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Researched and compiled by Joe Cyr (www.joe-cyr.com)

NANCY HANKS - A voice radio code word alerting the recipient(s) that signals via INFRARED light are about to be sent. [] NOTE: This normally occurs for communications among ships in formation within visual distance or among ships in a port.

NANO AIR VEHICLE (NAV) - A three-inch flapping-wing BIOMIMETICS air vehicle weighing about ten grams that can carry a 2-gram payload. [10:3102] NOTE: This is a DARPA project (*ca* 2008) to develop a small unmanned aerial system that can operate both indoors and out, giving troops and first responders the capability to conduct reconnaissance missions in urban environments.

NANOBOT - A molecular-size robot, such as that being developed for use in medical inoculations. []

NANOCABLE – A coaxial cable, 100 nanometers in diameter, composed of a micro-thin copper wire coated with jackets of copper oxide and a one-atom thick jacket of carbon graphene. [10:3124 *SIGNAL*, August 2012] NOTE: The nanocable can store electrical energy up to 143 microfarads per centimeter squared – ten times more energy than possible in currently available microcapacitors.

NANOCANTILEVER - A tiny silicon structure, resembling a diving board, with potential for a new class (*ca* 2006) of ultra-small sensors for detecting viruses, bacteria, and other pathogens. The "nanomechanical" sensor is coated with proteins, including antibodies, which attract the contaminant. Presence of contaminants affects the frequency of vibration of the structure, and is thus detectable. [from a report in the *Purdue Electrical & Computer Engineering Impact*, Winter 2006-2007]

NANOELECTRONICS - Integrated circuit devices having dimensions into the submicron (less than 10K Angstrom) regions. []

NANO HUMMINGBIRD - A NANO AIR VEHICLE (NAV) shaped to have the appearance of a real hummingbird. The prototype aircraft has a wingspan of 6.5 inches and a total flying weight, including all systems needed for flight, as well a communications systems and a video camera, of less than an ounce. The Nano Hummingbird can climb and descent vertically, fly sideways left and right, fly forward and backward, and rotate via remote control, all while carrying its video camera payload. It can fly at speeds up to 11 miles per hour. [11:3110]

Nano Hummingbird

NANOISLAND – An experimental (2007) data storage material consisting of 100-atom iron clusters which take up only one six-hundredth the area of magnetic bits on a typical hard disk. NOTE: The new method is still experimental; the data bits created are temporary, and the nanoislands must be cooled below the temperature of liquid nitrogen. [10:3093]

NANOMETER - One billionth of a meter (about one fifty-thousandth the diameter of a human hair) []

NANOPHASE MATERIAL - Material used in devices with dimensionality in the order of nanometers (10^{-9} meter). []

NANORESONATOR – A nano-scale resonator consisting of a tiny silicon beam (fastened on its ends) that vibrates when voltage is applied, forming a precise filter. One application is to help cell phone users avoid dropped calls and slow downloads. [10:3120 – *Purdue Alumnus*, Nov/Dec 2012]

NANOSATELLITE (NANOSAT) - A small, relatively inexpensive satellite, so-called because of its ability to maintain position relative to another satellite within nanometer tolerance. In one configuration, the NANOSAT is octagonal-shaped measuring 16 inches across and 8 inches in height. [10:2788] NOTE: Various agencies are funding (1999) a collaboration of universities and other agencies in the development of nanosatellite projects.

NANOSCIENCE - The study of the performance of structures, materials, and devices with ultra-small -- but controllable -- features in the tens of angstroms range (nanoscale structures). [10:2592] See also BIOMIMETICS, SMART STRUCTURES. NOTE: Nanoscale structures can be constructed in two ways - ATOMIC-LEVEL MANUFACTURING and SELF-ASSEMBLY. [10:2834]

NANOSECOND - One billionth of a second. []

NANOTECHNOLOGY-ENHANCED CLOTHING - Military uniform clothing embedded with both hard (exterior) and soft (interior) body armors, and containing a variety of nanomaterials that will aid threat detection and neutralization, enhance human performance, provide REAL-TIME automated medical treatment and reduce

logistical footprint on the battlefield. [10:2947] Also called BATTLE SUIT. See also ELECTRO-OPTIC TEXTILE, OBJECTIVE FORCE WARRIOR (OFW). NOTE: Many features are envisioned (2002) for the battle suit: Sensors placed a key areas of the battle suit could indicate soldier's status -- whether they are awake, timed or injured -- and monitor physiological conditions such as blood pressure, pulse and temperature. If a soldier has been injured, a system would communicate where and how badly. Additionally, the soft suit would be designed to become rigid in the appropriate area to act as a splint for a broken bone. The battle suit would also have an exoskeleton which could make a wearer's muscles more effective, allowing longer leaps, etc...

NANOTRANSISTOR - A transistor measuring only 60 nanometers, or about 16 times thinner than a human hair. One of its key characteristics is a layer of insulation between a gate and a source and drain that measures only 1.2 nanometers thick -- the equivalent of three atoms. [10:2618]

NANOTUBE - See BUCKY TUBE

NANOWIRE - (1) NANOMETER-scale rods made of semiconducting materials. [10:2893] (2) A wire or rod made of one or more semiconductors, such as gallium arsenide or indium phosphide. [10:3058] NOTE: One application (2001) is the room-temperature nanowire ultraviolet laser. See also BUCKMINSTERFULLERENES, BUCKY TUBE, DENDRIMERS, FULLERENE, MOLECULAR ELECTRONICS, QUANTUM DOTS.

NAP-OF-THE-EARTH FLIGHT - See TERRAIN FLIGHT.

NARROWBAND INTERLEAVED SEARCH AND TRACK (NBILST) - An aircraft radar mode in which the radar is used only to provide precise range and velocity data to set up a missile attack. [10:2836]

NARROWBAND JAMMING - Jamming where the jammer's entire power output is concentrated in a very narrow bandwidth, ideally identical to that of the victim radar. Two RF carriers are transmitted with a few hertz difference. [4:1] Synonymous with SPOT NOISE JAMMING.

NARROWBAND NOISE - In acoustics, the tonal sounds generally produced by machinery in well-defined and narrow frequency bands useful for both detection and identification. Contrast with BROADBAND NOISE. [10:126]

NAVAL EXPEDITIONARY OVERWATCH (NEO) - A system that includes a 38-foot unmanned surface vehicle equipped with a Gunslinger, sensors and communications systems for providing intelligence, surveillance and reconnaissance support to commanders. [10:3115]

NAVAL SPACE SURVEILLANCE SYSTEM (NAVSPASUR) - See SPASUR.

NAVIGATION COUNTERMEASURES (NAVCM) - The detection and evaluation of enemy electronic aids to navigation, and the use of jamming and deception to interfere with enemy use of such aids. []

NAVIGATION WARFARE (NAVWAR) - A subset of ELECTRONIC WARFARE (EW), NAVWAR is an environment in which

- friendly forces maintain their ability to use satellite navigation;
- satellite navigation is denied to hostile users; and
- there is no effect upon civilian applications.

[10:2598] See also GLOBAL POSITIONING SYSTEM (GPS).

NAVY FIRES NETWORK (NFN) - A Strike Warfare (STW) Command and Control (C^2) architecture for the Navy to provide quick targeting and strike capability. It is related to the Army's TACTICAL EXPLOITATION SYSTEM (TES) and the Navy's Littoral Surveillance System (LSS). []

NAVY MULTIBAND TERMINAL (NMT) - A satellite communications terminal whose antenna is designed to remain locked on a satellite, even in heavy seas (35-degree roll). NOTE: Designed for extreme reliability, the NMT will be able to operate for 4,400 hours without failure. [10:3045]

NAVY-WIDE INTRANET (NWI) - A secure digital-communication network internal to the Navy. [10:2664] See also NETWORK-CENTRIC WARFARE (NCW)

NEAR INFRARED - The portion of the infrared spectrum band between 0.75 and 3.00 microns. [10:27] See also ELECTRO-OPTIC, MID INFRARED, FAR INFRARED, EXTREME INFRARED. NOTE: Near infrared sensors can detect hot engine parts. [10:2547]

NEAR REAL TIME (NRT) - Delay caused by automated processing and display between the occurrence of an event and the reception of the data at some other location. [1.1] See also REAL TIME.

NEARSAT -- See SPACE MINE

NEAR SPACE - Altitudes between 18 and 23 miles. [10:3033]

NEAR-TERM MINE RECONNAISSANCE SYSTEM (NMRS) - A covert mine-detection system that ranges from deep water (DW) to shallow water (SW). NMRS

consists of an UNMANNED UNDERWATER VEHICLE (UUV) about the size of a Mk 48 torpedo. NRMS is launched from a 688-class submarine's torpedo tube but remain tethered to the submarine via a fiber-optic link, which can extend out several miles. Using an onboard inertial unit to navigate, the NRMS uses a multibeam, forward-looking active sonar to detect moored and bottom objects and a side-scanning HF sonar to classify them. Data are relayed to an operator console in the submarine. See also LITTORAL REMOTE SENSING (LRS). See also LONG-TERM MINE RECONNAISSANCE SYSTEM (LMRS).

NEGATIVE CONTRAST - Detection of the absence of light, such as what is observed when looking at an eclipse of the sun. []

NEMESIS - See NEW MILLENNIUM ELECTRONIC SURVEILLANCE INTERFACE SUITE.

NETWORK - With respect to computers, a data communications system which interconnects computer systems at various sites. [10:2736]

NETWORK-BASED INTRUSION DETECTION - A type of INTRUSION DETECTION that examines network data to detect HACKERS. [10:2853] See also ACTIVE NETWORK INTRUSION DEFENSE (ANID), ANOMALY DETECTION, HOST-BASED INTRUSION DETECTION, PORT SCAN, SIGNATURE DETECTION.

NETWORK CENTRIC OPERATIONS (NCO) - A set of assets, balanced in their design and acquisition so as to be integrated with one another, operating together effectively as one complete system to accomplish a mission. The assets so assembled encompass naval force combat, support, and Command, Control, Communications, Computers, and Intelligence and Surveillance and Reconnaissance (C^4ISR) elements and subsystems, integrated into an operational and combat network. [10:2898]

NETWORK-CENTRIC WARFARE (NCW) - The linkage of existing sensors, command-and-control (C^2) systems, and weapon shooters. NCW incorporates three interrelated information-exchange grids: (1) the sensor grid; (2) the C^2 grid; and (3) the shooter grid. All three grids rapidly and reliably exchange sensor data, command decisions, and weapon allocations. The primary goal of NCW is to optimize the exchange of information and commands among these three grids. [10:2665] See also NAVY-WIDE INTRANET

NETWORK EARLY WARNING SYSTEM (NEWS) - An automated method for spotting early indicators of network-based attacks, and by correlating individual network security incidents, can help analysts determine if the site is under a large-

scale or coordinated attack. [10:2984] NOTE: NEWS cues the analyst to early signs of attack and can detect multisite attacks in their stages. By examining traffic data, NEWS can determine the intended targets of an attack (e.g., an attack signature containing a string such as "CMD.EXE" would indicate the the target is Microsoft Windows).

NETWORK WARFARE (NW) - The employment of computer network operations with the intent of denying adversaries the effective use of their own computes, information systems, and networks. [10:3091]

NEURAL BEAMFORMING - The achievement of direction finding by using NEURAL NETWORK techniques to have the antenna array "learn" the relationship between received antenna radiation and the location of the target emitting (or reflecting) the radiation. [10:2556]

NEURAL COMPUTER - A computational device designed or modified to mimic the behavior of a neuron or a collection of neurons. [12]

NEURAL NETWORK - Computer software intended to mimic the way humans learn and process information. [] NOTE: Neural networks do not use algorithms like conventional software, nor do they use sets of IF-THEN rules as do expert systems. Instead, the neural network "learns" by using inputs and the proper corresponding outputs to develop its own mechanism for transforming input data into the correct solution. Neural networks have been used as adaptive filters to reduce interference and noise in voice and digital communications circuits.

NEUROBOTICS - The fusion of neuroscience and robotics for augmenting human capabilities. [10:3068]

NEURO-ELECTROMAGNETIC DEVICE - A NONLETHAL WEAPON which uses radio signals specifically modulated to directly affect the brain and nervous system from a distance. [] See also VOICE TO SKULL (V2S) DEVICE. Compare with SILENT SOUND DEVICE.

NEUTRAL PARTICLE BEAM (NPB) - A DIRECTED ENERGY WEAPON (DEW) under DoD's WEAPONS SYSTEMS TECHNOLOGIES (WST). The generation, propogation and control of high intensity atomic beams of hydrogen or its isotopes. [*www.dtic.mil*] NOTE: NPBs can produce a range of lethality from SOFT KILL to HARD KILL. See also ANTIMATTER PARTICLE BEAM (APB), CHARGED PARTICLE BEAM (CPB), GAMMA-RAY LASER (GRASER), HIGH POWER MICROWAVE/RADIO FREQUENCY (HPM/RF), and KINETIC ENERGY WEAPON (KEW).

NEUTRALIZE - As pertains to military operations, to render ineffective or unusable. [1.1] See also EFFECTIVE DAMAGE.

NEW MILLENNIUM ELECTRONIC SURVEILLANCE INTERFACE SUITE (NEMESIS) - An Airborne Early Warning (AEW) workstation intended (1999) to implement the latest Human-Machine Interface (HMI) technology available, including advanced displays, voice control, and new track management tools that will free the Naval Flight Officer (NFO) from numerous system operations tasks, allowing that person to focus on tactical decision making. []

NIGHT EFFECT - An effect mainly caused by variations in the state of polarization of reflected waves, which sometimes result in errors in direction finding bearings. The effect is most frequent at nightfall. [1.1]

NIGHT TARGETING SYSTEM (NTS) - A helicopter system which provides aircrews with highly stabilized, sharp target images through the use of sophisticated sighting and tracking sensors and a second-generation FORWARD LOOKING INFRARED (FLIR) sight. [10:2786] NOTE: The NTS-A (advanced NTS) is installed (2000) on Israeli A129 multi-mission helicopters.

NIGHT VISION (NV) - See LIGHT AMPLIFICATION.

NIXIE TUBE - (1) A COLD CATHODE electron tube containing a little neon gas in a glass envelope. The CATHODEs are shaped into numerals, lined up one behind the other, (there is a single anode). Voltage applied to the appropriate pins ionizes the surrounding neon, causing the associated cathode (numeral) to glow. [11.7] (2) A set of DIODEs in a glass tube containing a little neon gas. The CATHODEs are shaped into numerals, lined up one behind the other. Voltage applied to the appropriate pins ionizes the surrounding neon, and the numeral seems to glow. [10:2939] NOTE: "Nixie" is a nickname term for the original appellation of the tube, *i.e.*, "NIX-1," Numeric Indicator Experimental-1.

NODDING IDIOT - A term referring to height-finding radar antennas which oscillate (or "nod") to permit the radar to gather height information. [] NOTE: The height-finding function is achieved without nodding-antenna motion in some height-finding and PHASED-ARRAY ANTENNAS which employ LOBE-SWITCHING techniques.

NOISE - An undesired disturbance within the useful frequency band. Contrast with SIGNAL. [3] See also IMPULSE NOISE, RANDOM NOISE, WHITE NOISE.

NOISE FLOOR - A continuous NOISE JAMMING signal that is simultaneously radiated with the principal ECM signal being employed, and of considerably less power. [8]

NOISE ILLUMINATED CHAFF - See JAFF.

NOISE JAMMING - The transmission of a NOISE-like signal in the target system's radar receiver bandpass. [8] NOTE: At low power levels, noise jamming has the characteristics of receiver noise and can be mistaken by the radar operator as a problem with the radar. [] The object of noise jamming is to introduce a disturbing signal into the hostile electronic equipment so that the actual signal is obscured by the interference. The victim of this disturbance might be a radar receiver, a communications network or a data link. [10:2563] See also BARRAGE JAMMING, SPOT JAMMING, SPOT NOISE JAMMING.

NOISE RADAR - A RADAR that transmits a random electromagnetic signal with a very wide bandwidth (*e.g.*, several GHz). The received signal is cross-correlated with a delayed copy of the transmitted signal to yield the target information. []

NOMEX® - A fiber created by DUPONT with an extraordinary combination of high-performance heat- and flame-resistant properties, as well as superior textile characteristics. [*DUPONT*] See BALACLAVA

NOMINAL FILTER - A filter capable of cutting off a nominated minimum percentage by weight of solid particles greater than a stated micron size. [1.1]

NON COHERENT COMMUNICATIONS - Non-coherent communication links employ MODULATION precise reference generation in the receiver. As such, they perform well in channels experiencing FADING, blocking, or DOPPLER EFFECT. A coherent communication link, such as FREQUENCY SHIFT KEYING (FSK), requires a transmitter with a precise carrier frequency and a receiver with circuitry able to reproduce this frequency exactly. []

NON-COOPERATIVE TARGET IDENTIFICATION - Target identification that exploits an adversary's identification system. [] Contrast with COOPERATIVE TARGET IDENTIFICATION. See also INDIRECT TARGET IDENTIFICATION, TARGET IDENTIFICATION.

NONDESTRUCTIVE ELECTRONIC WARFARE - Those EW actions, not including employment of WARM, that deny, disrupt, or deceive rather than damage or destroy. [7:CJCS MOP 6, APPENDIX B]

NON-DEVELOPMENTAL ITEM (NDI) - A generic term describing either a commercial product or an item which has been developed and used by another service, country, or government agency. Use of NDI reduces R&D costs and speed up the acquisition process. [9] Synonymous with off-the-shelf item.

NON HULL-PENETRATING PERISCOPE (NPP) - A periscope in which thermal imaging data and very- high-resolution television data are carried to the interior of the

submarine or other platform via optical fibers, thus eliminating the necessity for hull penetration of the periscope. [10:106] See also MAST-MOUNTED SENSOR, REMOTELY OPERATED PLATFORM - ELECTRONIC, UNDERWATER VIEWING MODULE, UNMANNED UNDERWATER VEHICLE.

NON-LETHAL WEAPON - See NONLETHAL WEAPON.

NONLETHAL WEAPON (NLW) - (1) A warfare concept that emphasizes the preservation of human life and the environment by using advanced electromagnetic, chemical and kinematics technology to destroy and disable warfare systems. The concept includes the use of precision guidance systems to deliver nonlethal weapons through remote-detonation, REMOTELY PILOTED VEHICLES (RPVs), laser guidance and SOLDIER INTEGRATED PROTECTIVE ENSEMBLE (SIPE)-assisted fire-control and target lock-on. [10:2648] Synonymous with HUMANE WEAPON.

(2) The Department of Defense (DoD) defines non-lethal weapons as "weapon systems that are explicitly designed and primarily employed so as to incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment." [10:2733] Also called SUB-LETHAL WEAPON, NON LETHAL WEAPON, LESS-THAN-LETHAL WEAPON. See also LESS-THAN-LETHAL (LTL) MUNITIONS. NOTES: Non-lethal weapons are divided into two categories, each with a number of functional areas as follows: [10:2857] *(I)* Counter-personnel, with functional areas (1) Crowd control; (2) Incapacitation of personnel; (3) Area denial to personnel; and (4) Clearing facilities of personnel. *(II)* Counter material, with functional areas (1) Area denial to vehicles; and (2) Disabling vehicles.

The following table lists examples of nonlethal weapons:

NONLETHAL WEAPONS	
ACOUSTIC BULLETS	ACOUSTIC WEAPONS
ACTIVE DENIAL SYSTEM	AERIAL DIVERSIONARY DEVICE
AMIABILITY AGENTS	ANESTHETICS
ANTI-AIR LASERS	ANTI-MATERIEL CHEMICALS/BIOLOGICALS
ANTI-PERSONNEL ENTANGLEMENTS	ANTI-TRACTION LUBRICANTS
ANTI-PERSONNEL BEAM WEAPON (APBW)	BEAN BAG BATONS
BLINDING LASERS	BLUNT IMPACT MUNITIONS (e.g. SOFT RAG)
BOLOs	BOUNDING NON-LETHAL MUNITION (BNLM)
BURSTING OBSCURANT SMOKE GRENADES	CALMATIVE AGENTS
CARBON FILAMENT BOMB	COMBUSTION ALTERATION

COMBUSTION INTERFERENTS	CONFUSION WEAPONS
COVARC VEHICLE DEFENSE	CROWD-DISPERSAL ROUNDS
DEFERENCE TONES	DELAYED-ACTION AGENTS
DIFFERENCE ACOUSTIC WAVE GENERATION SYSTEM (DAWGS)	DIRECTED STICK RADIATOR (DSR)
DISORIENTATION DEVICES	DRY-ICE WEAPONS
ELECTRICAL STUN DEVICES	ENGINE-DISABLING DEVICES
ENTANGLEMENT MUNITIONS	FLAMELESS EXPULSION GRENADES
FRANGIBLE PROJECTILE	GLARE LASERS
HIGH POWERED ACOUSTIC WEAPONS	ILLUMINATOR GRENADES
INFRASOUND	LIQUID CONDUCTIVE THREAD PROJECTORS
METAL EMBRITTLEMENT	MILLIMETER-WAVE PROJECTOR
MODULAR CROWD CONTROL MUNITIONS (MCCM)	NEURO-ELECTROMAGNETIC DEVICE
NON-NUCLEAR ELECTROMAGNETIC PULSE (NN-EMP)	**ODOR BOMB**
OVERHEAD CHEMICAL AGENT DISPERSAL SYSTEM (OCADS)	PORTABLE ROADBLOCK
PORTABLE VEHICLE ARRESTING BARRIER (PVAB)	PORTABLE VEHICLE IMMOBILIZING SYSTEM (PVIS)
PULSE-WAVE® MYOTRON®	PUNCH GUN
RADIO FREQUENCY INCAPACITATING SYSTEMS	RING AIRFOIL GRENADE (RAG)
ROAD PATRIOT/SENTRY/STAR	RUBBER-BALL LAUNCHING SYSTEMS
RUNNING GEAR ENTANGLEMENT SYSTEM (RGES)	SET BEAM HIGH INTENSITY HAND-HELD SEARCHLIGHT
SILENT SOUND DEVICE	SKAT SHELL
SMOKELESS STUN GRENADE	SONIC BULLET
SPONGE GRENADE	STARFLASH STUN GRENADE
STICKY FOAM	STICKY SHOCKER®
STING NET	STINGBAG
STINGBALL STUN IMPACT GRENADE	STINGSHOT
STUN DISTRACTION DEVICE	SUPER CAUSTICS
TASER®	TEFLON CONFETTI
THERMAL GUNS	THUNDER ROD STUN GRENADES
THUNDERSTRIP STUN MUNITIONS	VARIABLE VELOCITY RIFLE SYSTEMS (VVRS)
VEHICLE ACTIVE DEFENSE SYSTEMS (VADS)	VEHICLE-DISABLING WEAPON (VDW)
VESSEL STOPPER SYSTEM (VSS)	VOICE SYNTHESIS DEVICES
VOICE TO SKULL (V2K) DEVICES	VORTEX WEAPONS

IMPORTANT NOTE: Despite the term "NONLETHAL WEAPON", such devices are capable of inflicting permanent injury and death, depending upon weapon settings, method of use, the circumstances, and the physical condition of the targeted individuals (TIs) at the time of use.

NON-NUCLEAR ELECTROMAGNETIC PULSE (NN-EMP) - A type of weapon used in NONLETHAL WARFARE which entails the use of explosively-driven NN-EMP generators, bombs, or satellites to destroy computer and communication systems, power systems, and semi-hardened electronic circuitry, including electronic triggers from space or air. [10:2648] See also ELECTROMAGNETIC PULSE.

NONSINUSOIDAL RADAR - See IMPULSE RADAR.

NONSPECIFIC JAMMING AND INTERFERENCE - [ACOUSTIC JAMMING term] The generation of high-intensity, broadband acoustic noise into the water to indiscriminately interfere with all underwater sensors within range. [10:41]

NON-VOLATILE MEMORY - See NON-VOLATILE RAM.

NON-VOLATILE RAM - RANDOM ACCESS MEMORY (RAM) which can retain information in the absence of power. An example is BUBBLE MEMORY. [] Contrast with VOLATILE RAM.

NORTH BRIDGE - A circuit in a computer chip which connects the central processing unit (CPU) to the system memory, accelerated graphics port (AGP) and peripheral connect interface BUSSES. [] Also called NORTHBRIDGE CHIP. Contrast with SOUTH BRIDGE.

NORTH SEEKING MODULE (NSM) - A system component which employs the GLOBAL POSITIONING SYSTEM (GPS) and selects an astronomical body, such as the sun, moon, or a star, as an azimuth reference, and delivers true North to the system. North seeking modules are employed in artillery, target acquisition systems, directional antennas, rocket launchers, etc. []

NUCLEAR ELECTROMAGNETIC PULSE (NEMP) - See ELECTROMAGNETIC PULSE (EMP).

NUCLEAR ELECTROMAGNETIC PULSE COUNTERMEASURES (NEMPCM) - Those measures taken to reduce or eliminate the effects of ELECTROMAGNETIC PULSEs (EMPs). These include SHIELDING, METAL OXIDE VARISTOR (MOV), high-speed ZENER DIODEs, waveguide beyond cutoff, spark-gap arrestors, filter networks, and fiber-optic circuitry. Although it provides some degree of protection from EMPs, shielding cannot be regarded as an effective countermeasure

by itself. Especially at high frequencies, where leakage can occur through even the smallest gaps. Drawbacks of using MOVs for EMP suppression include relatively slow response time and a tendency for performance to degrade with each overload. A typical filter network for surge protection is a configuration of capacitor-inductor-capacitor, called a "pi filter" because its schematic resembles the Greek letter *pi*. The pi filter has proven to be an effective countermeasure for threats such as ELECTROMAGNETIC INTERFERENCE (EMI) and low-level EMP. A high-speed Zener diode provides EMP suppression. Since the pi filter protects against EMI, the combination of these two countermeasures at circuit interfaces protects against both frequency and voltage related threats. Waveguides and spark-gap arrestors represent relatively old protection technologies that generally are not suitable for suppressing NEMP in digital, semiconductor-based devices. [10:2541] See also SYSTEM-GENERATED ELECTROMAGNETIC PULSE (SGEMP), INDUCED ELECTROMAGNETIC PULSE (IEMP).

NUCLEAR INTELLIGENCE (NUCINT) - Intelligence derived from the collection and analysis of radiation and other effects resulting from radioactive sources. [10:2764] NOTE: Nuclear Intelligence is a component of MEASUREMENT AND SIGNATURE INTELLIGENCE (MASINT).

NUCLEAR MICROBATTERY - See NUCLEAR MICROGENERATOR

NUCLEAR MICROGENERATOR - A MICROELECTROMECHANICAL (MEMS) device which converts high-energy beta particles to electricity. A radioactive source produces beta particles which strike and accumulate on a copper sheet. The electrostatic attraction between the copper sheet and radioactive source bends a silicon cantilever and the attached PIEZOELECTRIC plate. When the bent plate touches the radioactive source, the charge is neutralized and the resulting vibration of the plate generates an electric current. [10:3042] NOTE: Nuclear batteries, which can last for decades, pack energy in densities thousands of times greater than lithium-ion batteries.

NUCLEAR QUADRUPOLE RESONANCE (NQR) - A device used to detect land mines and illegal drugs. It emits a radio frequency (RF) pulse which can disturb the nuclear magnetization of nitrogen-based explosives, such as TNT. The disturbance in the nitrogen nuclei, in turn, produces a characteristic NQR signal, which can be recorded for analysis. The device reacts to the explosive and not to the metal case, shrapnel or other clutter as metal detectors used for de-mining do. [10:2674] NOTE: NQR may be ineffective against RF-shielded explosives.

NULKA - A hovering DECOY to protect vessels against antiship missiles. A tube-launched torpedo-shaped device about seven feet in length and six inches in diameter which, when deployed, hovers like a vertical pole controlled by three jets at the

bottom, with a deployed antenna at the top. The decoy is positioned a safe distance from the protected ship and can be made to move horizontally a ship-like speed. A shipboard fire control system determines the optimum position for the decoy. The NULKA contains an ELECTRONIC WARFARE package to lure attacking missiles away from the protected vessel. [10:2612]

NULL STEERING - To control, usually electronically, the direction at which a directional null appears in the radiation pattern of an operational antenna. [3]