING SYSTEM (ENVIS) - A portable night vision imaging system carried in the pocket of a survival vest. [*From a Night Vision Equipment Company product description*]

EVASIVE MANEUVERS BMD COUNTERMEASURES - A high-altitude countermeasure to make it difficult for the defender's missile to hit the part of the target that actually contains the warhead. A small rocket motor on the assembly containing the warhead starts the entire assembly tumbling. Another tactic is to deploy inflated balloons to make the entire tumbling assembly appear to be longer to the homing interceptor. Additional tethered balloons would present a complex target to the interceptor, making it impossible to determine the location of the warhead. [10:2609] See also FALSE-TARGET BMD COUNTERMEASURES, SHROUDING BMD COUNTERMEASURES, SUBMUNITION BMD COUNTERMEASURES, TRAJECTORY BMD COUNTERMEASURES.

EVIDENCE EXTRACTION AND LINK DISCOVERY (EELD) - A Defense Advanced Research Project Agency (DARPA) Total Information Awareness (TIA) program to develop technologies and tools for automated discovery, extraction and

linking of sparse evidence contained in large amounts of classified and unclassified data sources. [10:2969]. NOTE: EELD is a suite of technologies that will automatically extract evidence about terrorist threat-indicative relationships between people, organizations, places, and things from unstructured textual data, such as intelligence messages or news reports. [Source: DARPA]

EVOLUTIONARY COMPUTING (EC) - An approach to computing which is based on analogues of natural selection. EC may employ GENETIC ALGORITHMS, genetic programming, evolutionary strategies, and artificial life. [10:2783]

ELECTRONIC CARD WALL (EWALL) - An automated team decision-making tool that can reduce the practice of writing ideas and information on notes to be pasted to a board for other team members to view. With EWALL, the team members input their thoughts (using a keyboard, for example) and a software algorithm arranges and prioritized them. Consequently, patterns of common thought threads emerge while atypical ideas fade into the background. [10:3055] NOTE: Because EWALL is Web-based, team members can query for the latest information on a specific topic.

EXABYTE - 2^{60} or 2 to the 60th power (1,152,921,504,606,846,976) bytes. An exabyte is equal to 1,024 PETABYTES. ALSO CALLED "exbibyte." NOTE: In 1999, the International Electrotechnical Commission (IEC) introduced the "base 2" prefixes kibi-, mebi-, gibi-, tebi-, pebi-, exbi-, to describe numbers, such as those for indicating computer disc capacities.. The names come from the first two letters of the original SI (International System of Units) prefixes to which is appended *bi* ("binary").[]

EXCIMER LASER - A laser designed to damage targets either by thermal kill, or through impact of high energy photons. [5:1] See also CHEMICAL LASER; FREE-ELECTRON LASER; X-RAY LASER; HIGH-ENERGY LASER.

EXFILTRATION ROCKET (ER) - A system which quickly extracts special operations forces (SOF) teams from the mission area. [USAF 2025 study]

EXPANDED MEMORY - Additional RANDOM ACCESS MEMORY (RAM) which is swapped in and out of the 1Mb memory address of an 8088-class (i.e., original PC) computer through the use of special boards and software called *expanded memory managers* (EMM) which create the effect of having up to 32 Mb of memory. [] Compare with EXTENDED MEMORY.

EXPEDITIONARY UNDERWATER SENSOR SYSTEM (EUSS) - A mobile SOUND SURVEILLANCE SYSTEM (SOSUS) intended for use at the flanks of littoral areas. [10:2873]

EXPENDABLE ACOUSTIC REMOTE SENSOR (EARS) - A gun-emplaced passive acoustic sensor which autonomously detects and classifies vehicles by their acoustic signature and reports the results via telemetry. [10:2731]

EXPERT SYSTEM (ES) - (1) A computer program that embodies the expertise of one or more experts in some domain and applies this knowledge to make useful inferences for the user of the system. [10:10] (2) A program that solves problems competently at an expert level in a particular domain. The system uses a knowledge base, which is separate from the part of the program that does the inferencing using the knowledge base. An expert system is capable of dealing with incomplete knowledge and is able to explain its reasoning and conclusions. Synonymous with **KNOWLEDGE-BASED SYSTEM**. NOTE: One feature of expert systems that distinguishes them from conventional computer programs is that of the "explanation facility" which provides easy access by the user to the chain of reasoning that produced a given result (i.e., the user can ask "Why?" at any point).

EXPLOSIVE FLUX COMPRESSION GENERATOR (FCG)- See **EXPLOSIVE MAGNETIC FLUX COMPRESSOR**.

EXPLOSIVE MAGNETIC FLUX COMPRESSOR - A device in which energy from a capacitor charges an inductor, which is then compressed rapidly by detonating an explosive. To conserve magnetic flux in the inductor, the inductor current increases as its area and inductance decreases. The result is a large pulse of current that can be employed in **DIRECTED ENERGY WEAPONS**. [10:16] Also called **EXPLOSIVE FLUX COMPRESSION GENERATOR**, **EXPLOSIVELY PUMPED FLUX COMPRESSION GENERATOR (EPFCG)**. NOTES: (1) With delivered power levels of terawatts or tens of terawatts, a large flux generator can produce electrical currents which are three orders of magnitude greater than those produced by a typical lightning stroke. [10:2824] (2) A military advantage of the explosive magnetic flux compressor is that an **ELECTROMAGNETIC PULSE (EMP)** can be generated without use of a nuclear device.

EXPLOSIVE SPLICING - A process of splicing wires by enclosing and metallurgically bonding the wires within copper sheets through use of explosive ribbons. [10:101] NOTE: This process is especially useful for joining small diameter conductor wires with results superior to solder joints. Explosively-spliced wires display stability at high temperature, and show no susceptibility to corrosion in contacts between dissimilar metals.

EXPLOSIVE STANDOFF MINE CLEARER (ESMC) - An explosive counter-mine system that creates a vehicle-wide lane by explosively neutralizing all surface and buried anti-tank (AT) mines from a position outside their lethal radii. The ESMC consists of a rocket-propelled explosive neutralization system (ENS) with shaped-charge munitions embedded in an oblong net. See also **EXPLOSIVE STAND-OFF**

MINEFIELD BREACHER. [] NOTE: The ESMC attacks the explosive components of the mines, not their firing mechanisms.

EXPLOSIVE STAND-OFF MINEFIELD BREACHER (ESMB) - An explosive system designed for in-stride clearing of mine fields in the path of an advancing tank force. The system consists of a mesh webbing, 5 meters wide and 145 meters long, containing more than 25,000 closely-spaced shaped explosive charges. The web is rocket-launched onto a suspected mine field ahead of an advancing tank column. Mines are destroyed by plasma jets produced by the detonation of the shaped charges. [10:2702]

EXPLOSIVELY PUMPED FLUX COMPRESSION GENERATOR (EPFCG) - See **EXPLOSIVE MAGNETIC FLUX COMPRESSOR.**

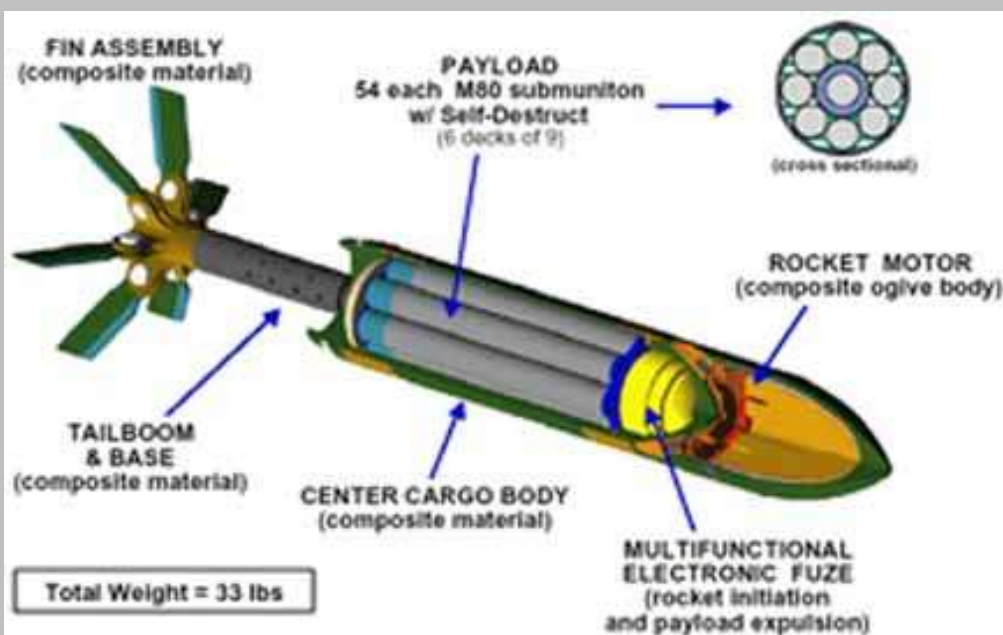
EXTENDED HYPERTEXT MARKUP LANGUAGE (XHMTL) - An extension of HTML that makes it compatible with the **EXTENSIBLE MARKUP LANGUAGE (XML).** []

EXTENDED MEMORY - RANDOM ACCESS MEMORY (RAM) that can be addressed by 8026-class (AT) and 8036-class computers. [] Compare with **EXPANDED MEMORY.**

EXTENDED RANGE GUIDED MUNITION (ERGM) - A rocket-assisted, boost/glide trajectory projectile that can be fired from a naval gun to a range exceeding 50 nautical miles. The 110 lb. ERGM consists of three basic subsystems: the navigation and control electronic subsystem; the unitary blast/fragmentation warhead; and the rocket motor. Once launched, the ERGM stabilizes as its six tail fins deploy. The rocket motor ignites, propelling the round to a maximum altitude of 80,000 feet. Four canards then deploy providing the primary control surfaces. Employing a combined GPS and inertial navigation system, the ERGM glides to the target, arriving nearly vertically to maximize the effectiveness of its warhead. The ERGM accuracy is within 4 meters. [10:3019]

EXTENDED RANGE MORTAR CARTRIDGE (ERMC) - A rocket-assisted mortar projectile with an effective range of more than 12 km. It contains a 4-second nose-mounted rocket motor that cuts in at a predetermined point during the bomb's trajectory about 12 seconds after launch. The ERMC releases 54 M80 mortar grenades, or a variety of other payloads including anti-personnel / anti-material (APAM) submunitions. [Source: www.military.com, July 17, 2004]

XM984 EXTENDED RANGE MORTAR CARTRIDGE



Source: www.military.com, July 17, 2004

EXTENSIBLE MARKUP LANGUAGE (XML) -- A data format that facilitates defining types of documents, authors and manages documents for sharing over the Web. It is a simplified version of the **STANDARD GENERALIZED MARKUP LANGUAGE**. [] See also **DYNAMIC HYPERTEXT MARKUP LANGUAGE**, **HYPERTEXT MARKUP LANGUAGE**, **JAVA**.

EXTRANET - A private network that uses the **INTERNET PROTOCOL** and the public telecommunication system to securely share part of the using business's information or operations with suppliers, vendors, partners, customers, or other businesses. It is a Web site developed for customers, rather than the general public, providing access to research, current inventories and internal databases, and virtually any other private or proprietary information. [Computer Desktop Encyclopedia. Computer Language Company, Inc., 2003] **NOTE**: An extranet uses the public Internet as its transmission system, but requires passwords to gain entrance. Access to the site may be free or require payment for some or all of the services offered. The extranet can be viewed as part of a company's **INTRANET** that is extended to users outside the company. It has also been described as a "state of mind" in which the Internet is perceived as a way to do business with other companies as well as to sell products to customers. Because of the need for security and privacy, extranets employ **FIREWALLS**, server management, digital certificates, user

authentication, encryption of messages, and VIRTUAL PRIVATE NETWORKS (VPN) are employed.

EXTRAORDINARY MAGNETORESISTANCE (EMR) - A physics effect manifested by a huge change in the resistance to the flow of current in certain nonmagnetic hybrid materials when they are subjected to magnetic fields. [10:2977] See also **GIANT MAGNETORESISTANCE (GMR)**.

EXTREME INFRARED - The portion of the infrared spectrum band between 15 and 1,000 microns. [10:27] See also **ELECTRO-OPTIC, INFRARED, NEAR INFRARED, MID INFRARED, FAR INFRARED**.

EXTREMELY LOW FREQUENCY (ELF) - A communications system for transmitting short messages from operating authorities in the Continental United States (CONUS) at extremely low frequencies to submerged submarines which are at operating depths and speeds. [SPAWAR] See also **FIXED VERY LOW FREQUENCY (FVLF)** NOTE: ELF operates in the 40 - 80 Hz region using antennas between 45 and more than 200 km in length. It employs the phenomenon of ionospheric refraction.

EYE-SAFE - Pertains to laser devices such as laser rangefinders. If human eyes are inadvertently lased by the device, there is no risk of retinal damage. See also **LOW ENERGY LASER WEAPON**. []
